ROBERT X. GAO

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SUMMARY

Robert Gao's research interests are in the areas of signal transduction mechanisms, mechatronic systems design, multi-resolution data analysis, and artificial intelligence/machine learning for improving the observability and control of manufacturing processes and product quality. His research has led to the inventions of novel sensing methods, design and experimental evaluation of multi-physics sensors, and AI-based data analytic methods for the monitoring and control of manufacturing processes (e.g., plastic injection molding, sheet metal stamping, microrolling, incremental sheet forming) and prediction of product quality system performance (e.g., aircraft engines, building HVAC, batteries). He has served as a PI/Co-PI of over 70 projects funded by federal/state agencies and the industry, and is the Thrust Lead for *Control, Intelligence, and Autonomy* of the NSF Engineering Research Center (ERC) for *Hybrid Autonomous Manufacturing, Moving from Evolution to Revolution* (HAMMER). He has published 3 books, over 450 technical papers (including over 200 journal articles), received 13 patents, and given more than 130 invited talks.

Prof. Gao is a leader in the manufacturing research community. He was appointed by the National Academies of Sciences, Engineering, and Medicine (NASEM) as a member of the committee for developing *Options for a National Plan for Smart Manufacturing* and chaired one of the three Workshops on *State-of-the-Art of Smart Manufacturing*. He served as the Chair of the *Collaborative Working Group on Artificial Intelligence in Manufacturing* (CWG-AI) of CIRP, the International Academy for Production Engineering, and Chair of the *Scientific Committee of the North American Manufacturing Research Institution* (NAMRI) of SME. He was also a member of the Digital Manufacturing Lead Expert Team on *Integrating Machines, Robots, Artificial Intelligence, and Forming Technologies*, organized by The Minerals, Metals & Materials Society (TMS) and sponsored by ONR. He served as a Guest Editor for a number of journals on AI and data science for manufacturing, including the *AI-based Monitoring in Smart Manufacturing* (IEEE/ASME Transactions on Mechatronics) and *Data Science-Enhanced Manufacturing* (ASME Journal of Manufacturing Science and Engineering). He was a Senior Editor of the IEEE/ASME *Transactions on Mechatronics*.

Prof. Gao's research contributions have been broadly recognized by his peers. He is an elected Fellow of ASME, SME, IEEE, and CIRP, and a Distinguished Fellow of IIAV, the International Institute of Acoustics and Vibration. He is a recipient of the ASME *Milton C. Shaw Manufacturing Research Medal*, ASME *Blackall Machine Tool and Gage Award*, SME *Eli Whitney Productivity Award*, IEEE Instrumentation and Measurement Society *Technical Award*, IEEE *Best Application in Instrumentation and Measurement Award*, ISFA (International Symposium for Flexible Automation) *Hideo Hanafusa Outstanding Investigator Award*, IEEE Transactions on Systems, Man, and Cybernetics' *Andrew P. Sage Best Transactions Paper Award*, multiple *Best Paper* awards, and an NSF *CAREER* award. He is a member of the Connecticut Academy of Science and Engineering and was a Distinguished Lecturer of two IEEE Societies.

As Department Chair, Prof. Gao has demonstrated leadership in promoting research, education, and diversity to advance a department of more than 20 faculty, 450 undergraduate and 120 graduate students. He provided a strategic vision and built a collegial, collaborative, and inclusive environment that values high quality classroom teaching and student mentoring while significantly improving the scholarly outcome and competitively funded research during a period of multiple faculty retirements and over 80% increase in undergraduate enrollment. Since assuming his position in early 2015, the department's annual journal publication has nearly doubled whereas the research expenditure has increased by 75%. More than half of the faculty, including women and underrepresented minority, have been hired under his leadership. He has also effectively mentored junior faculty colleagues to successfully launch their career, as evidenced in their receiving NSF CAREER and ONR/AFOSR YIP awards, on average every year since 2016. He led the department in successfully completing the ABET review in 2024.

Prof. Gao served on the Technical Advisory Board of the former Digital Manufacturing and Design Innovation Institute (DMDII, now called MxD) and Board of Trustees of the Ohio Aerospace Institute (OAI). He is a member of the ASME Mechanical Engineering Department Heads Executive Committee (MEDHEC) and is currently serving as the Secretary of the NAMRI/SME Board of Directors.

EDUCATION

1991	Ph.D., Mechanical Engineering, Technical University of Berlin (TU Berlin), Germany.
1985	M.S., Mechanical Engineering, Technical University of Berlin, Germany.
1982	B.S., Mechanical Engineering, Central Academy of Arts and Design, Beijing, China.

PROFESSIONAL EXPERIENCE

2/2015 -	Cady Staley Professor of Engineering and Chair, *Department of Mechanical and Aerospace Engineering*, Case Western Reserve University, Cleveland, OH.
2008-2015	Pratt & Whitney Chair Professor, *Department of Mechanical Engineering*, University of Connecticut, Storrs, CT.
2007-2008	Director, *Center for Biomedical Sensing and Signal Processing*, College of Engineering, University of Massachusetts, Amherst, MA.
2005-2008	Professor, *Department of Mechanical and Industrial Engineering*, University of Massachusetts, Amherst, MA.
2000-2005	Associate Professor, *Department of Mechanical and Industrial Engineering*, University of Massachusetts, Amherst, MA.
1995-2000	Assistant Professor, *Department of Mechanical and Industrial Engineering*, University of Massachusetts, Amherst, MA.
1992-1995	Assistant Professor, *Institute for Micromanufacturing*, and Adjunct Assistant Professor, *Department of Electrical Engineering*, LA Tech University, Ruston, LA.
1986-1991	Research Associate (Wissenschaftlicher Mitarbeiter), *Institute for Measurement and Control* (Institut fuer Mess- und Regelungstechnik), Technical University of Berlin, Germany.
1983-1985	Research Fellow, *German Academic Exchange Foundation* (DAAD), and Graduate Assistant, *Institute for Measurement and Control*, TU Berlin, Germany.

HONORS AND AWARDS

1) Outstanding Paper Award (*for the paper titled* "*Multi-sensor Fusion and Machine Learning-driven Sequence-to-Sequence Translation for Interpretable Process Signature Prediction in Machining*"), 52nd SME North American Manufacturing Research Conference (NAMRC 52), Knoxville, TN, 2024.

2) Milton C. Shaw Manufacturing Research Medal (*for significant contributions to the understanding of manufacturing process dynamics through multi-physics sensing and AI-driven data analytics*), American Society of Mechanical Engineers, 2023.

3) Andrew P. Sage Best Transactions Paper Award (*for the paper* "*WaveletKernelNet: An Interpretable Deep Neural Network for Industrial Intelligent Diagnosis*") IEEE Transactions on Systems, Man, and Cybernetics, 2023.

4) Highly Cited Research in the field of Engineering, Clarivate/Web of Science, 2023.

5) Elected Distinguished Fellow, The International Institute of Acoustics and Vibration (IIAV), 2022.

6) International Leader Award (*for promoting an inclusive culture of global citizenship by supporting international students, creating opportunities for students to broaden their world view and encouraging cross-cultural understanding*), Center for International Affairs, Case Western Reserve University, 2022.

7) Best Paper Award (*for the paper titled "Deep Learning for Smart Manufacturing: Methods and Applications"*), Journal of Manufacturing Systems, 2021.

8) Best Paper Award (*for the paper titled "Attention Mechanism-Incorporated Deep Learning for AM Part Quality Prediction"*), 53rd CIRP Conference on Manufacturing Systems, Chicago, IL, 2020.

9) Outstanding Paper Award (*for the paper titled "Transferable Two-stream Convolutional Neural Network for Human Action Recognition"*), 48th SME North American Manufacturing Research Conference (NAMRC 48), Cincinnati, OH, 2020.

10) Named one of The 20 Most Influential Professors in Smart Manufacturing, Society of Manufacturing Engineers (SME), 2020.

11) Best Application in Instrumentation and Measurement Award (*for research on multivariate sensor for in-situ monitoring of injection molding*), IEEE Instrumentation and Measurement Society, 2019.

12) Eli Whitney Productivity Award (*for distinguished accomplishments in improving capability within the broad concept of orderly production*), Society of Manufacturing Engineers, 2019.

13) Best Paper Award Finalist (*for the paper titled "Explainable Deep Convolutional Neural Network for rotary machine fault diagnosis in sustainable manufacturing"*), 26th CIRP Life Cycle Engineering (LCE) Conference, Purdue University, West Lafayette, IN, 2019.

14) Blackall Machine Tool and Gage Award (*for best current original paper published on ASME Journal of Manufacturing Science and Engineering, titled "Pressure and Draw-In Maps for Stamping Process Monitoring"*), American Society of Mechanical Engineers, 2018.

15) Hideo Hanafusa Outstanding Investigator Award (*for significant contributions to flexible automation through innovative sensing and advanced analytic methods*), International Symposium on Flexible Automation, 2018.

16) Best Paper Award Finalist (*Application* category, *for the paper titled "Deep Residual Network with Hybrid Dilated Convolution for Gearbox Fault Diagnosis"*), International Symposium on Flexible Automation, Kanazawa, Japan, 2018.

17) Outstanding Paper Award (*for the paper titled "A Virtual Sensing based Augmented Particle Filtering for Tool Condition Prognosis"*), 45th SME North American Manufacturing Research Conference (NAMRC 45), Los Angeles, CA, 2017.

18) Elected Fellow, International Academy for Production Engineering (CIRP), 2016.

19) Best Student Paper Award (*for the paper titled "Automated Performance Tracking for Heat Exchanger in HVAC"*), Faculty advisor and co-recipient, IEEE International Conference on Automation Science and Engineering (CASE), Gothenburg, Sweden, 2015.

20) Elected Fellow, Society of Manufacturing Engineers (SME), 2014.

21) Outstanding Presentation Award (*for the paper titled "Noninterference Identification of Rotating Blade Vibration"*), 12th International Conference on Vibration and Motion Control, Hokkaido, Japan, 2014.

22) Best Paper Award (*Application* category, *for the paper titled "Design and Evaluation of an Embedded Pressure Sensor for Microrolling Process Monitoring"*), International Symposium on Flexible Automation, Awaji Island, Japan, July, 2014.

23) Distinguished Lecturer, IEEE Instrumentation and Measurement Society, 2014-2017.

24) Best Student Paper Award Finalist (*for the paper titled "Particle Filter for Tool Wear Prediction"*), SME North American Manufacturing Research Conference, Detroit, MI, June, 2014.

25) IEEE Technical Award (*for significantly advancing the state-of-the-art in electrical capacitance tomography instrument design*), IEEE Instrumentation and Measurement Society, 2013.

26) Distinguished Lecturer, IEEE Electron Devices Society, 2008-2013.

27) Featured article, "Era of Discovery", *International Innovation*, North American issue, September, 2013.

28) Best Paper in Session Award (*for the paper titled "Pattern Classification Based on Sparse Representation"*), ASME Dynamic Systems and Control Conf., Fort Lauderdale, FL, October, 2012.

29) Best Paper Award (*Application* category, *for the paper titled "Viscosity Measurement in Injection Molding Using a Multivariate Sensor"*), International Symposium on Flexible Automation, St. Louis, MO, June, 2012.

30) Best Paper Award (*Industry Track, for the paper titled "Occupancy and Indoor Environment Quality Sensing for Smart Buildings"*), IEEE International Conference on Instrumentation and Measurement Technology, Graz, Austria, May, 2012.

31) <u>Outstanding Associate Editor Award</u>, IEEE Trans. on Instrumentation and Measurement, 2012.

32) <u>Research Excellence Award</u>, Department of Mechanical Engineering, Univ. of Connecticut, 2011.

33) <u>Philips Young Investigator Award</u> (PYIA), 2nd Prize, Faculty advisor, IEEE International Conference of the Engineering in Medicine and Biology Society, Boston, MA, August, 2011.

34) <u>Best Paper Award Finalist</u> (*Theory* category, *for the paper titled "3D Interpolation Techniques for Analysis of Contact Pressure on Tool-Workpiece Interfaces"*), International Symposium on Flexible Automation, Japan, 2010.

35) <u>Best Student Paper Award Finalist</u> (*for the paper titled "Design of a Wearable Multi-Sensor Systems for Physical Activity Assessment"*), IEEE/ASME International Conference on Advanced Intelligent Mechatronics, Montreal, Canada, July, 2010.

36) <u>SME Outstanding Student Research Award</u> (*Honorable Mention*), Faculty advisor, North American Manufacturing Research Conference, Kingston, Canada, May, 2010.

37) <u>ASME Manufacturing Student Design Competition Award</u> (*Finalist*), Faculty advisor, International Manufacturing Science and Engineering Conference (MSEC), Erie, PA, June, 2010.

38) <u>Elected Member</u>, Connecticut Academy of Science and Engineering (CASE), 2010.

39) <u>Pratt & Whitney Chair Professorship</u>, University of Connecticut, with successful evaluation of the first five-year term and renewal for the second term, August 2008 – January 2015.

40) <u>Elected Fellow</u>, Institute of Electrical and Electronic Engineers (IEEE), 2008.

41) <u>Outstanding Senior Engineering Faculty Award</u>, University of Massachusetts Amherst, 2007.

42) <u>Award for Outstanding Accomplishment in Research and Creative Activity</u> (Finalist), University of Massachusetts Amherst, 2007.

43) <u>Spirit Award</u>, Sensor-Integrated Long Cane, faculty advisor and PI, The Harold Grinspoon Charitable Foundation Entrepreneurship Initiatives, 2006.

44) <u>Elected Fellow</u>, American Society of Mechanical Engineers (ASME), 2006.

45) <u>Certificate of Appreciation</u>, World Tribology Congress Oversight Committee, 2005.

46) <u>Certificate of Appreciation</u>, ASME Dynamic Systems and Control Division, 2004.

47) <u>Distinguished Teaching Award nominee</u>, University of Massachusetts Amherst, 2004.

48) <u>Senior Research Fellow and Guest Researcher</u>, National Institute of Standards and Technology (NIST), Gaithersburg, MD, April - August, 2003.

49) <u>Featured presentation</u>, *Engineering Times*, published by the National Society of Professional Engineers, on sensors research, July 2003.

50) <u>Featured presentations</u>, various newspaper articles and radio station interviews in Massachusetts on sensor-related research, 2003.

51) <u>Appointed Adjunct Professor</u>, Northeastern University, China, 2002-2007.

52) <u>Senior Research Fellow and Guest Researcher</u>, *National Institute of Standards and Technology*, Gaithersburg, MD, June, 2001.

53) <u>Barbara H. and Joseph I. Goldstein Outstanding Junior Engineering Faculty Award</u>, University of Massachusetts, 1999.

54) <u>Distinguished Teaching Award nominee</u>, University of Massachusetts Amherst, 1998.

55) <u>Featured presentation</u>, "*AMT News*", *American Association for Manufacturing Technology*, for interdisciplinary research in sensors and integrated machine condition monitoring, May, 1998.

56) <u>Inaugural Best Student Paper Award</u> (for the paper titled "Smart Bearing Utilizing Embedded Sensors: Design Consideration"), *SPIE's International Symposium on Smart Structures and Materials*, 1997.

57) <u>Nominated</u> for the Annual Symposium on Frontiers of Engineering, organized by the *National Academy of Engineering*, 1997.

58) <u>Early CAREER Award</u>, National Science Foundation (NSF), 1996.

59) <u>Faculty Summer Research Award</u>, *LA Tech University*, 1994.

60) <u>DAAD Fellowship</u>, German Academic Exchange Agency, Germany, 1983-1985.

EDITORIAL POSITIONS

1) **Senior Editor:**
   - IEEE/ASME Transactions on Mechatronics, 2020-2024.
2) **Guest Editor**:
   - SME Journal of Manufacturing Systems, *Special Issue on Explainable and Trustworthy AI for Smart Manufacturing*, 2023-2024.
   - ASME Journal of Manufacturing Science and Engineering, *Special Issue on Physics-Informed Machine Learning for Advanced Manufacturing,* 2023-2024.
   - Robotics and Computer-Integrated Manufacturing, *Special Issue on Digitization and Servitization of Machine Tools in the Era of Industry 4.0*, 2022-2023.
   - Journal of Materials Processing Technology*, Special Issue on Artificial Intelligence in Advanced Manufacturing Processes (AiAMP),* 2021-2022.
   - IEEE/ASME Transactions on Mechatronics*, Focused Section on AI-based Monitoring in Smart Manufacturing,* 2019-2020.
   - ASME Journal of Manufacturing Science and Engineering*, Special Issue on Data Science-Enhanced Manufacturing,* 2016-2017.
   - Mathematical Problems in Engineering*, Special Issue on Cyber Physical Systems,* 2014-2015.
   - IEEE Transactions of Instrumentation and Measurement*, Special Issue on Built-in-Test,* 2004-2005.
   - ASME Journal of Dynamic Systems, Measurement, and Controls*, Special Section on Sensors,* 2004-2005.
   - IEEE Instrumentation and Measurement Magazine*,* 2001-2002.
3) **Associate Editor**:
   - ASME Journal of Manufacturing Science and Engineering*,* 2009 – 2015;
   - IFAC Mechatronics, International Federation of Automatic Control, 2008 – 2015;
   - IEEE Transactions on Instrumentation and Measurement, 2000 - 2008 and 2010 – 2013;
   - ASME Journal of Dynamic Systems, Measurement, and Controls, 2005 - 2008.
4) **Editorial Board Member:**
   - Robotics and Computer Integrated Manufacturing, 2018 – present.
   - International Journal of Computer Integrated Manufacturing, 2018 – present.
   - Nanomanufacturing and Nanometrology, 2017 – present.
   - Smart and Sustainable Manufacturing Systems, 2016 – present.
   - International Journal of Manufacturing Research, 2006 – present.
5) **Advisory Board Member**: Advanced Manufacturing Book Series, World Scientific Publisher, 2017 – present.
6) **Scientific Committee Member:** NAMRI/SME*,* 2000-2005 and 2008 – present.
7) **International Program Committee:** Journal of Metrology and Measurement Systems*,* Polish Academy of Sciences*,* 2008 – 2015.
8) **Book Co-Editor:** "Condition Monitoring and Control for Intelligent Manufacturing", L. Wang and R. Gao (Eds.), Springer Verlag, London, UK, 2006.
9) **International Editorial Advisory Board Member**: Chinese Journal of Mechanical Engineering*,* English Edition*,* 2008-2012.
10) **Editor**: Proceedings of the ASME International Mechanical Engineering Congress and Exposition, Symposium on Recent Development in Fracture Sensing and Analysis, Applied Mechanics Division, 1997.

BOOKS AND BOOK CHAPTERS

1) R. Gao and R. Yan, "Wavelet: Theory and Application for Manufacturing"
   - English edition: *Springer*, New York, Dordrecht, Heidelberg, London, ISBN 978-1-4419-

1544-3, 2011.
- Chinese edition: *Machinery Industry Press,* ISBN 978-7-111-61407-4, 2019.

2) L. Wang and R. Gao, "Condition Monitoring and Control for Intelligent Manufacturing", *Springer*, UK, ISBN 1-84628-268-3, 2006.

3) J. Zhang, S. Liu, L. Wang, and R. Gao, "Efficient Data Management for Intelligent Manufacturing", in *Advances in Manufacturing from Industry 4.0 to Industry 5.0* (Ed. D. Mourtzis), *Elsevier*, 2024.

4) S. Liu, J. Zhang, S. Yi, R. Gao, and L. Wang, "Human-Centric Systems in Smart Manufacturing", in *Advances in Manufacturing from Industry 4.0 to Industry 5.0* (Ed. D. Mourtzis), *Elsevier*, 2024.

5) J. Wang and R. Gao, "Innovative Smart Scheduling and Predictive Maintenance Techniques", in *Design and Operation of Production Networks for Mass Personalization in the Era of Cloud Technology* (Ed. D. Mourtzis), *Elsevier*, ISBN 978-0-12-823657-4, pp. 181-207, 2021.

6) R. Gao, L. Wang, P. Wang, J. Zhang, and H. Liu, "Human Motion Recognition and Prediction for Robot Control", in *Advanced Human-Robot Collaboration in Manufacturing* (Ed. L. Wang, et al.), ISBN978-3-030-69177-6, *Springer Nature,* Switzerland, pp. 261-282, 2021.

7) R. Gao, P. Wang, and R. Yan, "Machine Tool Prognosis for Precision Manufacturing", in Precision Manufacturing: Metrology (Ed. W. Gao), *Springer*, ISBN 978-981-10-4937-8, 2019.

8) R. Gao and P. Wang, "Sensors to Control Processing and Improve Lifetime and Performance for Sustainable Manufacturing", in *Encyclopedia of Sustainable Technologies*, *Elsevier*, (ed. M. Abraham), ISBN 9780128046777, pp. 447-462, 2017.

9) S. Liu and R. Gao, "Multisensor Data Fusion: Architecture Design and Application in Physical Activity Assessment", in *Multisensor Data Fusion: From Algorithm and Architecture design to Applications* (Eds. H. Fourati and K. Iniewski), *CRC Press*, ISBN 9780367656287, 2015.

10) Z. Fan, R. Gao, and J. Wang, "Virtual Instrumentation for Electrical Capacitance Tomography", in *LabView*: *Practical Applications and Solutions*, *InTech*, ISBN 978-953-307-650-8, 2011.

11) D. Ball, R. Yan, R. Gao, and A. Deshmukh, "Inferencing in Large Scale Sensor Networks", in *Recent Advances in Maintenance and Infrastructure Management* (Eds. R. Cigolini, A. Deshmukh, L. Fedele, and S. McComb), *Springer Verlag*, ISBN 1-84882-488-1, March, 2009.

12) R. Gao and S. Sheng, "Non-Destructive Testing for Bearing Condition Monitoring and Health Diagnosis", in *Ultrasonic and Advanced Methods for Nondestructive Testing and Material Characterization* (Ed. C.H. Chen), *World Scientific Publishing*, pp. 439-470, ISBN-13 978-981-270-409-2, 2007.

13) R. Gao, R. Yan, S. Sheng, and L. Zhang, "Sensor Placement and Signal Processing for Bearing Condition Monitoring", in *Condition Monitoring and Control for Intelligent Manufacturing*, *Springer Verlag* (Eds. L. Wang and R. Gao), pp. 167-191, UK, 2006.

14) R. Gao, "Neural Networks for Machine Condition Monitoring and Fault Diagnosis", in *Neural Networks for Instrumentation, Measurement, and Related Industrial Applications* (eds. S. Ablameyko et al., ISBN 1387-6694), *IOS Press*, pp. 167-188, Amsterdam, The Netherlands, 2003.

PATENTS

1) R. Gao, J. Wang, R. Yan, B. Ellis, B. Smith, and J. Sanchez, "Method and System for Testing Operational Integrity of a Drilling Rig", International Patent, Canada Patent No. 2,875,071, March 31, 2020.

2) R. Gao, J. Wang, R. Yan, B. Ellis, B. Smith, and J. Sanchez, "Methods and Apparatus for Defect Diagnosis in a Mechanical System", U.S. Patent No. 10,520,397, December 31, 2019.

3) R. Gao, J. Wang, R. Yan, B. Ellis, B. Smith, and J. Sanchez, "Methods and Apparatus for Defect Diagnosis in a Mechanical System", International Patent (Mexico), MX Patent No. 351680, October 25, 2017.

4) R. Gao, J. Wang, R. Yan, B. Ellis, B. Smith, and J. Sanchez, "Methods and System for Testing Operational Integrity of a Drilling Rig", International Patent, Mexico Patent No. 343293, November 1, 2016.

5) R. Gao, Z. Fan, and J. Cao, "Methods and Apparatus for Monitoring Microrolling Processes Using Embedded Sensing", U.S. Patent No. 9,500,540, November 22, 2016.

6) R. Gao, Z. Fan, and D. Kazmer, "Method and System for Multivariate Remote Monitoring of Polymer Processing", U.S. Patent No. 9,446,544, September 20, 2016.

7) Z. Fan, R. Gao, J. Lovett, and L. Smith, "Multiple-Excitation Multiple-Receiving (MEMR) Capacitance Tomography", U.S. Patent No. 9,170,224, October, 2015.

8) R. Gao and S. Sah, "A Self-Energized Wireless Sensor and Method Using Magnetic Field Communication", U.S. Patent No. 8,971,801, March, 2015.

9) R. Gao and Z. Fan, "Multiple Excitation Capacitance Polling for Enhanced Electronic Capacitance Tomography", U.S. Patent No. 8,762,084, June 24, 2014.

10) R. Gao and R. Yan, "Multi-Scale Enveloping Spectrogram for Machine Condition Monitoring and Health Diagnosis", U.S. Patent No. 7,602,985, October 13, 2009.

11) R. Gao and S. Sovenyi, "System and Method for Piezoelectric Load Sensing", U.S. Patent No. 7,104,139, September 12, 2006.

12) S. Malkin, R. Gao, C. Guo, B. Varghese, and S. Pathare, "Grinding Wheel System", U.S. Patent No. 6,985,791, January 10, 2006.

13) S. Malkin, R. Gao, C. Guo, B. Varghese, and S. Pathare, "Grinding Wheel System", U.S. Patent No. 6,602,109, August 5, 2003.

JOURNAL ARTICLES

1) R. Gao, J. Krüger, M. Merklein, H. Möhring, and J. Váncza, "Artificial Intelligence in manufacturing: state of the art, perspectives, and future directions", *CIRP Annals – Manufacturing Technology*, Vol. 73, No. 2, pp. 723-749, July, 2024.

2) P. Wang, J. Karigiannis, and R. Gao, "Ontology-integrated tuning of Large Language Model for intelligent maintenance", *CIRP Annals – Manufacturing Technology*, Vol. 73, No. 1, pp. 361-364, June, 2024.

3) S. Liu, J. Zhang, L. Wang, and R. Gao, "Vision AI-based human-robot collaborative assembly driven by autonomous robots", *CIRP Annals – Manufacturing Technology*, Vol. 73, No. 1, pp. 13-16, April, 2024.

4) C. Cooper, J. Zhang, I. Ragai, and R. Gao, "Multi-sensor fusion and machine learning-driven sequence-to-sequence translation for interpretable process signature prediction in machining", *Journal of Manufacturing Systems*, Vol. 75, pp. 288-298, June, 2024.

5) V. Karkaria, A. Goeckner, R. Zha, J. Chen, J. Zhang, Q. Zhu, J. Cao, R. Gao, and W. Chen, "Towards a Digital Twin framework in additive manufacturing: machine learning and Bayesian optimization for time series process optimization", *Journal of Manufacturing Systems*, Vol. 75, pp. 322-332, June, 2024.

6) Y. Wang, Z. Zhou, L. Yang, R. Gao and R. Yan, "Wavelet-driven differentiable architecture search for planetary gear fault diagnosis", *Journal of Manufacturing Systems*, Vol. 74, pp. 587-593, June, 2024.

7) X. Li, V. Krivtsov, C. Pan, A. Nassehi, R. Gao, and D. Ivanov, "End-to-end supply chain resilience management using deep learning, survival analysis, and explainable artificial intelligence", *International Journal of Production Research*, pp. 1-27, June, 2024.

8) L. Hu, H. Phan, S. Srinivasan, C. Cooper, J. Zhang, B. Yuan, R. Gao, and Y. Guo, "Multimodal data-driven machine learning for the prediction of surface topography in end milling", *Production Engineering*, Vol. 18, pp. 507-523, January, 2024.

9) L. Xia, P. Zheng, J. Li, X. Huang, and R. Gao, "Histogram-Based Gradient Boosting Tree: A Federated Learning approach for collaborative fault diagnosis", *IEEE Transactions on Mechatronics*, November 2023.

10) C. Cooper, J. Zhang, and R. Gao, "Error homogenization in physics-informed neural networks for modeling in manufacturing", *Journal of Manufacturing Systems*, Vol. 71, pp. 298-308, September 2023.

11) S. Liu, L. Wang, and R. Gao, "Cognitive neuroscience and robotics: advancements and future research directions", *Robotics and Computer-Integrated Manufacturing*, Vol. 85, paper No. 102610, July 2023.

12) Z. Fan, R. Gao, Q. He, Y. Huang, T. Jiang, Z. Peng, L. Thevenaz, Y. Xiong, and S. Zhong, "New sensing technologies for monitoring machinery, structures, and manufacturing processes", *Journal of Dynamics, Monitoring, and Diagnostics*, Infoscience, EPFL, Vol. 2, No. 2, pp. 69-88, June 2023.

13) R. Yan, Z. Shang, H. Xu, J. Wen, Z. Zhao, X. Chen, and R. Gao, "Wavelet transform for rotary machine fault diagnosis: ten years revisited", *Mechanical Systems and Signal Processing*, Vol. 200, paper No. 110545, June 2023.

14) C. Cooper, J. Zhang, Y. Guo, and R. Gao, "Surface roughness prediction through GAN-synthesized power signal as a process signature", *Journal of Manufacturing Systems*, Vol. 68, pp. 660-669, June 2023.

15) J. Zhang, S. Liu, R. Gao, and L. Wang, "Neural rendering-enabled 3D modeling for rapid digitization of in-service products", *CIRP Annals – Manufacturing Technology*, Vol. 63, No. 1, June 2023.

16) C. Cooper, J. Zhang, J. Huang, S. Wolff, J. Cao, and R. Gao, "Tensile strength prediction in directed energy deposition through physics-informed machine learning and Shapley additive explanations", *Journal of Materials Processing Technology*, Vol. 315, No. 117908, February 2023.

17) J. Wang, X. Niu, R. Gao, Z. Huang, and R. Xue, "Digital twin-driven virtual commissioning of machine tool", *Robotics and Computer-Integrated Manufacturing*, Vol. 81, No. 102499, November 2022.

18) Z. Fan, X. Hu, and R. Gao, "Indirect measurement methods for quality and process control in nano-manufacturing", *Nanomanufacturing and Metrology*, Vol. 5, No. 3, pp. 209-229, September 2022.

19) C. Cooper, J. Zhang, L. Hu, Y. Guo, and R. Gao, "Texture-aware ridgelet transform and machine learning for surface roughness prediction", *IEEE Transactions on Instrumentation and Measurement*, Vol. 71, No. 2520110, September 2022.

20) J. Wang, J. Sun, W. Ge, F. Zhang, and R. Gao, "Virtual sensing for online fault diagnosis of heat exchangers", *IEEE Transactions on Instrumentation and Measurement*, Vol. 71, 9508708, July 2022.

21) L. Xia, P. Zheng, X. Li, R. Gao, and L. Wang, "Toward cognitive predictive maintenance: a survey of graph-based approaches", *Journal of Manufacturing Systems*, Vol. 64, pp. 107-120, June 2022.

22) J. Zhang, C. Liu, and R. Gao, "Physics-guided Gaussian Process for HVAC system performance prognosis", *Mechanical Systems and Signal Processing*, Vol. 179, No. 109336, May 2022.

23) J. Wang, P. Fu, S. Ji, Y. Li, and R. Gao, "A light weight multi-sensory fusion model for induction motor fault diagnosis", *IEEE/ASME Transactions on Mechatronics*, pp. 1-10, April 2022.

24) P. Wang, J. Kershaw, M. Russell, J. Zhang, Y. Zhang, and R. Gao, "Data-driven process characterization and adaptive control in robotic arc welding", *CIRP Annals – Manufacturing Technology*, Vol. 71, No. 1, pp. 1-4, April 2022.

25) J. Wang, Y. Li, R. Gao, and F. Zhang "Hybrid physics-based and data-driven models for smart manufacturing: modelling, simulation, and explainability", *Journal of Manufacturing Systems*, Vol. 63, pp. 381-391, April 2022.

26) T. Li, Z. Zhao, C. Sun, L. Cheng, X. Chen, R. Yan, and R. Gao, "WaveletKernelNet: an interpretable deep neural network for industrial intelligent diagnosis", *IEEE Transactions on Systems, Man and Cybernetics: Systems*, Vol. 52, No. 4, pp. 2302-2312, April 2022.

27) J. Zhou, L. Zheng, Y. Wang, C. Wang, and R. Gao, "Automated model generation for machinery fault diagnosis based on reinforcement learning and neural architecture search", *IEEE Transactions on Instrumentation and Measurement*, Vol. 71, paper # 3501512, January 2022.

28) S. Guo, M. Agarwal, C. Cooper, Q. Tian, R. Gao, G. Guo, and Y. Guo, "Machine learning for metal additive manufacturing: towards a physics-informed data-driven paradigm", *Journal of Manufacturing Systems*, Vol. 62, pp. 145-163, January 2022.

29) D. Iakovidis, M. Ooi, Y. Kuang, S. Demidenko, ... D. Wang, J. Zhang, and R. Gao, "Roadmap on signal processing for next generation measurement systems", *Measurement Science and Technology*, Vol. 33, pp. 1-48, November 2021.

30) Y. Li, J. Wang, Z. Huang, and R. Gao, "Physics-informed meta learning for machining tool wear prediction", *Journal of Manufacturing Systems*, Vol. 62, pp. 17-27, October 2021.

31) L. Wang, S. Liu, C. Cooper, X. Wang, and R. Gao, "Function block-based human-robot collaborative assembly driven by brainwaves", *CIRP Annals – Manufacturing Technology*, Vol. 70, No. 1, pp. 5-8, August 2021.

32) J. Huang, J. Zhang, Q. Chang, and R. Gao, "Integrated process-system modeling and control through graph neural network and reinforcement learning", *CIRP Annals – Manufacturing Technology*, Vol. 70, No. 1, pp. 377-380, August 2021.

33) Y. Wang, L. Deng, L. Zheng, and R. Gao, "Temporal convolutional network with soft thresholding and attention mechanism for machinery prognostics", *Journal of Manufacturing Systems*, Vol. 60, pp. 512-526, July 2021.

34) J. Zhang and R. Gao, "Deep Learning-driven data curation and model interpretation for smart manufacturing", *Chinese Journal of Mechanical Engineering*, 34:71, pp. 1-21, 2021.

35) J. Zhang, P. Wang, and R. Gao, "Hybrid machine learning for human action recognition and prediction in assembly", *Robotics and Computer-Integrated Manufacturing*, Vol. 72, No. 102184, pp. 1-10, 2021.

36) P. Wang, R. Gao, and W. Woyczynski, "Lévy process-based stochastic modeling for machine performance degradation prognosis", *IEEE Transactions on Industrial Electronics*, Vol. 68, No. 12, pp. 12760-12770, December, 2020.

37) J. Arinez, Q. Chang, R. Gao, C. Xu, and J. Zhang, "Artificial intelligence in advanced manufacturing: current status and future outlook", *ASME Journal of Manufacturing Science and Engineering*, Vol. 142, 110804-1-16, November, 2020.

38) H. Ding, R. Gao, A. Isaksson, R. Landers, T. Parisini, and Y. Yuan, "State of AI-Based Monitoring in Smart Manufacturing and Introduction to Focused Section", *IEEE/ASME Transactions on Mechatronics*, Vol. 25, No. 5, pp. 2143-2154, October, 2020.

39) J. Wang, Y. Li, R. Zhao, and R. Gao, "Physics-guided neural network for machining tool wear prediction", *Journal of Manufacturing Systems*, Vol. 57, pp. 298-310, October, 2020.

40) R. Gao, L. Wang, M. Helu, and R. Teti, "Big data analytics for smart factories of the future", *CIRP Annals – Manufacturing Technology*, Vol. 69, No. 2, pp. 668-692, August, 2020.

41) J. Zhang, H. Liu, Q. Chang, L. Wang, and R. Gao, "Recurrent neural network for motion trajectory prediction in human robot collaborative assembly", *CIRP Annals – Manufacturing Technology*, Vol. 69, No. 1, pp. 9-12, August, 2020.

42) P. Wang and R. Gao, "Transfer learning for enhanced machine fault diagnosis in manufacturing", *CIRP Annals – Manufacturing Technology*, Vol. 69, No. 1, pp. 413-416, August, 2020.

43) S. Shao, R. Yan, Y. Lu, P. Wang, and R. Gao, "DCNN-based multi-signal induction motor fault diagnosis", *IEEE Transactions on Instrumentation and Measurement*, Vol. 69, No. 6, pp. 2658-2669, June, 2020.

44) C. Sun, S. Tian, X. Chen, R. Yan, and R. Gao, "Composite graph-based sparse subspace clustering for machine fault diagnosis", *IEEE Transactions on Instrumentation and Measurement*, Vol. 69, No. 5, pp. 1850-1859, April, 2020.

45) Q. Xiong, J. Zhang, P. Wang, D. Liu, and R. Gao, "Transferable two-stream convolutional neural network for human action recognition", *Journal of Manufacturing Systems*, Vol. 56, pp. 605-614, April, 2020.

46) P. Fu, J. Wang, X. Zhang, L. Zhang, and R. Gao, "Dynamic routing-based multimodal neural network for multi-sensory fault diagnosis of induction motor", *Journal of Manufacturing Systems*, Vol. 55, pp. 264-272, April, 2020.

47) H. Wang, J. Xu, R. Yan, and R. Gao, "A new intelligent bearing fault diagnosis method using SDP representation and SE-CNN", *IEEE Transactions on Instrumentation and Measurement*, Vol. 69, No. 5, pp. 2377-2389, May, 2020.

48) J. Grezmak, J. Zhang, P. Wang, K. Loparo, and R. Gao, "Interpretable convolutional neural network through layer-wise relevance propagation for machine fault diagnosis", *IEEE Sensors Journal*, Vol. 20, No. 6, pp. 3172-3181, March, 2020.

49) D. Zhao, W. Cheng, R. Gao, R. Yan, and P. Wang, "Generalized Vold-Kalman filtering for time-varying nonstationary compound faults features extraction of bearing and gearbox", *IEEE Transactions on Instrumentation and Measurement*, Vol. 69, No. 2, February, 2020.

50) J. Wang, R. Zhao, and R. Gao, "Probabilistic transfer factor analysis for machinery autonomous diagnosis cross various operating conditions", *IEEE Transactions on Instrumentation and Measurement*, Vol. 69, No. 8, pp. 5335-5344, January, 2020.

51) D. Zhao, T. Wang, R. Gao, and F. Chu, "Signal optimization based generalized demodulation transform for rolling bearing nonstationary fault characteristic extraction", *Mechanical Systems and Signal Processing*, Vol. 134, pp. 1-17, December, 2019.

52) F. Zhang, J. Yan, P. Fu, J. Wang, and R. Gao, "Ensemble sparse supervised model for bearing fault diagnosis in smart manufacturing", *Robotics and Computer-Integrated Manufacturing*, Vol. 65, paper #101920, pp. 1-11, December, 2019.

53) J. Wang, P. Fu, L. Zhang, R. Gao, and R. Zhao, "Multilevel information fusion for induction motor fault diagnosis", *IEEE/ASME Transactions on Mechatronics*, Vol. 24, No. 5, pp. 2139-2150, October, 2019.

54) J. Wang, R. Gao, Z. Yuan, Z. Fan, and L. Zhang, "A joint particle filter and expectation maximization approach to machine condition prognosis", *Journal of Intelligent Manufacturing*, Vol. 30, No. 2, pp. 605–621, October, 2019.

55) J. Cao, E. Brinksmeier, M. Fu, R. Gao, B. Liang, M. Merklein, M. Schmidt, and J. Yaganimoto, "Manufacturing of advanced and smart tooling for metal forming", *CIRP Annals-Manufacturing Technology*, Vol. 68, No. 2, pp. 605-628, August, 2019.

56) L. Wang, R. Gao, J. Vancza, J. Krueger, X. Wang, S. Makris, and G. Chryssolouris, "Symbiotic human-robot collaborative assembly", *CIRP Annals-Manufacturing Technology*, Vol. 68, No. 2, pp. 701-726, August, 2019.

57) P. Wang, Z. Liu, R. Gao, and Y. Guo, "Heterogeneous data-driven hybrid machine learning for tool condition prognosis", *CIRP Annals-Manufacturing Technology*, Vol. 68, No. 1, pp. 455-458, August, 2019.

58) A. Caggiano, J. Zhang, V. Alfieri, F. Caiazzo, Z. Liu, R. Gao, and R. Teti, "Machine learning-based image processing for on-line defect recognition in additive manufacturing", *CIRP Annals-Manufacturing Technology*, Vol. 68, No. 1, pp. 451-454, August, 2019.

59) J. Wang, Y. Liang, Y. Zheng, R. Gao, and F. Zhang, "An integrated fault diagnosis and prognosis approach for predictive maintenance of wind turbine bearing with limited samples", *Renewable Energy*, Vol. 145, pp. 642-650, June, 2019.

60) J. Wang, J. Yan, C. Li, R. Gao, and R. Zhao, "Deep heterogeneous GRU model for predictive analytics in smart manufacturing: application to tool wear prediction", *Computers in Industry*, Vol. 111, pp. 1-14, June, 2019.

61) L. Mo, L. Zeng, S. Liu, and R. Gao, "Multi-sensor activity monitoring combination of models with class-specific voting weights", *Information*, Vol. 10, No. 917, pp. 1-15, June, 2019.

62) P. Cao, Z. Fan, R. Gao, and J. Tang, "Harnessing multi-objective simulated annealing toward configuration optimization within compact space for additive manufacturing", *Robotics and Computer-Integrated Manufacturing*, Vol. 57, pp. 29-45, June, 2019.

63) X. Zhang, H. Zhang, J. Gao, J. Liu, R. Gao, H. Cao, and X. Chen, "Discrete time-delay optimal control method for experimental active chatter suppression and its closed-loop stability analysis", *ASME Journal of Manufacturing Science and Engineering*, Vol. 141, pp. 051003-1-13, May, 2019.

64) J. Wang, P. Fu, and R. Gao, "Machine vision intelligence for product defect inspection based on deep learning and Hough transform", *Journal of Manufacturing Systems*, Vol. 51, pp. 52-60, March, 2019.

65) R. Zhao, R. Yan, Z. Chen, K. Mao, P. Wang, and R. Gao, "Deep learning and its applications to machine health monitoring", *Mechanical Systems and Signal Processing*, vol. 115, pp. 213-237, January, 2019.

66) C. Sun, P. Wang, R. Yan, R. Gao, and X. Chen, "Machine health monitoring based on locally linear embedding with kernel sparse representation for neighborhood optimization", *Mechanical Systems and Signal Processing*, Vol. 114, pp. 25-34, January, 2019.

67) J. Zhang, P. Wang, and R. Gao, "Deep learning-based tensile strength prediction in fused deposition modeling", *Computers in Industry*, Vol. 107, pp. 11-21, January, 2019.

68) J. Wang, L. Ye, R. Gao, C. Li, and L. Zhang, "Digital Twin for rotating machinery fault diagnosis in smart manufacturing", *International Journal of Production Research*, Vol. 57, No. 12, pp. 3920-3934, December, 2018.

69) X. Zhang, Y. He, R. Gao, J. Geng, X. Chen, and J. Xiang, "Construction and application of multivariable wavelet finite element for flat shell analysis", *Acta Mechanica Solida Sinica*, Vol. 31, No. 4, pp. 391-404, August, 2018.

70) P. Cao, Z. Fan, R. Gao, and J. Tang, "Design for additive manufacturing: optimization of piping network in compact system with enhanced path-finding approach", *ASME Journal of Manufacturing Science and Engineering*, Vol. 140, 0810113-1-15, August, 2018.

71) P. Wang, H. Liu, L. Wang, and R. Gao, "Deep learning-based human motion recognition for predictive context-aware human-robot collaboration", *CIRP Annals-Manufacturing Technology*, Vol. 67, No. 1, pp. 17-20, August, 2018.

72) J. Zhang, P. Wang, R. Yan, and R. Gao, "Long short-term memory for machine remaining life prediction", *Journal of Manufacturing Systems*, Vol. 48, pp. 78-86, July, 2018.

73) D. Wu, C. Jennings, J. Terpenny, S. Kumara, and R. Gao, "Cloud-based parallel machine learning for tool wear prediction", *ASME Journal of Manufacturing Science and Engineering*, Vol. 140, 041005-1-10, April, 2018.

74) J. Wang, Y. Ma, L. Zhang, R. Gao, and D. Wu, "Deep learning for smart manufacturing: methods and applications", *Journal of Manufacturing Systems*, Vol. 48, Part C, pp. 144-156, January, 2018.

75) L. Barry, L. Hatchman, Z. Fan, J. Guralnik, R. Gao, and G. Kuchel, "Design and validation of a RFID-based device for routinely assessing gait speed in a geriatrics clinic", *Journal of the American Geriatrics Society*, pp. 8614-8618, January, 2018.

76) P. Wang, Z. Fan, D. Kazmer, and R. Gao, "Orthogonal analysis of multi-sensor data fusion for improved quality control", *ASME Journal of Manufacturing Science and Engineering*, Vol. 139, 101008-1–8, October, 2017.

77) S. Shao, W. Sun, R. Yan, P. Wang, and R. Gao, "A deep learning approach for fault diagnosis of induction motors in manufacturing", *Chinese Journal of Mechanical Engineering*, Vol. 30, No. 6, pp. 1347-1356, October, 2017.

78) J. Wang, Y. Zheng, P. Wang, and R. Gao, "A virtual sensing based augmented particle filtering for tool condition prognosis", *Journal of Manufacturing Processes*, Vol. 28, pp. 472-478, August, 2017.

79) X. Zhang, R. Gao, R. Yan, X. Chen, C. Sun, and Z. Yang, "Analysis of laminated plates and shells using B-Spline wavelet on interval finite element", *International Journal of Structural Stability and Dynamics*, Vol. 17, No. 6, pp. 1750062-1-18, August, 2017.

80) G. Gordon, D. Kazmer, X. Tang, Z. Fan, and R. Gao, "Validation of an in-mold multivariate sensor for measurement of melt temperature, pressure, velocity, and viscosity", *International Polymer Processing*, Vol. 32, No. 4, pp. 406-415, August, 2017.

81) P. Wang, R. Gao, and R. Yan, "A deep learning-based approach to material removal rate prediction in polishing", *CIRP Annals-Manufacturing Technology*, Vol. 66, No. 1, pp. 429-432, August, 2017.

82) P. Wang, Ananya, R. Yan, and R. Gao, "Virtualization and deep recognition for system fault classification", *Journal of Manufacturing Systems*, Vol. 44, pp. 310-316, July, 2017.

83) P. Wang and R. Gao, "Automated performance tracking for heat exchangers in HVAC", *IEEE Transactions on Automation Science and Engineering*, Vol. 14, No. 2, pp. 634-645, April, 2017.

84) J. Wang, L. Zhang, L. Duan, and R. Gao, "A new paradigm of cloud-based predictive maintenance for intelligent manufacturing", *Journal of Intelligent Manufacturing*, Vol. 28, No. 5, pp.

1125-1137, March, 2017.

85)   D. Wu, C. Jennings, J. Terpenny, R. Gao, and S. Kumara, "A comparative study on machine learning algorithms for smart manufacturing: tool wear prediction using random forest", *ASME Journal of Manufacturing Science and Engineering*, Vol. 139, No. 7, pp. 0710-0718, March, 2017.

86)   D. Wu, S. Liu, L. Zhang, J. Terpenny, R. Gao, T. Kurfess, and J. Guzzo, "A fog computing-based framework for process monitoring and prognosis in cyber-manufacturing", *Journal of Manufacturing Science and Engineering*, Vol. 43, pp. 25-34, February, 2017.

87)   Y. Qian, R. Yan, and R. Gao, "A multi-time scale approach to remaining useful life prediction in rolling bearing", *Mechanical Systems and Signal Processing*, Vol. 83, pp. 549-567, January, 2017.

88)   J. Wang, X. Tang, R. Gao, L. Duan, and L. Zhang, "On ultrasonic communication through metal structure for machine embedded sensing", *Measurement*, Vol. 94, pp. 653-662, September, 2016.

89)   W. Wen, R. Gao, and W. Cheng, "Planetary gearbox fault diagnosis using envelop manifold demodulation", *Shock and Vibration*, Vol. 2016, paper # 3952325, pp. 1-13, 2016.

90)   X. Zhang, R. Gao, R. Yan, X. Chen, C. Sun and Z. Yang, "Multivariable wavelet finite element-based vibration model for quantitative crack identification by using particle swarm optimization", *Journal of Sound and Vibration*, Vol. 375, No. 4, pp. 200-216, August, 2016.

91)   G. Mendible, D. Kazmer, R. Gao, and S. Johnston, "Estimation of bulk melt-temperature from in-mold thermal sensors for injection molding, Part B: Validation", *International Polymer Processing*, Vol. 31, No. 3, pp. 278-284, July, 2016.

92)   S. Sah, N. Mahayotsanun, M. Peshkin, J. Cao, and R. Gao, "Pressure and draw-in maps for stamping process monitoring", *ASME Journal of Manufacturing Science and Engineering*, Vol. 138, No. 9, pp. 091005-1-15, June, 2016.

93)   P. Wang and R. Gao, "Markov nonlinear system estimation for engine performance tracking", *ASME Journal of Engineering for Gas Turbine and Power*, Vol. 138, No. 9, pp. 091201, March, 2016.

94)   X. Zhang, R. Gao, R. Yan, X. Chen, C. Sun and Z. Yang, "B-spline wavelet on interval finite element method for static and vibration analysis of stiffened flexible thin plate", Computers, Materials & Continua, Vol. 52, No. 1, pp. 53-71, March, 2016.

95)   X. Zhang, C. Wang, R. Gao, R. Yan, X. Chen and S. Wang, "A novel hybrid error criterion-based active control method for on-line milling vibration suppression with piezoelectric actuators and sensors", *Sensors*, Vol. 16, Issue 1, paper #68, pp. 1-12, January, 2016.

96)   P. Wang and R. Gao, "Adaptive resampling-based particle filtering for tool life prediction", *Journal of Manufacturing Systems*, Vol. 37, No. 2, pp. 528-534, October, 2015.

97)   R. Yan, R. Gao and L. Zhang, "In-process modal parameter identification for spindle health monitoring", *Mechatronics*, Vol. 31, pp. 42-49, October 2015.

98)   G. Gordan, D. Kazmer, X. Tang, Z. Fan, and R. Gao, "In-mold multivariate sensing of colored polystyrene", *Polymer Engineering and Science*, Vol 55, No. 12, pp. 2794-2800, September, 2015.

99)   R. Gao, L. Wang, R. Teti, D. Dornfeld, S. Kumara, M. Mori, and M. Helu, "Cloud-enabled prognosis for manufacturing", *CIRP Annals – Manufacturing Technology*, Vol. 64, No. 2, pp. 749-772, August, 2015.

100) P. Wang, R. Gao, and Z. Fan, "Cloud computing for cloud manufacturing: benefits and limitations", *ASME Journal of Manufacturing Science and Engineering*, Vol. 137, 040901-1-9, August, 2015.

101) M. Ng, L. Li, Z. Fan, R. Gao, E. Smith, K. Ehmann, and J. Cao, "Joining sheet metals by electrically-assisted roll bonding", *CIRP Annals – Manufacturing Technology*, Vol. 64, pp. 273-276, August, 2015.

102) S. Johnston, G. Mendible, R. Gao, and D. Kazmer, "Estimation of bulk melt-temperature from in-mold thermal sensors for injection molding, Part A: Method", *International Polymer Processing*, Vol. 30, No. 4, pp. 460-466, August, 2015.

103) Z. Fan, X. Zou, R. Gao, M. Ng, J. Cao, and E. Smith, "Embedded capacitive pressure sensing for

electrically assisted microrolling", *IEEE/ASME Transactions on Mechatronics*, Vol. 20, No. 3, pp. 1005-1014, June, 2015.

104) D. Kazmer, G. Gordon, G. Mendible, S. Johnston, X. Tang, Z. Fan, and R. Gao, "A multivariate sensor for intelligent polymer processing", *IEEE/ASME Transactions on Mechatronics*, Vol. 20, No. 3, pp. 1015-1023, June, 2015.

105) G. Gordon, D. Kazmer, X. Tang, Z. Fan, and R. Gao, "Quality control using a multivariate injection molding sensor", *International Journal of Advanced Manufacturing Technology*, Vol. 78, pp. 1381-1391, June, 2015.

106) P. Wang, D. Karg, R. Gao, Z. Fan, K. Kwolek, and A. Consiglio, "Non-contact identification of rotating blade vibration", *JSME Mechanical Engineering Journal*, Vol. 2, No. 3, pp. 1-12, June, 2015.

107) J. Wang, P. Wang, and R. Gao, "Enhanced particle filter for tool wear prediction", *Journal of Manufacturing Systems*, Vol. 36, pp. 35-45, March, 2015.

108) X. Zou, Z. Fan, R. Gao, and J. Cao, "An integrative approach to spatial mapping of pressure distribution in microrolling", *CIRP Journal of Manufacturing Science and Technology*, Vol. 9, pp. 107-115, January, 2015.

109) R. Gao, X. Tang, G. Gordon, and D. Kazmer, "Online product quality monitoring through in-process measurement", *CIRP Annals – Manufacturing Technology*, Vol. 63(1), pp. 493-496, August, 2014.

110) M. Ng, Z. Fan, R. Gao, E. Smith, and J. Cao, "Characterization of electrically-assisted micro-rolling for surface texturing using embedded sensor", *CIRP Annals – Manufacturing Technology*, Vol. 63(1), pp. 269-272, August, 2014.

111) W. Cheng, R. Gao, J. Wang, T. Wang, W. Wen, and J. Li, "Envelope deformation in computed order tracking and error in order analysis", *Mechanical Systems and Signal Processing*, Vol. 48, No. 1, pp. 92-102, 2014.

112) W. Cheng, T. Wang, W. Wen, J. Li, and R. Gao, "A new feature selection algorithm based on the mean impact variance", *Mathematical Problems in Engineering*, doi: 10.1155/2014/819438, pp. 1-8, June, 2014.

113) W. Xiang, S. Yan, J. Wu, and R. Gao, "Complexity evaluation on non-linear dynamic behavior of mechanisms with clearance joints by using the fractal method", *Journal of Mechanical Engineering Science*, *Proceedings of the Institution of Mechanical Engineers, Part C,* doi: 10.1177/0954406214531251, June, 2014.

114) D. Cui, S. Yan, X. Guo, and R. Gao, "Parametric resonance of liquid sloshing in partially filled spacecraft tanks during the powered-flight phase of rocket", *Aerospace Science and Technology*, Vol. 35, pp. 93-105, March, 2014.

115) J. Wu, S. Yan, and R. Gao, "Modeling and Analysis of Failure Propagation of Mechanical System with Multi-Operation States Using High-level Petri Net", *Journal of Risk and Reliability*, *Proceedings of the Institution of Mechanical Engineers*, *Part O*, Vol. 228, pp. 347-361, January, 2014.

116) R. Yan, Y. Qian, S. Hu, and R. Gao, "Wind turbine gearbox fault diagnosis based on wavelet domain stationary subspace analysis", *Chinese Journal of Mechanical Engineering*, Vol. 50, No. 11, pp. 9-16, June, 2014.

117) J. Wang, R. Gao, and R. Yan, "Integration of EEMD and ICA for wind turbine gearbox diagnosis", *Wind Energy*, Vol. 17, No. 5, pp. 757-733, May, 2014.

118) J. Wang, R. Gao, and R. Yan, "Multi-scale enveloping order spectrogram for rotating machine health diagnosis", *Mechanical Systems and Signal Processing*, Vol. 46, pp. 28-44, May, 2014.

119) R. Yan, R. Gao, and X. Chen, "Wavelets for fault diagnosis of rotary machines: A review with applications", *Signal Processing*, Vol. 96, pp. 1-15, November, 2013.

120) Z. Fan, R. Gao, N. Asadizanjani, and D. Kazmer, "Acoustic wave-based data transmission for multi-variate sensing", *IEEE Transactions on Instrumentation and Measurement*, Vol. 62, No. 11, pp. 3026-3034, November, 2013.

121) R. Gao, Z. Fan, N. Asadizanjani, and D. Kazmer, "Acoustic-based wireless signal transmission for precision metrology: accuracy and reliability", *CIRP Annals – Manufacturing Technology*, Vol. 62, pp. 519-522, August, 2013.

122) Z. Fan and R. Gao, "A frequency selection scheme for increased imaging speed in ECT", *Measurement Science and Technology*, Vol. 24, No. 7, pp. 74009-74119, July, 2013.

123) R. Zhao, R. Yan, and R. Gao, "Dual-scale cascaded adaptive stochastic resonance for rotary machine health monitoring", *Journal of Manufacturing Systems*, Vol. 32, pp. 529-535, June, 2013.

124) R. Yan, Y. Qian, Z. Huang, and R. Gao, "Recurrence plot entropy for machine defect severity assessment", *Smart Structures and Systems*, Vol. 11, No. 3, pp. 299-324, 2013.

125) W. Cheng, R. Gao, J. Wang, T. Wang, W. Wen, and J. Li, "Error caused by order analysis for rolling bearing fault signal", *Advanced Materials Research*, Vol. 819, pp. 254–258, 2013.

126) S. Liu, R. Gao, D. John, J. Staudenmayer, and P. Freedson, "Tissue artifact removal from respiratory signals based on Empirical Mode Decomposition", *Annals of Biomedical Engineering*, vol. 41, No. 5, pp. 1003-1015, May, 2013.

127) R. Yan, Z. Fan, R. Gao, and H. Sun, "Energy-efficient sensor data gathering in wireless sensor networks", *Sensors and Materials,* Vol. 25, No.1, pp. 31-44, 2013.

128) L. Mo, S. Liu, R. Gao, D. John, J. Staudenmayer, and P. Freedson, "Wireless design of a multi-sensor system for physical activity monitoring", *IEEE Transactions on Biomedical Engineering*, Vol. 59, No. 11, pp. 3230-3237, November, 2012.

129) S. Liu, R. Gao, and P. Freedson, "Computational methods for estimating energy expenditure in human physical activities", *Medicine and Science in Sports and Exercise*, Vol. 44, No. 11, pp. 2138-2146, November, 2012.

130) T. Kurp, R. Gao, and S. Sah, "Adaptive sensing for energy-efficient manufacturing system and process monitoring", *CIRP Journal of Manufacturing Science and Technology*, Vol. 5, pp. 328-336, November, 2012.

131) J. Wang, R. Gao, and R. Yan, "A hybrid approach to bearing defect diagnosis in rotary machines", *CIRP Journal of Manufacturing Science and Technology*, Vol. 5, pp. 357-365, Nov. 2012.

132) J. Wang, S. Liu, R. Gao, and R. Yan, "Current envelope analysis for defect identification and diagnosis in induction motors", *Journal of Manufacturing Systems*, Vol. 31, pp. 380-387, October, 2012.

133) J. Wang and R. Gao, "Pavement distress analysis based on dual-tree complex wavelet transform, *International Journal on Pavement Research and Technology*, Vol. 5, No. 5, pp. 283-288, September, 2012.

134) R. Gao and D. Kazmer, "Multivariate sensing and wireless data communication for process monitoring in RF-shielded environment", *CIRP Annals – Manufacturing Technology*, Vol. 61, pp. 523-526, August, 2012.

135) Z. Fan, M. Ng, R. Gao, J. Cao, and E. Smith, "Real-time monitoring of pressure distribution in microrolling through embedded capacitive sensing", *CIRP Annals – Manufacturing Technology*, Vol. 61, pp. 367-370, August, 2012.

136) R. Yan, Y. Liu, and R. Gao, "Permutation entropy: a nonlinear statistical measure for status characterization of rotary machines", *Mechanical Systems and Signal Processing*, Vol. 29, pp. 474-484, May, 2012.

137) R. Yan and R. Gao, "A nonlinear noise reduction approach to vibration analysis for bearing health diagnosis", *ASME Journal of Computational and Nonlinear Dynamics*, Vol. 7, No. 2, pp. 021004-1-7, April, 2012.

138) A. Kadrolkar, R. Gao, R. Yan, and W. Gong, "Variable word length coding for energy aware signal transmission", *IEEE Transactions on Instrumentation and Measurement*, Vol. 61, No. 4, pp. 850-864, April, 2012.

139) S. Liu, R. Gao, D. John, J. Staudenmayer, and P. Freedson, "Multisensor data fusion for physical activity assessment", *IEEE Transactions on Biomedical Engineering*, Vol. 59, No. 3, pp. 687-696, March, 2012.

140) S. Liu, R. Gao, Q. He, J. Staudenmayer and P. Freedson, "Improved regression models for ventilation estimation based on chest and abdomen movements," *Physiological Measurement*, Vol. 33, pp. 79-93, December, 2011.

141) A. Ganguli, R. Gao, K. Liang, and J. Jundt, "Optimal ultrasonic array focusing in attenuative media", *Ultrasonics*, Vol. 51, pp. 911-920, December, 2011.

142) S. Sah, R. Gao, and T. Kurp, "Model-augmented methods for estimation of contact pressure distribution", *Journal of Manufacturing Systems*, Vol. 30, pp. 223-233, October, 2011.

143) D. John, S. Liu, J. Sasaki, C. Howe, J. Staudenmayer, R. Gao and P. Freedson, "Calibrating an indigenous multi-sensor physical activity measurement system", *Physiological Measurement*, vol. 32, pp. 1473-1489, September, 2011.

144) S. Sah and R. Gao, "An experimental study of contact pressure distribution in panel stamping operations", *International Journal of Advanced Manufacturing Technology*, Vol. 55, pp. 121-132, June, 2011.

145) A. Malhi, R. Yan, and R. Gao, "Prognosis of defect propagation based on recurrent neural networks", *IEEE Transactions on Instrumentation and Measurement*, Vol.60, No. 3, pp.703-711, March, 2011.

146) Z. Fan and R. Gao, "Enhancement of measurement efficiency for electrical capacitance tomography", *IEEE Transactions on Instrumentation and Measurement*, Vol. 60, No. 5, May, 2011.

147) R. Yan and R. Gao, "Wavelet domain principal feature analysis for spindle health diagnosis", *Structural Health Monitoring*, Vol. 10, No. 1, pp. 1-12, January, 2011.

148) D. Kazmer, S. Johnston, R. Gao, and Z. Fan, "Feasibility analysis of an in-mold multivariate sensor", *International Polymer Processing*, Vol. 26, No. 1, pp. 63-72, January, 2011.

149) R. Gao, S. Sah, and N. Mahayotsanun, "On-line measurement of contact pressure distribution at tool-workpiece interfaces in manufacturing operations, *CIRP Annals – Manufacturing Technology*, Vol. 59, pp. 399-402, August, 2010.

150) R. Yan and R. Gao, "Harmonic wavelet-based data filtering for enhanced machine defect identification", *Journal of Sound and Vibration*, Vol. 329, No. 15, pp. 3203-3217, July, 2010.

151) J. Zhang, R. Yan, R. Gao, and Z. Feng, "Performance enhancement of Ensemble Empirical Mode Decomposition", *Mechanical Systems and Signal Processing*, Vol. 24, pp. 2104-2123, October, 2010.

152) A. Ganguli, R. Gao, K. Liang, J. Jundt, and A. Ordonez, "Experimental investigation of efficient ultrasonic focusing in attenuative solids, *IEEE Transactions on Instrumentation and Measurement,* Vol. 59, No. 9, pp. 2261-2271, September, 2010.

153) D. Kazmer, S. Velusamy, S. Westerdale, S. Johnston, and R. Gao, "A comparison of seven filling to packing switchover methods for injection molding", *Polymer Engineering and Science*, Vol. 50, No. 10, pp. 2031-2043, October, 2010.

154) S. Sah and R. Gao, "Effect of clearance and embedding depth on sensors for integrated forming process monitoring", *Transactions of the North American Manufacturing Research Institution, Society of Manufacturing Engineers*, Vol. 38, pp. 639-646, May, 2010.

155) S. Johnston, D. Kazmer, and R. Gao, "On-line simulation-based process control for injection molding", *Polymer Engineering and Science*, Vol. 49, pp. 2482-2491, December, 2009.

156) R. Yan, R. Gao, L. Zhang, and K. Lee, "A module-based software system for spindle condition monitoring", *International Journal of Mechatronics and Manufacturing Systems*, Vol. 2, Nos. 5-6, pp. 532-551, October, 2009.

157) R. Yan and R. Gao, "Energy-based feature extraction for defect diagnosis in rotary machines", *IEEE Transactions on Instrumentation and Measurement,* Vol. 58, No. 9, pp. 3130-3139, September, 2009.

158) R. Yan, R. Gao, and C. Wang, "Experimental evaluation of a unified time-scale-frequency technique for bearing defect feature extraction", *ASME Journal of Vibration and Acoustics*, Vol. 131, No. 4, pp. 041012, August, 2009.

159) R. Yan and R. Gao, "Multi-scale enveloping spectrogram for vibration analysis in bearing defect

diagnosis", *Tribology International,* Vol. 42, No. 2, pp. 293-302, February 2009.

160) R. Yan, R. Gao, L. Zhang, and K. Lee, "A module-based software system for spindle condition monitoring", *International Journal of Mechatronics and Manufacturing Systems*, Vol. 2, Nos. 5-6, pp. 532-551, October, 2009.

161) R. Yan and R. Gao, "Base wavelet selection for bearing vibration signal analysis", *International Journal of Wavelets, Multi-resolution, and Information Processing*, Vol. 7, No. 4, pp. 411-426, July, 2009.

162) N. Mahayotsanun, S. Sah, J. Cao, M. Peshkin, R. Gao, and C. Wang, "Tooling-integrated sensing systems for stamping process monitoring", *International Journal of Machine Tools and Manufacture*, Vol. 49, pp. 634-644, April, 2009.

163) S. Sah and R. Gao, "Sensor placement strategy for stamping tooling integration based on geometric methods", *Transactions of the North American Manufacturing Research Institution, Society of Manufacturing Engineers*, pp. 605-612, May, 2009.

164) C. Wang, R. Gao, R. Yan, and A. Malhi, "Rolling bearing defect severity assessment under varying operating conditions", *International Journal of Manufacturing Research*, Vol. 4, No. 1, pp. 37-56, January, 2009.

165) C. Wang, R. Gao, and R. Yan, "Unified time-scale-frequency analysis for machine defect signature extraction: Theoretical framework", *Mechanical Systems and Signal Processing,* Vol. 23, No.1, pp. 226-235, January 2009.

166) S. Sah and R. Gao, "Process monitoring in stamping operations through tooling integrated sensing", *Journal of Manufacturing Systems*, Vol. 27, pp. 123-129, December, 2008.

167) R. Gao, Z. Fan, and D. Kazmer, "Injection molding process monitoring using a self-energized dual-parameter sensor", *CIRP Annals – Manufacturing Technology*, Vol. 57, pp. 389-393, August, 2008.

168) D. Ball, R. Yan, T. Licht, A. Deshmukh, and R. Gao, "A strategy for decomposing large-scale energy-constrained sensor networks for system monitoring", *Production Planning and Control*, pp. 435-447, Vol. 19, No. 4, June 2008.

169) S. Sah and R. Gao, "Process monitoring in stamping operations through tooling integrated sensing", *Transactions of the North American Manufacturing Research Institution, Society of Manufacturing Engineers*, pp. 161-168, Vol. 36, May, 2008.

170) R. Yan and R. Gao, "Rotary machine health diagnosis based on empirical mode decomposition", *ASME Journal of Vibration and Acoustic*, Vol. 130, No. 2, pp. 021007/1~12, April, 2008.

171) B. Mullen, T. Champagne, S. Krishnamurty, D. Dickson, and R. Gao, "Exploring the safety and therapeutic effects of deep pressure stimulation using a weighted blanket", *Journal of Occupational Therapy in Mental Health*, Vol. 24, No. 1, pp. 65-89, 2008.

172) R. Yan and R. Gao, "Approximate entropy as a diagnostic tool for machine health monitoring", *Mechanical Systems and Signal Processing*, Vol. 21, No. 2, pp. 824-839, February, 2007.

173) Y. Su, A. Wolczowski, M. Fisher, G. Bell, D. Burn, and R. Gao, "Towards an EMG controlled prosthetic hand using a 3D electromagnetic positioning system", *IEEE Transactions on Instrumentation and Measurement*, Vol. 56, No. 1, pp. 178-186, February, 2007.

174) Y. Cui, R. Gao, D. Yang, and D. Kazmer, "A Bond graph approach to energy efficiency analysis of a self-powered wireless pressure sensor", *Smart Structures and Systems*, Vol. 3, No. 1, pp. 1-22, January, 2007.

175) R. Yan and R. Gao, "Hilbert-Huang Transform-based vibration signal analysis for machine health monitoring", *IEEE Transactions on Instrumentation and Measurement*, Vol. 55, No. 6, pp. 2320-2329, December, 2006.

176) L. Zhang, R. Gao, and K. Lee, "Spindle health diagnosis based on analytic wavelet enveloping", *IEEE Transactions on Instrumentation and Measurement*, Vol. 55, No. 5, pp. 1850-1858, October, 2006.

177) R. Gao and R. Yan, "Non-stationary signal processing for bearing condition monitoring", *International Journal of Manufacturing Research*, Vol. 1, No. 1, pp. 18-40, 2006.

178) S. Sheng, L. Zhang, and R. Gao, "A systematic sensor placement strategy for enhanced defect

detection in rolling bearings", *IEEE Sensors Journal*, Vol. 6, No. 5, pp. 1346-1354, October, 2006.

179) L. Zhang, R. Gao, and K. Lee, "Optimization of sensor locations for spindle condition monitoring", *Transactions of the North American Manufacturing Research Institution, Society of Manufacturing Engineers*, pp. 55-62, May, 2006.

180) R. Gao and Z. Fan, "Architectural design of a sensory-node-controller for optimized energy utilization in sensor networks", *IEEE Transactions on Instrumentation and Measurement,* Vol. 55, No. 2, pp. 415-428, April, 2006.

181) C. Theurer, L. Zhang, D. Kazmer, and R. Gao, "Passive charge modulation for a wireless pressure sensor", *IEEE Sensors Journal*, Vol. 6, No. 1, pp. 47-54, February, 2006.

182) D. Shi, P. Unsworth, and R. Gao, "Sensorless speed measurement of induction motor using Hilbert transform and interpolated fast Fourier transform", *IEEE Transactions on Instrumentation and Measurement,* Vol. 55, No. 1, pp. 290-299, February, 2006.

183) L. Zhang, C. Theurer, R. Gao, and D. Kazmer, "Analytic wavelet-based ultrasonic pulses differentiation for injection mold cavity pressure measurement", *ASME Journal of Manufacturing Science and Engineering,* Vol. 128, pp. 370-374, February, 2006.

184) D. Kazmer, R. Nageri, V. Kudchakar, B. Fan., and R. Gao, "Validation of three on-line flow simulations for injection molding," *Polymer Engineering and Science*, Vol. 46, No. 3, pp. 274-288, March, 2006.

185) R. Yan and R. Gao, "An efficient approach to machine health diagnosis based on harmonic wavelet packet transform", *Robotics and Computer Integrated Manufacturing*, Vol. 21, pp. 291-301, August, 2005.

186) R. Gao and Y. Cui*,* "Vibration-based sensor powering for manufacturing process monitoring", *Transactions of the North American Manufacturing Research Institution, Society of Manufacturing Engineers*, Vol. 33, pp. 335-342, May, 2005.

187) L. Zhang, C. Theurer, R. Gao, and D. Kazmer, "Design of ultrasonic transmitters with defined frequency characteristics for wireless pressure sensing in injection molding", *IEEE Transactions on Ultrasonics, Ferroelectrics, and Frequency*, Vol. 52, No. 8, pp. 1360-1371, August, 2005.

188) R. Gao, C. Wang, and S. Sheng, "Optimal sensor placement strategy and sensor design for high quality system monitoring", *Smart Structures and Systems,* Vol. 1, No. 2, pp. 121-140, April, 2005.

189) B. Holm-Hansen, R. Gao, and L. Zhang, "Customized wavelet for bearing defect detection", *ASME Journal of Dynamic Systems, Measurement, and Control*, Vol. 126, pp. 740-745, December, 2004.

190) A. Malhi and R. Gao, "PCA-based feature selection scheme for machine defect classification", *IEEE Transactions on Instrumentation and Measurement,* Vol. 53, No. 6, pp. 1517-1525, December, 2004.

191) L. Zhang, C. Theurer, R. Gao, and D. Kazmer, "A self-energized sensor for wireless injection mold cavity pressure measurement: design and evaluation," *ASME Journal of Dynamic Systems, Measurement, and Control*, Vol. 126, pp. 309-318, June, 2004.

192) R. Yan and R. Gao, "Complexity as a measure for machine health evaluation", *IEEE Transactions on Instrumentation and Measurement,* Vol. 53, No. 4, pp. 1327-1334, August, 2004.

193) C. Theurer, L. Zhang, D. Kazmer, and R. Gao, "Energy extraction for a self-energized pressure sensor", *IEEE Sensors Journal*, Vol. 4, No. 1, pp. 28-35, February, 2004.

194) R. Luharuka, R. Gao, and S. Krishnamurty, "Design and realization of a portable data logger for physiological sensing", *IEEE Transactions on Instrumentation and Measurement,* Vol. 52, No. 4, pp. 1289-1295, August, 2003.

195) L. Zhang, C. Theurer, R. Gao, and D. Kazmer, "Frequency design of an ultrasonic transmitter for injection molding pressure measurement," *Transactions of the North American Manufacturing Research Institution, Society of Manufacturing Engineers*, Vol. 31, pp. 579-586, 2003.

196) C. Wang and R. Gao, "Wavelet transform with spectral post-processing for enhanced feature extraction", *IEEE Transactions on Instrumentation and Measurement,* Vol. 52, No. 4, pp. 1296-1301, August, 2003.

197) B. Varghese, S. Pathare, R. Gao, S. Malkin, and C. Guo, "In-process monitoring of truing using a sensor integrated diamond grinding wheel", *Transactions of the North American Manufacturing Research Institution, SME,* Vol. 30, pp. 295-302, 2002.

198) R. Gao and P. Huenerberg, "Design of a CDMA-based wireless data transmitter for embedded sensing", *IEEE Transactions on Instrumentation and Measurement*, Vol. 51, No. 6, pp. 1259-1265, December, 2002.

199) R. Gao and A. Suryavanshi, "BIT for intelligent system design and condition monitoring", *IEEE Transactions on Instrumentation and Measurement*, Vol. 51, No. 5, pp. 1061-1067, October, 2002.

200) L. Zhang, C. Theurer, R. Gao, and D. Kazmer, "Development of a wireless pressure sensor with remote acoustic transmission," *Transactions of the North American Manufacturing Research Institution, Society of Manufacturing Engineers*, Vol. 30, pp. 573-580, 2002.

201) C. Wang and R. Gao, "A virtual instrumentation system for integrated bearing condition monitoring", *IEEE Transactions on Instrumentation and Measurement*, Vol. 49, No. 2, pp. 325-332, April, 2000.

202) B. Varghese, S. Pathare, R. Gao, C. Guo, and S. Malkin, "Development of a sensor-integrated 'Intelligent' grinding wheel for in-process monitoring", *CIRP Annals*, Vol. 49, pp. 231-234, January, 2000.

203) B. Holm-Hansen and R. Gao, "Vibration analysis of a sensor-integrated ball bearing", *ASME Journal of Vibration and Acoustics,* Vol. 122, pp. 384-392, October, 2000.

204) B. Holm-Hansen and R. Gao, "Structural design and analysis for a sensor-integrated ball bearing", *Finite Elements in Analysis and Design,* Elsevier Science, Vol. 34, pp. 257-270, 2000.

205) B. Holm-Hansen and R. Gao, "Modeling of a sensor-integrated smart bearing using finite element method", *Mathematical Modeling and Scientific Computing*, Vol. 8, ISSN 1067-0688, 1998.

206) H. Gu and R. Gao, "Resolution of overlapping echoes and constrained matched filter", *IEEE Transactions on Signal Processing*, Vol. 45, No. 7, pp. 1854-1857, July, 1997.

207) R. Gao, J. Fang, B. Rao, and R. Warrington, "Miniaturized surface-driven electrostatic actuators: design and performance evaluation", *IEEE/ASME Transactions on Mechatronics*, Vol. 2, No. 1, pp. 1-7, March, 1997.

208) B. Rao, R. Gao, and C. Friedrich, "Integrated force measurement for on-line cutting geometry inspection", *IEEE Transactions on Instrumentation and Measurement*, Vol. 44, pp. 977-980, 1995.

209) R. Gao, Y. Jin, and R. Warrington, "Microcomputer-based real-time bearing monitor", *IEEE Transactions on Instrumentation and Measurement*, Vol. 43, pp. 216-219, April, 1994.

210) R. Gao and W. Thelen, "Sensor-embedded grinding balls for on-line load distribution measurement in ball mills", *Journal of Engineering Manufacture*, Institution of Mechanical Engineers, United Kingdom, Vol. 208, pp. 183-190, August, 1994.

REFEREED CONFERENCE PAPERS

1) S. Liu, J. Zhang, R. Gao, X. Wang, and L. Wang, "Vision-language model-driven scene understanding and robotic object manipulation", *Proc. IEEE 20th International Conference on Automation Science and Engineering* (CASE), Puglia, Italy, August, 2024.

2) Y. Chen, J. Zhang, T. Babinec, B. Thurston, G. Daehn, D. Dean, K. Loparo, D. Hoelzle and R. Gao, "Machine Learning-enhanced Model Predictive Control for incremental bending of skeletal fixation plates", *Proc. International Symposium on Flexible Automation* (ISFA), Seattle, WA, July, 2024.

3) D. Hoelzle, B. Thurston, J. Vazquez-Armendariz, T. Babinec, L. Olivas-Alanis, S. Niezgoda, G. Daehn, D. Dean, and R. Gao, "Kinematic analysis of engagement and bending capabilities of a point-of-care, incremental skeletal fixation plate bending system", *Proc. 52nd North American Manufacturing Research Conference* (NAMRC 52), Knoxville, TN, June, 2024.

4) F. Gao, L. Xia, J. Zhang, S. Liu, L. Wang, and R. Gao, "Integrating large language model for natural language-based instruction toward robust human-robot collaboration", *Procedia CIRP*, 57th CIRP Conference on Manufacturing Systems (CMS), Póvoa de Varzim, Portugal, May, 2024.

5) X. Li, R. Athinarayanan, B. Wang, W. Yuan, Q. Zhou, M. Jun, J. Bravo, R. Gao, L. Wang, and Y. Koren, "Smart reconfigurable manufacturing: literature analysis", *Procedia CIRP*, 11th CIRP Global Web Conference (CIRPe 2023), Vol. 121, pp. 43-48, October, 2023.

6) Z. Fan and R. Gao, "Data-driven methods for critical dimension inferencing in nanomanufacturing", *Proc. 6th World Congress on Micro and Nano Manufacturing*, Evanston, IL, September 2023.

7) J. Zhang, C. Cooper, and R. Gao, "Federated learning for privacy-preserving collaboration in smart manufacturing", *Procedia Manufacturing*, 18th Global Conference on Sustainable Manufacturing (GCSM), Berlin, Germany, October, 2022.

8) J. Zhang, C. Liu, and R. Gao, "Machine learning-based robotic object detection and grasping for collaborative assembly", *Proc. 2022 International Symposium on Flexible Automation* (ISFA), Yokohama, Japan, July, 2022.

9) S. Liu, L. Wang, X. Wang, C. Cooper, and R. Gao, "Leveraging multimodal data for intuitive robot control towards human-robot collaborative assembly", *Procedia CIRP, 54th CIRP Conference on Manufacturing Systems (CMS)*, pp. 206-211, Athens, Greece, September, 2021.

10) D. Liu, W. Cheng, J. Zhang, R. Gao, and W. Wen, "Integrated method of generalized demodulation and artificial neural network for robust bearing fault recognition", *Procedia Manufacturing*, 49th SME North American Manufacturing Research Conference (NAMRC 49), Vol. 53, pp. 628-635, Cincinnati, OH, June, 2021.

11) C. Chen, F. Shen, Z. Fan, R. Gao, and R. Yan, "A KLIEP-based transfer learning model for gear fault diagnosis under varying working conditions", *Proc. International Conference on Sensing, Measurement, and Data Analytics in the Era of Artificial Intelligence* (ICSMD), pp. 188-193, October 2020.

12) J. Zhang, P. Wang, and R. Gao, "Attention mechanism-incorporated deep learning for AM part quality prediction", *Procedia CIRP, 53rd CIRP Conference on Manufacturing Systems (CMS)*, Vol. 93, pp. 96-101, July 2020.

13) C. Cooper, D. Liu, J. Zhang, and R. Gao, "Feature-based transfer learning for bearing fault recognition without available fault data", *Proc. ASME 2020 International Symposium on Flexible Automation (ISFA)*, Chicago, IL, paper #: ISFA2020-9636, July 2020.

14) C. Cooper, J. Zhang, R. Gao, P. Wang, and I. Ragai, "Anomaly detection in milling tools using acoustic signals and generative adversarial networks", *Procedia Manufacturing*, 48th SME North American Manufacturing Research Conference (NAMRC 48), Cincinnati, OH, Vol. 48, pp. 372-378, June 2020.

15) F. Shen, C. Chen, J. Xu, R. Gao, and R. Yan, "A two-order transfer model for gearbox fault diagnosis, *Proc. 2020 IEEE International Instrumentation and Measurement Technology Conference* (I^{2}MTC), pp. 1-6, Dubrovnik, Croatia, May 25-28, 2020.

16) C. Cooper, P. Wang, J. Zhang, R. Gao, T. Roney, and I. Ragai, "Convolutional Neural Network-based tool condition monitoring in vertical milling operations using acoustic signals", *Procedia Manufacturing*, 8th International Conference on Through-Life Engineering Services, Cleveland, OH, USA, October 2019.

17) J. Grezmak, J. Zhang, P. Wang, and R. Gao, "Multi-stream convolutional neural network-based faulty diagnosis for variable frequency drive in sustainable manufacturing systems", *Procedia Manufacturing*, 17th Global Conference on Sustainable Manufacturing (GCSM), Shanghai, China, October, 2019.

18) P. Wang and R. Gao, "Prognostic modeling of performance degradation in energy storage by lithium-ion Batteries", *Procedia Manufacturing*, *ASME 2019 Manufacturing Science and Engineering Conference*, Vol. 34, pp. 911-920, Erie, PA, June, 2019.

19) Q. Qiao, J. Wang, L. Ye, and R. Gao, "Digital Twin for machining tool condition prediction", *Procedia CIRP*, 52nd CIRP Conference on Manufacturing Systems (CMS), Vol. 81, pp. 1388-1393, Ljubljana, Slovenia, June, 2019.

20) J. Grezmak, P. Wang, and R. Gao, "Explainable convolutional neural network for gearbox fault diagnosis", *Procedia CIRP*, *26th CIRP Life Cycle Engineering (LCE) Conference*, Vol. 80, pp. 476-481, West Lafayette, IN, May, 2019.

21) J. Zhang, P. Wang, and R. Gao, "Modeling of layer-wise additive manufacturing for part quality prediction", *Procedia Manufacturing*, *7th International Conference on Through-life Engineering Services*, Vol. 16, pp. 155-162, Cranfield, UK, November, 2018.

22) J. Zhang, P. Wang, R. Gao, C. Sun, and R. Yan, "Induction motor condition monitoring for sustainable manufacturing", *Procedia Manufacturing*, *16th Global Conference on Sustainable Manufacturing*, Vol. 33, pp. 802-809, Lexington, KY, October, 2018.

23) P. Wang, and R. Gao, "Lévy process-based stochastic modeling for machine performance degradation prognosis", *Proc. 44th Annual Conference of the IEEE Industrial Electronics Society*, Washington DC, October, 2018.

24) C. Sun, C. Zhang, X. Chen, R. Yan, and R. Gao, "Deep residual network with hybrid dilated convolution for gearbox fault diagnosis", *Proc. 2018 International Symposium on Flexible Automation* (ISFA), Kanazawa, Japan, July, 2018.

25) P. Wang, R. Yan, and R. Gao, "Multi-mode particle filter for bearing remaining life prediction", *Proc. 2018 ASME Manufacturing Science and Engineering Conference*, paper #: MSEC 2018-6638, College Station, TX, June, 2018.

26) D. Zhao, J. Li, W. Cheng, R. Gao, and R. Yan, "Vold-Kalman generalized demodulation for multi-faults detection of gear and bearing under variable speeds", *Procedia Manufacturing*, *46th SME North American Manufacturing Research Conference (NAMRC 46),* Vol. 26, pp. 1213-1220, College Station, TX, June, 2018.

27) J. Zhang, P. Wang, Y. Yan, and R. Gao, "Deep learning for improved system remaining life prediction", *Procedia CIRP*, *CIRP Conference on Manufacturing Systems (CMS)*, Vol. 72, pp. 1033-1038, Stockholm, Sweden, May, 2018.

28) J. Zhang, P. Wang, R. Gao, and R. Yan, "An image processing approach to machine fault diagnosis based on visual words representation", *Procedia Manufacturing*, *6th International Conference on Through-life Engineering Services*, Vol. 19, pp. 42-49, Bremen, Germany, November, 2017.

29) J. Zhang, P. Wang, C. Sun, Y. Yan, and R. Gao, "Induction motor fault diagnosis and classification through sparse representation", *Proc. ASME 2017 Dynamic Systems and Control Conference*, DSCC2017-5259, Tysons Corner, VA, October, 2017.

30) P. Cao, Z. Fan, R. Gao, and J. Tang, "A manufacturing oriented single point search hyper-heuristic scheme for multi-objective optimization", *Proc. ASME 2017 International Design Engineering Technical Conferences and Computers and Information in Engineering Conference*, DETC2017-68265, Cleveland, OH, August, 2017.

31) D. Wu, C. Jennings, J. Terpenny, R. Gao, and S. Kumara, "Data-driven prognostics using Random Forests: prediction of tool wear", *Proc. ASME 2017 International Manufacturing Science and Engineering Conference*, MSEC2017-2679, Los Angeles, CA, May, 2017.

32) P. Wang and R. Gao, "Through life analysis for machine tools: from design to remanufacture", *Procedia CIRP, 5th International Conference in Through-Life Engineering Services,* Vol. 59, pp. 2-7, *Cranfield, UK*, 2017.

33) S. Shao, W. Sun, P. Wang, R. Gao, and R. Yan, "Learning Features from Vibration Signals for Induction Motor Fault Diagnosis", *Proc. 2016 International Symposium on Flexible Automation*, Cleveland, OH, August, 2016.

34) P. Wang and R. Gao, "Online Fault Detection and Diagnosis for Chiller System", *Proc. 12th IEEE International Conference on Automation Science and Engineering*, Fort Worth, Texas, August, 2016.

35) Z. Fan, R. Gao, M. Ng, J. Cao and E. Smith, "Circumferential pressure measurement for micro-rolling process monitoring", *Proc. 2016 International Symposium on Flexible Automation*, Cleveland, OH, August, 2016.

36) P. Cao, Z. Fan, R. Gao, and J. Tang, "Complex housing: modelling and optimization using an improved multi-objective simulated annealing algorithm", *Proceedings of the ASME 2016 International Design Engineering Technical Conferences and Computers and Information in Engineering Conference*, p. V02BT03A034, Charlotte, NC, August, 2016.

37) C. Sun, P. Wang, R. Yan, and R. Gao, "A Sparse Approach to Fault Severity Classification for Gearbox Monitoring", *Proc. 19th IEEE International Conference on Information Fusion*, Heidelberg, Germany, July, 2016.

38) D. Wu, J. Terpenny, L. Zhang, R. Gao, and T. Kurfess, „Fog-Enabled Architecture for Data-Driven Cyber-Manufacturing Systems", *Proc. ASME 2016 International Manufacturing Science and Engineering Conference*, MSEC2016-8559, Blacksburg, VA, May, 2016.

39) P. Wang, R. Gao, D. Wu, and J. Terpenny, "A computational framework for cloud-based machine prognosis", *Procedia CIRP, 49th CIRP Conference on Manufacturing Systems*, pp. 309-314, Stuttgart, Germany, 2016.

40) Z. Fan, R. Gao, P. Wang, and D. Kazmer, "Multi-sensor data fusion for improved measurement accuracy in injection molding", *Proc. 2016 IEEE International Instrumentation and Measurement Technology Conference*, Taipei, Taiwan, May, 2016.

41) D. Wu, P. Wang, R. Yan, and R. Gao, "A correlation-based approach to trustworthy sensing for cyber-physical systems", *Proc. 2016 IEEE International Instrumentation and Measurement Technology Conference*, Taipei, Taiwan, May, 2016.

42) X. Yang, R. Yan and R. Gao, "Induction motor fault diagnosis based on ensemble classifiers", *Proc. IEEE International Instrumentation and Measurement Technology Conference*, Taipei, Taiwan, May 23-26, 2016.

43) P. Wang and R. Gao, "Stochastic tool wear prediction for sustainable manufacturing", *Procedia CIRP, 23rd CIRP Conference on Life Cycle Engineering (LCE)*, pp. 236-241, Berlin, Germany, May, 2016.

44) P. Wang, R. Gao, and L. Zhang, "A framework for cloud-based prognostics in manufacturing", *Procedia CIRP, 49th CIRP Conference on Manufacturing Systems*, Vol. 57, pp. 309-314, Stuttgart, Germany, May, 2016.

45) F. Shen, C. Chen, R. Yan and R. Gao, "Bearing fault diagnosis based on SVD feature extraction and transfer learning classification", *Proc. 1st International Conference on Reliability Systems Engineering & 2015 Prognostics and System Health Management Conference*, Beijing, China, October, 2015.

46) X. Yang, R. Yan and R. Gao, "Induction motor fault diagnosis using multiple class feature selection", *Proc. IEEE International Instrumentation and Measurement Technology Conference*, Pisa, Italy, May 11-14, 2015.

47) P. Wang, X. Tang, and R. Gao, "Automated performance tracking for heat exchangers in HVAC", *Proc. IEEE International Conference on Automation Science and Engineering* (CASE), pp. 949-954, Gothenburg, Sweden, August, 2015.

48) P. Cao, Z. Fan, R. Gao, and J. Tang, "A multi-objective simulated annealing approach towards 3D packing problems with strong constraints: CMOSA", *Proceedings of the ASME 2015 International Design Engineering Technical Conferences and Computers and Information in Engineering Conference*, p. V02AT03A052, Boston, MA, August, 2015.

49) P. Wang R. Gao, X. Tang, and Z. Fan, "Sensing uncertainty evaluation for product quality", *Procedia CIRP, 48th CIRP Conference on Manufacturing Systems (CMS)*, Vol. 41, pp. 706-711, Naples, Italy, June, 2015.

50) P. Wang and R. Gao, "Enhanced particle filtering for parameter estimation", *Procedia Manufacturing, 43rd North American Manufacturing Research Conference (NAMRC)*, Charlotte, NC, June, 2015.

51) J. Wang, R. Gao, X. Tang, Z. Fan, and P. Wang, "Dual-tee wavelet packet transform for ultrasonic data communication through metal structure", *Proc. ASME International Manufacturing Science and Engineering Conference*, Charlotte, NC, June, 2015.

52) P. Wang, R. Gao, and Z. Fan, "Switching local search particle filter for heat exchanger degradation prognosis", *Proc. 2015 IEEE International Instrumentation and Measurement Technology Conference*, Pisa, Italy, May, 2015.

53) X. Tang, R. Gao, Z. Fan, and D. Kazmer, "Bond graph for design improvement of a multivariate sensor", *Proc. IEEE International Instrumentation and Measurement Technology Conference*, Pisa, Italy, May, 2015.

54) P. Wang and R. Gao, "Particle filtering-based system degradation prediction applied to jet engines", *Proc. 2014 Annual Conference of Prognosis and Health Management Society*, Vol. 5, paper # 067, Fort Worth, TX, September, 2014.

55) P. Wang, R. Gao, Z. Fan, D. Karg, K. Kwolek, and A. Consiglio, "Noninterference identification of rotating blade vibration", *Proc. 12th International Conference on Motion and Vibration*, paper # 10205, Sapporo, Japan, August, 2014.

56) P. Cao, Z. Fan, R. Gao, and J. Tang, "Optimal configuration of valves and plumbing lines in complex housing", *Proc. ASME 2014 International Design & Engineering Technical Conferences*, paper # 35259, Buffalo, NY, August, 2014.

57) Z. Fan, X. Zou, R. Gao, M. Ng, J. Cao, and E. Smith, "Design and evaluation of an embedded pressure sensor for microrolling process monitoring", *Proc. 2014 International Symposium on Flexible Automation* (ISFA), paper # 86L, Hyogo, Japan, July, 2014.

58) J. Wang, P. Wang, and R. Gao, "Particle filter for tool wear prediction", *Proc. 42nd North American Manufacturing Research Conference*, paper # 4521, Detroit, MI, June, 2014.

59) Y. Yang, R. Gao, Z. Fan, J. Wang, and L. Wang, "Cloud-based prognosis: perspective and challenge", *Proc. ASME 2014 Manufacturing Science and Engineering Conference*, Detroit, MI, June, 2014.

60) L. Wang, R. Gao, and I. Ragal, "An integrated cyber-physical system for cloud manufacturing", *Proc. 42nd North American Manufacturing Research Conference*, Detroit, MI, June, 2014.

61) Y. Yang, Z. Fan, and R. Gao, "Optimal battery control strategy for wireless sensor network with solar energy supply", *Proc. American Control Conference*, pp. 3559-3564, Portland, OR, June, 2014.

62) B. Ai, Z. Fan, and R. Gao, "Occupancy estimation for smart building by an auto-regressive Hidden Markov Model", *Proc. American Control Conference*, pp. 2234-2239, Portland, OR, June, 2014.

63) G. Gordon, D. Kazmer, R. Gao, Z. Fan, and X. Tang, "Steady state and response time temperature validation for a multivariate injection molding sensor", *Annual Technical Conference - Antec, Conference Proceedings*. 3: pp. 2298-2304, Las Vegas, NV, April, 2014.

64) P. Wang, R. Gao, H. Wang, and H. Yuan, "Defect growth prediction in rolling bearings based on approximate entropy", *Proc. ASME Dynamic Systems and Control Conference*, Stanford University, October, 2013.

65) J. Wang, P. Wang, and R. Gao, "Tool life prediction for sustainable manufacturing", *Proc. 11th Global Conference on Sustainable Manufacturing*, pp. 233-237, Berlin, Germany, September, 2013.

66) C. Ji, R. Gao, Z. Fan, K. Liang, and J. Pabon, "Adaptive control of acoustic waves in flexible structure", *Proc. ASME Dynamic Systems and Control Conference*, Stanford University, October, 2013.

67) J. Wang, R. Gao, and R. Yan, "Concordia transform-based current analysis for induction motor diagnosis", *Proc. International Conference on Damage Assessment of Structures*, Trinity College, Dublin, Ireland, July, 2013.

68) J. Wang and R. Gao, "Multiple model particle filtering for bearing life prognosis", *Proc. IEEE International Conference on Prognostics and Health Management*, National Institute of Standards and Technology, June, 2013.

69) R. Zhao, R. Yan, and R. Gao, "Dual-scale cascaded adaptive stochastic resonance for rotary machine health monitoring", *Proc. 41st North American Manufacturing Research Conference*, University of Wisconsin, WI, June, 2013.

70) L. Mo, S. Liu, R. Gao, and P. Freedson, "Energy-efficient and data synchronized body sensor network for physical activity measurement", *Proc. IEEE International Instrumentation and Measurement Technology Conference*, Minneapolis, MN, May, 2013.

71) Z. Fan, R. Gao, and D. Kazmer, "Acoustic-based wireless data transmission for process monitoring", *Proc. IEEE International Instrumentation and Measurement Technology Con*ference, Minneapolis, MN, May, 2013.

72) Z. Fan, X. Zou, R. Gao, and J. Cao, "Pressure reconstruction for microrolling process monitoring", *Proc. 46th CIRP Conference on Manufacturing Systems*, Sesimbra, Portugal, May, 2013.

73) G. Gordon, D. Kazmer, M. Fisches, R. Gao, Z. Fan, and N. Asadiznajani, "Melt flow simulation of an injection molding cavity for validation of a multivariate sensor", *Annual Technical Conference - Antec, Conference Proceedings*. 2: pp. 1116-1121, Cincinnati, OH, April, 2013.

74) G. Gordon, D. Kazmer, R. Gao, Z. Fan, and N. Asadiznajani, "Temperature modeling for a multivariate injection molding sensor", *Annual Technical Conference - Antec, Conference Proceedings*. 2: pp. 1103-1110, Cincinnati, OH, April, 2013.

75) M. Fisches, D. Kazmer, R. Gao, G. Gordon, Z. Fan, and N. Asadizanjani, "Verification of rheological mixing rules to the application of masterbatches", *Proc. Society of Plastics Engineers Annual Technical Conference*, Cincinnati, OH, April, 2013.

76) S. Liu, R. Gao, L. Mo, and P. Freedson, "Wearable sensing for physical activity measurement: design and performance evaluation", *Proc. 6th IFAC Symposium on Mechatronic Systems*, Zhejiang University, Hangzhou, China, April, 2013.

77) M. Ng, J. Magargee, R. Fan, R. Gao, and J. Cao, "Surface texturing in titanium allow by electrically-assisted micro-rolling", *Proc. 8th International Conference on MicroManufacturing* (ICOMM), University of Victoria, Vancouver, Canada, March, 2013.

78) C. Ji, Z. Fan, R. Gao, K. Liang, and J. Pabon, "Vibration modeling and control of drilling tools using micro fiber composite actuators", *Proc. ASME Dynamic Systems and Control Conference*, paper #8689, pp. 1-6, Fort Lauderdale, FL, October, 2012.

79) S. Liu, R. Gao, D. John, J. Staudenmayer, and P. Freedson, "Pattern classification based on sparse representation", *Proc. ASME Dynamic Systems and Control Conference*, paper #8678, pp. 1-6, Fort Lauderdale, FL, October, 2012 (received Best Paper in Session award).

80) S. Liu, R. Gao, D. John, J. Staudenmayer and P. S. Freedson, "Classification of physical activities based on sparse representation," *2012 Annual International Conference of the IEEE Engineering in Medicine and Biology Society*, pp. 6200-6203, San Diego, CA, August, 2012.

81) Z. Fan and R. Gao, "A frequency selection scheme for increased imaging speed in ECT," *2012 IEEE International Conference on Imaging Systems and Techniques Proceedings*, pp. 616-621, Manchester, UK, July, 2012.

82) D. Kazmer, S. Johnston, G. Gordon, R. Gao, Z. Fan, and N. Asadiznajani, "A multivariate in-mold sensor design for measurement of melt pressure, temperature, velocity, and viscosity," *Annual Technical Conference - Antec, Conference Proceedings*. 2: pp. 1559-1566, Orlando, FL, April, 2012.

83) J. Wang, R. Gao, R. Yan, and L. Wang, "An integrative computational method for gearbox diagnosis", *Procedia CIRP* (*CIRP Conference on Intelligent Computation in Manufacturing Engineering*), pp. 1-6, Naples, Italy, July, 2012.

84) R. Zhao, R. Yan, and R. Gao, "A novel adaptive stochastic resonance algorithm based on twice sampling", *Proc. 2012 National Conference on Equipment Fault Diagnosis*, Zhengzhou, China, August, 2012.

85) A. Mohammed, L. Wang, and R. Gao, "Integrated image processing and path planning for robotic sketching", *Procedia CIRP* (*CIRP Conference on Intelligent Computation in Manufacturing Engineering*), pp. 1-6, Naples, Italy, July, 2012.

86) N. Asadizanjani, R. Gao, Z. Fan, and D. Kazmer, "Viscosity measurement in injection molding using a multivariate sensor", *Proc. ASME/ISCIE International Symposium on Flexible Automation* (ISFA), paper #7246, pp. 1-7, St. Louis, MO, June, 2012.

87) J. Wang, S. Liu, R. Gao, and R. Yan, "Current envelope analysis for defect identification and diagnosis in induction motors" *Proc. 40th North American Manufacturing Research Conference*, pp. 1-9, Notre Dame University, IN, June, 2012.

88) Z. Fan and R. Gao, "An Adaptive Total variation regularization method for electrical capacitance tomography", *Proc. IEEE International Instrumentation and Measurement Technology Conference*, pp. 2230-2235, Graz, Austria, May, 2012.

89) Z. Fan, R. Gao, N. Asadizanjani, and D. Kazmer, "Coded Acoustic Wave Modulation for Multi-Parameter Transmission", *Proc. IEEE International Instrumentation and Measurement Technology Conference*, pp. 2236-2241, Graz, Austria, May, 2012.

90) Z. Han, R. Gao, and Z. Fan, "Occupancy and Indoor Environment Quality Sensing for Smart Buildings", *Proc. IEEE International Instrumentation and Measurement Technology Conference*, pp. 882-887, Graz, Austria, May, 2012.

91) L. Tao, S. Liu, L. Mo, and R. Gao, "Optimal battery charge and discharge control scheme under solar power inflow", *Proc. IEEE International Instrumentation and Measurement Technology Conference*, pp. 849-854, Graz, Austria, May, 2012.

92) M. Ng, R. Fan, R. Zhou, E. Smith, R. Gao, and J. Cao, "Micro surface-texturing by electrically assisted micro-rolling (EAμR)", *Proc. 7th International Conference on MicroManufacturing* (ICOMM), Northwestern University, Evanston, IL, March, 2012.

93) R. Gao, Z. Fan, N. Asadisanjani, and D. Kazmer, "A new method for determining melt front velocity through temperature measurement", *Proc. ASME Dynamic Systems and Control Conference*, pp. 1-6, Arlington, VA, October, 2011.

94) Z. Fan and R. Gao, "Speed improvement in electrical capacitance tomography through a multiple excitation and receiving method", *Proc. ASME Dynamic Systems and Control Conference*, pp. 7-12, Arlington, VA, October, 2011.

95) L. Mo, S. Liu, R. Gao, D. John, J. Staudenmayer, and P. Freedson, "ZigBee-Based wireless multi-sensor system for physical activity assessment", *Proc. IEEE International Conference on Engineering in Medicine and Biology Society*, pp. 846-849, Boston, MA, August, 2011.

96) S. Liu, R. Gao, D. John, J. Staudenmayer, and P. Freedson, "SVM-based multi-sensor fusion for free-living physical activity assessment", *Proc. IEEE International Conference on Engineering in Medicine and Biology Society*, pp. 3188-3191, Boston, MA, August, 2011.

97) J. Wang, R. Gao, and R. Yan, "Broken-rotor-bar diagnosis for induction motors", *Proc. 9th International Conference on Damage Assessment*, pp. 1-10, Oxford, UK, July, 2011.

98) S. Sah, R. Gao, and T. Kurp, "Model-augmented methods for estimation of contact pressure distribution", Proc. 39th North American Manufacturing Research Conference (NAMRI), Corvallis, OR, paper #4789, 2011.

99) R. Yan and R. Gao, "Impact of wavelet basis on vibration analysis for rolling bearing defect diagnosis", *Proc. IEEE International Instrumentation and Measurement Technology Conference*, pp. 393-396, Zhejiang, China, 2011.

100) R. Yan, Y. Qian, Z. Huang, and R. Gao, "Rolling bearing defect severity evaluation using recurrence plot entropy", *Proc. IEEE International Instrumentation and Measurement Technology Conference*, pp. 150-153, Zhejiang, China, 2011.

101) S. Liu, R. Gao and P. S. Freedson, "Non-invasive respiration and ventilation prediction using a single abdominal sensor belt," *2011 IEEE Signal Processing in Medicine and Biology Symposium (SPMB)*, pp. 1-5, Brooklyn, NY, December, 2011.

102) W. Tian, R. Yan and R. Gao, "A hybrid diagnostic method based on wigner-ville distribution and wavelet packet transform*," 2010 International Conference on Wavelet Analysis and Pattern Recognition*, pp. 386-391, Qingdao, China, July, 2010.

103) S. Sah, R. Gao, and T. Kurp, "Spatial blending functions for improved estimation of contact pressure distribution at the tool-workpiece interface", *Proc. 2010 ASME International Manufacturing Science and Engineering Conference*, paper # MSEC2010-34107, Erie, PA, 2010.

104) R. Yan, Y. Liu, and R. Gao, "A nonlinear time series analysis method for health monitoring of rolling bearings", *Proc. ASME 3rd Annual Dynamic Systems and Control Conference*, pp. 277-283, Cambridge, MA, 2010.

105) S. Sah and R. Gao, "3D Interpolation techniques for analysis of contact pressure on tool-workpiece interfaces", *Proc. 2010 ASME International Symposium on Flexible Automation* (ISFA), paper # UPL-2506, Tokyo, Japan, 2010.

106) S. Liu, R. Gao, and P. Freedson, "Design of a wearable multi-sensor system for physical activity assessment", *Proc. 2010 IEEE/ASME International Conference on Advanced Intelligent Mechantronics* (AIM), pp. 254-259, Montreal, Canada, 2010.

107) Z. Fan, R. Gao, and D. Kazmer, "Design of a self-energized wireless sensor for simultaneous pressure and temperature measurement", *Proc. 2010 IEEE/ASME International Conference on Advanced Intelligent Mechantronics* (AIM), pp. 1168-1173, Montreal, Canada, 2010.

108) T. Kurp, R. Gao, and S. Sah, "An adaptive sampling scheme for improved energy utilization in wireless sensor networks", *Proc. IEEE International Instrumentation and Measurement Technology Conference*, pp. 93-98, Austin, TX, May, 2010.

109) Z. Fan and R. Gao, "A new sensing method for electrical capacitance tomography", *Proc. IEEE International Instrumentation and Measurement Technology Conference*, Austin, TX, May, 2010.

110) A. Kadrolkar and R. Gao, "Variable word length coding for energy-efficient signal transmission", *Proc. IEEE International Instrumentation and Measurement Technology Conference*, pp. 87-92, Austin, TX, May, 2010.

111) R. Yan and R. Gao, "Design of an impulse wavelet for structural defect identification", *Proc. IEEE Prognostics & System Health Management Conference*, pp. 1-6, Macau, China, January, 2010.

112) Q. He, R. Yan, and R. Gao, "Wavelet packet base selection for gearbox defect severity classification", *Proc. IEEE Prognostics & System Health Management Conference*, pp. 1-5, Macau, China, January, 2010.

113) S. Sah and R. Gao, "Integrated sensing of pressure distribution at the workpiece-tool interface in sheet metal stamping", *Proc. ASME International Manufacturing Science and Engineering Conference*, paper # MSEC2009-84342, Purdue University, West Lafayette, IN, October, 2009.

114) S. Sheng and R. Gao, "Multi-Time Scale modeling strategy for bearing life prognosis", *Proc. ASME Dynamic Systems and Control Conference*, paper # DSCC2009-2680, Hollywood, CA, October, 2009.

115) Z. Fan, R. Gao, and D. Kazmer, "Self-energized acoustic wireless sensor for pressure-temperature measurement in injection molding cavity", *Proc. IEEE Sensors Conference*, pp. 65-68, Christchurch, New Zealand, October, 2009.

116) R. Yan and R. Gao, "Information theoretic measure for wavelet selection in non-stationary vibration analysis", *Proc. 7th International Workshop on Structural Health Monitoring*, pp. 1202-1209, Stanford University, San Francisco, CA, September, 2009.

117) J. Zhang, R. Yan, R. Gao, and Z. Feng, "Position-sensitivity analysis of the EMD algorithm", Proc. 7th International Workshop on Structural Health Monitoring, pp. 1405-1412, Stanford University, San Francisco, CA, September, 2009.

118) S. Liu, R. Gao, Q. He, J. Staudenmayer, and P. Freedson, "Development of statistical regression models for ventilation estimation", Proc. 31st Annual International Conference of the IEEE Engineering in Medicine and Biology Society, pp. 1266-1269, Minneapolis, MN, September, 2009.

119) Q. He, R. Gao, and P. Freedson, "Midpoint-based Empirical Decomposition for nonlinear trend estimation", Proc. 31st Annual International Conference of the IEEE Engineering in Medicine and Biology Society, pp. 2228-2231, Minneapolis, MN, September, 2009.

120) R. Yan and R. Gao, "Wavelet selection for bearing defect diagnosis", Proc. 8th International Conference on Damage Assessment of Structures, Beijing, China, Key Engineering Materials, Switzerland, Vols. 413-414, pp. 575-582, August, 2009.

121) J. Zhang, R. Yan and R. Gao, "Ensemble Empirical Mode Decomposition for machine health diagnosis", Proc. 8th International Conference on Damage Assessment of Structures, Beijing, China, Key Engineering Materials, Switzerland, Vols. 413-414, pp. 167-174, August, 2009.

122) C. Yeh and R. Gao, "An energy-efficient node activation scheme for reconfigurable sensor networks", Proc. 2008 ASME International Mechanical Engineering Congress and Exposition, paper # IMECE2008-66987, Boston, MA, November, 2008.

123) R. Yan, R. Gao, K. Lee, and S. Fick, "Local geometric projection-based noise reduction for vibration signal analysis in rolling bearings", Proc. 2008 ASME International Mechanical Engineering Congress and Exposition, paper # IMECE2008-66937, Boston, MA, November, 2008.

124) R. Panchal, D. Kazmer, and R. Gao, "Design and validation of an in-mold shrinkage sensor", Proc. 2008 ASME International Mechanical Engineering Congress and Exposition, paper # IMECE2008-66400, Boston, MA, November, 2008.

125) Z. Fan, R. Gao, and D. Kazmer, "Design and evaluation of a modulator circuit for a self-energized wireless sensor", Proc. 2008 ASME International Mechanical Engineering Congress and Exposition, paper # IMECE2008-67848, Boston, MA, November, 2008.

126) C. Yeh and R. Gao, "Reconfigurable energy-efficient wireless sensor networks for real-time data acquisition", Proc. IEEE Industrial Electronics Society (IECON 2008), pp. 2623-2628, Orlando, FL, November, 2008.

127) A. Kardrolkar and R. Gao, "Statistical analysis of symbol sequence distributions for machine condition monitoring", Proc. IEEE Industrial Electronics Society (IECON 2008), pp. 1925-1930, Orlando, FL, November, 2008.

128) R. Yan, R. Gao, L. Zhang, and K. Lee, "Modal parameter identification from output-only measurement data: application to operating spindle condition monitoring", Proc. The 8th International Conference on Frontiers of Design and Manufacturing, Paper No. 61, Tianjin, China, September, 2008.

129) S. Liu, Q. He, R. Gao, and P. Freedson, "Empirical mode decomposition applied to tissue artifact removal from respiratory signal", Proc. 30th Annual International Conference of the IEEE Engineering in Medicine and Biology Society, pp. 3624-3627, Vancouver, British Columbia, Canada, August, 2008.

130) D. O. Kazmer, S. Velusamy, S. Westerdale, S. Johnston, and R. Gao, "A Comparison of Seven Transfer Methods for Velocity to Pressure Switchover," Proc. Society of Plastic Engineers Annual Technical Conference, Injection Molding Division, Vol. 54, pp. 337-341, Milwaukee, WI, May, 2008.

131) S. Johnston, D. O. Kazmer, and R. Gao, "In-Mold Temperature and Pressure Sensors for On-Line Detection of Jetting," Proc. Society of Plastic Engineers Annual Technical Conference, Process Monitoring, Instrumentation, and Control Special Interest Group, Vol. 54, pp. 2376-2380, May, Milwaukee, WI, 2008.

132) S. Sah and R. Gao, "An embedded pressure sensing approach for stamping process monitoring", Proc. 2007 ASME International Mechanical Engineering Congress and Exposition (IMECE), paper # IMECE2007-42190, Seattle, WA, November, 2007.

133) R. Gao, L. Zhang, R. Yan, and K. Lee, "Condition monitoring of operating spindle based on stochastic subspace identification", Proc. 2007 ASME International Mechanical Engineering Congress and Exposition, paper # IMECE2007-41988, Seattle, WA, November, 2007.

134) Z. Fan, M. Hamid, R. Gao, S. Johnston, and D. Kazmer, "Structural Optimization of a Dual Sensing Module for Temperature and Pressure Measurement in Injection Molding Cavity, " Proc.

2007 ASME International Mechanical Engineering Congress and Exposition, paper # IMECE2007-42250, Seattle, WA, November, 2007.

135) N. Mahayotsanun, S. Sah, J. Cao, M. Peshkin, R. Gao, and C.T. Wang, "Integrated sensing system for stamping monitoring and control", Proceedings of the IEEE Sensors 2007 Conference, pp. 1376-1379, Atlanta, Georgia, October, 2007.

136) R. Yan and R. Gao, "Wavelet-based multi-fractal spectrum for machine defect detection", Proc. 2007 ASME International Mechanical Engineering Congress and Exposition (IMECE), paper # IMECE2007-41984, Seattle, WA, November, 2007.

137) R. Gao and R. Yan, "Wavelet packet transform-based hybrid signal processing for machine health monitoring and diagnosis, Proc. 6th International Workshop on Structural Health Monitoring, Vol. 1, pp. 598-605, Stanford University, September, 2007.

138) R. Yan and R. Gao, "Complexity measure: a nonlinear time series analysis technique for machine health monitoring", Proc. 6th International Workshop on Structural Health Monitoring, Stanford University, Vol. 2, pp. 1291-1298, September, 2007.

139) C. Yeh, Z. Fan, and R. Gao, "Energy-aware data acquisition in wireless sensor networks", Proc. IEEE Instrumentation and Measurement Technology Conference, paper #7535, Warsaw, Poland, May, 2007.

140) L. Zhang, R. Yan, R. Gao, and K. Lee, "Open architecture software design for automated spindle health monitoring", Proc. IEEE Instrumentation and Measurement Technology Conference, paper #7551, Warsaw, Poland, May, 2007.

141) S. Johnston, D. Kazmer, Z. Fan, and R. Gao, "Causes of melt temperature variations observed in the nozzle during injection molding, Proc. Annual Technical Conference (ANTEC), Society of Plastics Engineers, pp. 2012 – 2017, Cincinnati, OH, May, 2007.

142) S. Johnston, D. Kazmer, Z. Fan, and R. Gao, "Estimation of bulk melt temperature from in-mold sensor: Part 2 – convection", Proc. Annual Technical Conference (ANTEC), Society of Plastics Engineers, pp. 2089 – 2094, Cincinnati, OH, May, 2007.

143) Z. Fan and R. Gao, "A dual sensing approach to simultaneous temperature and pressure measurement from injection molding cavity", Proc. 2006 ASME International Mechanical Engineering Congress and Exposition (IMECE), Symposium on Intelligent Systems, paper # IMECE2006-13944, Chicago, IL, November, 2006.

144) R. Gao, Z. Fan, and D. Kazmer, "Design of an acoustic transmitter for temperature-pressure dual sensing in injection molding", *Proc. 2006 IEEE Sensors Conference*, paper # IEEE1478, Daegu, Korea, October, 2006.

145) Z. Fan, R. Gao, and L. Wang, "Architectural design of a sensor-to-web interface for remote machine condition monitoring and control", *Proc. 2006 International Symposium on Flexible Automation* (ISFA), pp. 166-172, Osaka, Japan, July, 2006.

146) S. Sheng and R. Gao, "Optimization of ANFIS with applications in machine defect severity classification", IEEE World Congress on Computational Intelligence, pp. 728-734, Vancouver, Canada, July, 2006.

147) R. Gao, C. Wang, R. Yan, and A. Malhi, "A Neural Network Approach to Bearing Health Assessment", IEEE World Congress on Computational Intelligence, pp. 1878-1885, Vancouver, Canada, July, 2006.

148) D. Ball, R. Yan, R. Gao, and A. Deshmukh, "Optimal decomposition of large scale sensor networks for energy efficient sensing", The 7th International Conference on Frontiers of Design and Manufacturing, Vol. 3, pp. 167-172, Guangzhou, China, June, 2006.

149) S. Johnston, D. Kazmer, and R. Gao, "Estimation of melt temperature from in-mold temperature sensor data," Society of Plastic Engineers Annual Technical Conference, Processing Monitoring & Control Special Interest Group, pp. 2392-2397, Charlotte, NC, May, 2006.

150) R. Frenkel and R. Gao, "Ultrasound pulse coding for robust obstacle detection using a long cane", IEEE Instrumentation and Measurement Technology Conference, pp. 1251-1256, Sorrento, Italy, April, 2006.

151) R. Gao and T. Boscardin, "Design of a test bed for performance evaluation in a wireless sensor network", IEEE Instrumentation and Measurement Technology Conference, pp. 341-346, Sorrento, Italy, April, 2006.

152) R. Gao, A. Deshmukh, R. Yan, and Z. Fan, "Energy efficient wireless sensor network for dynamic system monitoring", SPIE International Symposium on Intelligent Systems in Design and Manufacturing, Vol. 5999, paper #5999-04, Boston, MA, October, 2005 (invited).

153) R. Gao and R. Yan, "A hybrid signal processing technique for bearing defect severity estimation", World Tribology Congress III, paper # WTC2005_63552, Washington, D.C., September, 2005.

154) R. Yan and R. Gao, "Multi-scale enveloping spectrogram for bearing defect detection", World Tribology Congress III, paper # WTC2005_63541, Washington, D.C., September, 2005.

155) R. Yan and R. Gao, "Transient signal analysis based on Hilbert-Huang transform", IEEE Instrumentation and Measurement Technology Conference, Vol. 2, pp. 1198-1202, Ottawa, Canada, May, 2005.

156) L. Zhang, R. Gao, and K. Lee, "Wavelet-based enveloping for spindle health diagnosis", *IEEE Instrumentation and Measurement Technology Conference,* Vol. 2, pp. 1203-1208, Ottawa, Canada, May, 2005.

157) Z. Fan and R. Gao, "Architectural design of a sensory-node-controller for sensor network", *IEEE Instrumentation and Measurement Technology Conference,* Vol. 1, pp. 311-316, Ottawa, Canada, May, 2005.

158) D. Kazmer, R. Gao, Y. Cui, S. Johnston, and P. Knepper, "Concept design of a wireless pressure, temperature, and flow rate sensor for injection molding," Society of Plastic Engineers Annual Technical Conference, Processing Monitoring & Control Special Interest Group, pp. 320-324, Boston, MA, May, 2005.

159) Y. Su, A. Wolczowski, M. Fisher, G. Bell, D. Burn, and R. Gao, "Towards an EMG controlled prosthetic hand using a 3D electromagnetic positioning system", *IEEE Instrumentation and Measurement Technology Conference,* Vol. 1, pp. 261-266, Ottawa, Canada, 2005.

160) R. Yan and R. Gao, "Generalized harmonic wavelet as an adaptive filter for machine system health diagnosis", SPIE International Symposium on Sensors and Smart Structures Technologies for Civil, Mechanical and Aerospace Systems, pp. 786-793, San Diego, CA, March, 2005.

161) Y. Cui and R. Gao, "Energy efficiency analysis of a self-powered acoustic wireless pressure sensor: a bond graph approach", SPIE International Symposium on Sensors and Smart Structures Technologies for Civil, Mechanical and Aerospace Systems, pp. 167-175, San Diego, CA, March, 2005.

162) Z. Fan and R. Gao, "An energy-efficient data processing scheme for wireless sensor networks", SPIE International Symposium on Sensors and Smart Structures Technologies for Civil, Mechanical and Aerospace Systems, pp. 226-235, San Diego, CA, March, 2005.

163) R. Gao and Y. Cui, "Vibration-based energy extraction for sensor powering: design, analysis, and experimental evaluation", SPIE International Symposium on Sensors and Smart Structures Technologies for Civil, Mechanical and Aerospace Systems, pp. 794-801, San Diego, CA, March, 2005.

164) T. Boscardin, S. Cai, R. Gao, and W. Gong, "Energy efficient MAC protocol for condition monitoring sensor networks", 43rd IEEE Conference on Decision and Control, pp. 1487-1501, Atlantis, Bahamas, December, 2004 (invited).

165) S. Sheng and R. Gao, "An adaptive neuro-fuzzy inference system for bearing condition monitoring", ASME International Mechanical Engineering Congress and Exposition (IMECE), Symposium on Intelligent Systems, pp. 663-670, Anaheim, CA, November, 2004.

166) S. Sheng, and R. Gao, "Architectural effect on ANFIS for machine condition assessment." *Proceedings of the ASME 2004 International Mechanical Engineering Congress and Exposition. Dynamic Systems and Control, Parts A and B*. pp. 663-670, Anaheim, CA, November, 2004.

167) S. Sheng and R. Gao, "Structural dynamics-based sensor placement strategy for high quality sensing", IEEE Sensors Conference, pp. 642-645, Vienna, Austria, October, 2004.

168) R. Yan, D. Ball, A. Deshmukh, and R. Gao, "A Bayesian network approach to energy-aware distributed sensing", IEEE Sensors Conference, pp. 44-47, Vienna, Austria, October, 2004.

169) R. Yan and R. Gao, "Enhanced signal demodulation for machine health diagnosis", 2004 Japan-USA Symposium on Flexible Automation, paper # UL_074, Denver, CO, July, 2004.

170) R. Yan and R. Gao, "Harmonic wavelet packet transform: a new approach to machine condition monitoring and health evaluation", International Conference on Flexible Automation and Intelligent Manufacturing, pp. 42-49, Toronto, Canada, July, 2004.

171) R. Yan, R. Gao, and A. Deshmukh, "Energy efficient sensing based on hierarchically organized Bayesian networks", The 6th International Conference on Frontiers of Design and Manufacturing, paper # 449, Xi'An China, June, 2004.

172) A. Malhi and R. Gao, "Recurrent neural networks for long-term prediction in machine condition monitoring", IEEE Instrumentation and Measurement Technology Conference, Vol. 3, pp. 2048-2053, Como, Italy, May, 2004.

173) R. Yan and R. Gao, "Machine health diagnosis based on approximate entropy", IEEE Instrumentation and Measurement Technology Conference, Vol. 3, pp. 2054-2059, Como, Italy, May, 2004.

174) R. Yan and R. Gao, "Harmonic wavelet packet transform for on-line system health diagnosis", SPIE International Symposium on Sensors and Smart Structures Technologies for Civil, Mechanical and Aerospace Systems, pp. 512-522, San Diego, CA, March, 2004.

175) R. Gao, D. Kazmer, L. Zhang, C. Theurer, and Y. Cui, "Self-powered sensing for mechanical system condition monitoring", SPIE International Symposium on Sensors and Smart Structures Technologies for Civil, Mechanical and Aerospace Systems, pp. 321-330, San Diego, CA, March, 2004.

176) R. Gao, C. Wang, and S. Sheng, "Optimal sensor placement strategy and sensor design for high quality system monitoring", SPIE International Symposium on Sensors and Smart Structures Technologies for Civil, Mechanical and Aerospace Systems, pp. 431-440, San Diego, CA, March, 2004.

177) R. Yan and R. Gao, "A hybrid signal processing approach to sensor data analysis", ASME International Mechanical Engineering Congress and Exposition (IMECE), Symposium on Intelligent Sensors and Sensor Networks, paper# IMECE2003-42586, pp. 1159-1166, Washington, D.C. November, 2003.

178) C. Theurer, L. Zhang, D. Kazmer, and R. Gao, "Evaluation of a piezoelectric energy extraction device for cavity pressure sensing in injection molding", ASME IMECE, Symposium on Intelligent Sensors and Sensor Networks, paper# IMECE2003-42675, pp. 1167-1173, Washington, D.C. November, 2003.

179) S. Sheng and R. Gao, "A wavelet-based fuzzy data fusion scheme for bearing defect severity classification", ASME IMECE, Symposium on Intelligent Sensors and Sensor Networks, paper# IMECE2003-42584, pp. 1285-1292, Washington, D.C. November, 2003.

180) R. Gao, J. Lee, S. Cowan, and K.F. Lee, "Comparative study of spine fixation techniques", ASME IMECE, Symposium on Biomedical Engineering, Biomechanics, paper# IMECE2003-42195, pp. 363-364, Washington, D.C., November, 2003.

181) R. Yan and R. Gao, "Complexity as a measure for machine fault detection and diagnosis", IEEE Instrumentation and Measurement Technology Conference, Vol. 1, pp. 65-70, Vail, CO, May, 2003.

182) A. Malhi and R. Gao, "Feature selection for defect classification in machine condition monitoring", IEEE Instrumentation and Measurement Technology Conference, Vol. 1, pp. 36-41, Vail, CO, May, 2003.

183) D. Kazmer, R. Gao, C. Theurer, and L. Zhang, "Wireless pressure sensor for injection molding", 61st Society of Plastics Engineers Annual Technical Conference, Sensors & Monitoring Special Interest Group, Vol. VLIX, pp. 3290-3294, Nashville, TN, May, 2003.

184) C. Theurer, L. Zhang, R. Gao, and D. Kazmer, "Threshold energy switching and its application to wireless sensing in high energy manufacturing process", ASME International Mechanical Engineering Congress and Exhibition, Symposium on Intelligent Sensors and Sensor Networks, New Orleans, LA, November, 2002.

185) M. Mitchell, R. Gao, S. Cowan, and K.F. Lee, "Evaluation of lumbar spine stabilization using anterior interbody fusion cage", ASME International Mechanical Engineering Congress and Exhibition, Symposium on Biomedical Engineering, Orthopedic Implants, New Orleans, LA, November, 2002.

186) R. Gao and C. Wang, "Wireless sensor for bearing condition monitoring: design considerations", The 6th World Multiconference on Systemics, Cybernetics, and Informatics, Vol. XV. pp. 367-372, Orlando, FL, July, 2002 (invited).

187) C. Theurer, L. Zhang, R. Gao, and D. Kazmer, "Self-energized wireless pressure sensor using energy extraction from injection mold pressure differential", IEEE Sensors Conference, Vol. 2, pp. 942-949, Orlando, FL, June, 2002.

188) R. Luharuka, R. Gao, S. Krishnamurty, "A microcontroller-based data logger for physiological sensing", IEEE Instrumentation and Measurement Technology Conference, Vol. 1, pp. 175-180, Anchorage, AK, May, 2002.

189) C. Wang and R. Gao, "Wavelet transform with spectral post-processing for enhanced feature extraction", IEEE Instrumentation and Measurement Technology Conference, Vol. 2, pp. 1301-1305, Anchorage, AK, May, 2002.

190) A. Suryavanshi, S. Wang, R. Gao, K. Danai, and D. Lewicki, "Condition monitoring of helicopter gearboxes by embedded sensing", Annual Forum and Technology Display of the American Helicopter Society, Symposium of the Health and Usage Monitoring Systems (HUMS), Montreal, Canada, June, 2002.

191) K. Lee, R. Gao, and R. Schneeman, "Sensor network and information interoperability – integrating IEEE 1451 with MIMOSA and OSA-CBM", IEEE Instrumentation and Measurement Technology Conference, Vol. 1, pp. 315-320, Anchorage, AK, May, 2002.

192) R. Gao and A. Suryavanshi, "Mechatronic design and vibration analysis of bearing-integrated sensor module", 5th International Conference on Frontiers of Design and Manufacturing, Vol. 1, pp. 452-460, Da Lian, China, July, 2002.

193) L. Zhang, C. Theurer, R. Gao, and D. Kazmer, "Design of a wireless sensor for injection molding cavity pressure measurement", ASME International Mechanical Engineering Congress and Exhibition, International Symposium on Intelligent Sensors, paper #DSC-24500, pp. 1-7, New York, NY, November, 2001.

194) R. Gao and A. Suryavanshi, "BIT for intelligent system design and condition monitoring", IEEE Instrumentation and Measurement Technology Conference, Vol. 3. pp. 1519-1524, Budapest, Hungary, May 21-23, 2001.

195) R. Gao and P. Huenerberg, "CDMA-based wireless data transmitter for embedded sensors", IEEE Instrumentation and Measurement Technology Conference, Vol. 3, pp. 1778-1783, Budapest, Hungary, May 21-23, 2001.

196) A. Suryavanshi and R. Gao, "Vibration analysis of a bearing integrated sensor module", SPIE International Symposium on Intelligent Systems and Advanced Manufacturing, Vol. 4653, pp. 75-83, Boston, MA, March, 2001.

197) C. Theurer, L. Zhang, R. Gao, and D. Kazmer, "Acoustic telemetry in injection molding", Society of Plastics Engineers Annual Technical Conference, Process Monitoring and Control Division, Vol. 51, No. 3, pp. 208-213, New York, NY, May, 2001.

198) J. Terpenny, R. Gao, J. Ritter, D. Fisher, and S. Krishnamurty, "Senior design projects to aid the disabled", ASEE Annual Conference and Exposition, Session # 2325 - Innovation in Design Education I, paper # 1760, Albuquerque, NM, June, 2001.

199) C. Wang and R. Gao, "Signal distortion compensation of linear time-invariant measurement system", ASME International Mechanical Engineering Congress and Exhibition, DSC-Vol. 69, pp. 99-104, Orlando, FL, November, 2000.

200) S. Uppala, R. Gao, S. Cowan, and K.F. Lee, "A biomechanical model of lumbar spine", ASME International Mechanical Engineering Congress and Exhibition, DSC-Vol. 69, pp. 43-48, Orlando, FL, November, 2000.

201) C. Wang and R. Gao, "Sensor placement strategy for in-situ bearing defect detection", IEEE Instrumentation and Measurement Technology Conference, pp. 1463-1467, Baltimore, MD, May, 2000.

202) X. Cai, and R. Gao, "Data fusion for obstacle identification using ultrasonic sensing," *Proceedings of the 17th IEEE Instrumentation and Measurement Technology Conference*, Vol. 2, pp. 834-838, Baltimore, MD, May, 2000.

203) R. Gao, and S. Sovenyi, "A hybrid instrument for a vibration test bed with built-in-test capability," *Proceedings of the 17th IEEE Instrumentation and Measurement Technology Conference*, Vol. 3, pp. 1397-1402, Baltimore, MD, May, 2000.

204) C. Wang, and R. Gao, "Design of a sensor module for integrated bearing condition monitoring," *Proceedings of ASME International Mechanical Engineering Congress and Exposition, Dynamic Systems and Control Division*, pp.721-728, Nashville, TN, 1999.

205) C. Wang and R. Gao, "Sensor module for integrated bearing condition monitoring", ASME International Mechanical Engineering Congress and Exposition, Dynamic Systems and Control Division, DSC-Vol. 67, pp. 721-728, Nashville, TN, November, 1999.

206) X. Cai and R. Gao, "Sensor placement strategy for a long cane as a trave aid for the blind", ASME International Mechanical Engineering Congress and Exposition, Dynamic Systems and Control Division, DSC-Vol. 67, pp. 597-604, Nashville, TN, November, 1999.

207) C. Wang and R. Gao, "Baring defect analysis using combined wavelet and Fourier transformation", 10th International Conference on Signal Processing Applications & Technology, on CD-ROM, paper #421, Orlando, FL, November, 1999.

208) X. Cai and R. Gao, "In-situ optimal data integration and evaluation from long cane-embedded multiple sensors", 10th International Conference on Signal Processing Applications & Technology, on CD-ROM, paper #422, Orlando, FL, November, 1999.

209) C. Wang and R. Gao, "Virtual instrumentation for integrated bearing condition monitoring", IEEE Instrumentation and Measurement Technology Conference, Vol. 2, pp. 667-672, Venice, Italy, May, 1999.

210) B. Holm-Hansen and R. Gao, "Time-scale analysis adapted for bearing diagnostics", SPIE's International Symposium on Intelligent Systems and Advanced Manufacturing, Boston, MA, September, 1999.

211) R. Gao and X. Cai, "Mechatronic long cane as a travel aid for the blind", SPIE International Symposium on Sensors and Controls for Intelligent Machining, Agile Manufacturing, and Mechatronics, Vol. 3518, pp. 220-226, Boston, MA, November, 1998.

212) R. Gao, B. Holm-Hansen, and C. Wang, "Design of a mechatronic bearing through sensor integration", SPIE International Symposium on Sensors and Controls for Intelligent Machining, Agile Manufacturing, and Mechatronics, Vol. 3518, pp. 244-250, Boston, MA, November, 1998.

213) R. Gao and P. Sahay, "Miniaturized sensor module for a mechatronic bearing", SPIE International Symposium on Sensors and Controls for Intelligent Machining, Agile Manufacturing, and Mechatronics, Vol. 3518, pp. 238-243, Boston, MA, November, 1998.

214) B. Holm-Hansen and R. Gao, "Multiple defect analysis of a sensor integrated ball bearing", 1998 ASME IMECE, Dynamic Systems and Control Division, DSC-Vol. 64, pp. 9-14, Anaheim, CA, November, 1998.

215) R. Gao and P. Sahay, "Structural analysis of a sensor module for the smart bearing", 1998 ASME IMECE, Dynamic Systems and Control Division, DSC-Vol. 64, pp. 615-621, Anaheim, CA, November, 1998.

216) B. Holm-Hansen and R. Gao, "Vibration analysis of a ball bearing with an integrated sensor", Technical Papers of the North American Manufacturing Research Institution of SME, pp. 131-136, Atlanta, GA, May, 1998.

217) S. Pathare, R. Gao, B. Varghese, C. Guo, and S. Malkin, "A DSP-based telemetric data acquisition system for in-process monitoring of grinding operation", IEEE Instrumentation and Measurement Technology Conference), pp. 191-196, St. Paul, MN, May, 1998.

218) R. Gao and X. Cai, "A wireless ranging system as an embedded sensor module for the long cane", IEEE Instrumentation and Measurement Technology Conference (IMTC/98), pp. 547-552, St. Paul, MN, May, 1998.

219) X. Cai and R. Gao, "A microcontroller-based telemetric sensing module for the long cane", The 9th International Conference on Signal Processing Applications & Technology, pp. 183-187, Vol. 1, Toronto, Canada, September, 1998.

220) R. Gao, B. Holm-Hansen, and C. Wang, "Design of a mechatronic bearing through sensor integration", SPIE International Symposium on Sensors and Controls for Intelligent Machining, Agile Manufacturing, and Mechatronics, Vol. 3518, pp. 244-250, Boston, MA, November, 1998.

221) B. Holm-Hansen and R. Gao, "Smart bearing utilizing embedded sensors: design considerations", SPIE 4th International Symposium on Smart Structures and Materials, Vol. 3041, pp. 602-610, San Diego, CA, March, 1997.

222) V. Khanna, and R. Gao "Design of ultrasonic transducers with improved lateral resolution for medical imaging", *Proceedings SPIE, Medical Imaging: Ultrasonic Transducer Engineering*, Newport Beach, CA, 1997.

223) B. Holm-Hansen and R. Gao, "Monitoring of loading status inside rolling element bearings through electromechanical sensor integration", 1997 ASME IMECE, Dynamic Systems and Control Division, pp. 329 - 335, Dallas, TX, November, 1997.

224) X. Cai, E. Zhang, and R. Gao, "A new approach to improve the testing accuracy of ball bearing guide," *IEEE Instrumentation and Measurement Technology Conference Sensing, Processing, Networking. IMTC Proceedings*, Vol. 2, pp. 1036-1040, Ottawa, ON, Canada, May, 1997.

225) B. Holm-Hansen and R. Gao, "Integrated microsensor module for a smart bearing with on-line fault detection capabilities", IEEE Instrumentation and Measurement Technology Conference, Vol. 2, pp. 1160-1163, Ottawa, Canada, May, 1997.

226) V. Khanna and R. Gao, "Design of ultrasonic transducers with controller radiation patterns", IEEE Instrumentation and Measurement Technology Conference (IMTC/97), Vol. 2, pp. 1466-1471, Ottawa, Canada, May, 1997.

227) V. Khanna and R. Gao, "Ultrasonic transducers with high directivity for underground obstacle detection: design considerations", ASME International Mechanical Engineering Congress and Exposition, Symposium on Recent Advances in Mechanics of Geomaterials, pp. 47-56, Atlanta, GA, November, 1996.

228) H. Gu and R. Gao, "Underground obstacle identification using super resolution technique", 1996 ASME Mechanics & Materials Conference, The Johns Hopkins University, Baltimore, MD, June, 1996.

229) R. Gao, J. Fang, B. Rao, and R. Warrington, "Design and performance evaluation of linear and rotary surface-driven electrostatic microactuators", 1995 IEEE/IAS Conference on Industrial Automation and Control: Emerging Technologies, pp. 572-579, Taipei, Taiwan, May, 1995.

230) R. Gao, J. Fang, and R. Warrington, "Miniaturized surface-driven electrostatic positioners", SPIE International Symposium on Intelligent Systems and Advanced Manufacturing, Microrobotics and Mcromechanical Systems, Vol. 2593, pp. 65-70, Philadelphia, PA, October, 1995.

231) R. Gao and P. Phalakshan, "Design consideration for a sensor-integrated roller bearing", ASME International Mechanical Engineering Congress and Exposition, Symposium on Rail Transportation, pp. 81-86, San Francisco, CA, November, 1995.

232) R. Gao and C. Li, "A dynamic ultrasonic ranging system as a mobility aid for the blind", 17th Annual International Conference of the IEEE Engineering in Medicine and Biology Society, paper# 7.1.8.6., Montreal, Canada, September, 1995.

233) B. Rao and R. Gao, "Temperature modeling for orthogonal diamond machining", ASPE 1995 Winter Annual Meeting, pp. 223-226, Austin, TX, October, 1995.

234) H. Gu and R. Gao, "Super-resolution technique for identifying overlapping echoes", The 6th International Conference on Signal Processing Applications & Technology, pp. 835-839, Boston, MA, October, 1995.

235) C. Li and R. Gao, "Error compensation techniques for a linear inductosyn displacement measurement system", IEEE Instrumentation and Measurement Technology Conference, pp. 364-369, Waltham, MA, April, 1995.

236) B. Rao, R. Gao, C. Rambin, R. Kuppusamy, and R. Warrington, "Finite element and analytical modeling of a surface-driven electrostatic micromotor", ASME 1994 Winter Annual Meeting, Symposium on Micro-Mechanical Systems, Vol. 55-2, pp. 663-670, Chicago, IL, November, 1994.

237) C. Wang and R. Gao, "Design of a piezoelectric actuator for noncircular micromachining", ASME 1994 WAM, Symposium on Sensors for Identification and Control, DSC-Vol. 55-2, pp. 1111-1116, Chicago, IL, November, 1994.

238) R. Gao and C. Li, "Digital signal processing for a microprocessor-based ultrasonic ranging system", The 5th International Conference on Signal Processing Applications & Technology, Vol. 2, pp. 1517-1522, Dallas, TX, October, 1994.

239) R. Gao and C. Friedrich, "Acoustic emission measurement for the in-process minitoring of diamond turning", IEEE Instrumentation and Measurement Technology Conference, pp. 757-760, Hamamatsu, Japan, May, 1994.

240) B. Rao, R. Gao, C. Friedrich and R. Warrington, "On-line determination of cutting geometry through integrated force measurement", IEEE Instrumentation and Measurement Technology Conference, pp. 593-596, Hamamatsu, Japan, May, 1994.

241) B. Rao and R. Gao, "Finite element modeling of ultra-precision machining of copper", 1994 ASPE Annual Meeting, pp. 416-419, Cincinnati, OH, October, 1994.

242) C. Rambin, R. Gao, A. Pal, J. Fang, and R. Warrington, "A Solution procedure for the electrostatic drive analyses of rotary and linear microactuators", ASME 1993 Winter Annual Meeting, DSC-Vol. 46, pp. 97-105, New Orleans, LA, November 28 - December, 1993.

243) Y. Jin, R. Gao, and R. Warrington, "Microcomputer-based real-time bearing monitor", 1993 IEEE Instrumentation and Measurement Technology Conference, pp. 709-714, Irvine, CA, May, 1993.

244) B. Rao, R. Gao, C. Friedrich and R. Warrington, "A mathematical model for on-line measurement of microchannel geometry in diamond-bit-cutting technique", ASPE 8th Annual Meeting, pp. 507-510, Seattle, WA, November, 1993.

245) R. Gao, M. Bhandiwad and R. Warrington, "Applying microelectonic technologies for mechanical process supervision and improvement", ASME 1992 Winter Annual Meeting, DSC-Vol. 40, pp. 119-131, Anaheim, CA, November, 1992.

246) R. Gao, M. Bhandiwad and R. Warrington, "Development of smart grinding balls and smart bearings for on-line process supervision", ASPE 7th Annual Conference, Grenelefe, FL, October, 1992.

247) W. Thelen, R. Gao, and R. Warrington, "Development of smart mechanical components by using microelectronic technologies", 3rd International Conference on Micro, Electro, Opto, Mechanic Systems and Components, pp. 443-453, VDE-Verlag GmbH, Berlin, Germany, 1992.

ABSTRACTS PRESENTED AT CONFERENCES

1) S. Liu, R. Gao, and P. Freedson, "Non-invasive respiration and ventilation prediction using a single abdominal sensor belt", *Proc. IEEE Signal Processing in Medicine and Biology Symposium* (SPMB), New York City, New York, December, 2011.

2) T. Kurp and R. Gao, "Sustainable manufacturing system monitoring through reconfigurable sensing", *2011 INFORMS Northeast Regional Conference*, Amherst, MA, May, 2011 (*invited*).

3) J. Sasaki, S. Liu, D. John, J. Staudenmayer, R. Gao, and P. Freedson, "A novel method to predict activity type and intensity using a multi-sensor device", *2nd International Conference on Ambulatory Monitoring of Physical Activity and Movement (ICAMPAM)*, Glasgow, Scotland, 2011.

4) D. John, S. Liu, J. Sasaki, R. Gao, J. Staudenmayer, and P. Freedson, "Breathing frequency and volume estimations using a multi-sensor integrated measurement system", *2nd International Conference on Ambulatory Monitoring of Physical Activity and Movement*, Glasgow, Scotland, 2011.

5) S. Liu, R. Gao, and P. Freedson, "Design of a wearable multi-sensory system for physical activity assessment", *2nd International Conference on Ambulatory Monitoring of Physical Activity and Movement (ICAMPAM)*, Glasgow, Scotland, May, 2011.

6) J. Sasaki, S. Liu, D. John, J. Staudenmayer, R. Gao, and P. Freedson, "Predicting physical activity type and intensity using accelerometry and ventilation signals from the integrated measurement system," *58th Annual Conference of the American College of Sports Medicine and 2nd World Congress on Exercise is Medicine*, Denver, Colorado, May 31-June 4, 2011.

7) D. John, S. Liu, J. Sasaki, R. Gao, J. Staudenmayer, and P. Freedson, "Ventilation estimates using a single piezoelectric respiration sensor in the indigenous multi-sensor integrated measurement system", *58th Annual Conference of the American College of Sports Medicine and 2nd World Congress on Exercise is Medicine*, Denver, Colorado, May 31-June 4, 2011.

MAGAZINE ARTICLES / TRANSLATION INTO OTHER LANGUAGE

1) R. Yan, R. Zhao, and R. Gao, "Noise-assisted Data Processing in Measurement Science, Part Two", *IEEE Instrumentation and Measurement Magazine*, Vol. 15, No. 6, pp. 32-35, December, 2012.

2) R. Yan, R. Zhao, and R. Gao, "Noise-assisted Data Processing in Measurement Science, Part One", *IEEE Instrumentation and Measurement Magazine*, Vol. 15, No. 5, pp. 41-44, October, 2012.

3) R. Yan and R. Gao, "An introduction to complexity measure: non-linear statistical parameters in measurements", *IEEE Instrumentation and Measurement Magazine*, Vol. 14, No. 5, pp. 27-35, October 2011.

4) R. Yan, Y. Liu, and R. Gao, "Correlation Dimension Analysis: A Non-Linear Time Series Analysis for Data Processing", *IEEE Instrumentation and Measurement Magazine,* Vol. 13, No. 6, pp. 19-25, December, 2010 (*invited*).

5) R. Yan and R. Gao, "Wavelet Transform: A Mathematical Tool for Non-Stationary Signal Processing", *IEEE Instrumentation and Measurement Magazine,* Vol. 12, No. 5, pp. 35-44, October, 2009 (*invited*).

6) R. Yan and R. Gao, "A Tour of the Hilbert-Huang Transform: an Empirical Tool for Signal Analysis", *IEEE Instrumentation and Measurement Magazine,* Vol. 10, No. 5, pp. 40-45, October 2007 (*invited*).

7) R. Gao and L. Zhang, "Micromachined Microsensors for Manufacturing", *IEEE Instrumentation & Measurement Magazine*, Vol. 7, No. 2, pp. 20-26, June, 2004 (*invited*).

8) R. Gao and A. Suryavanshi, "Diagnosis from within the System", *IEEE Instrumentation & Measurement Magazine*, Vol. 5, No. 3, pp. 43-47, September, 2002 (*invited*).

9) B. Varghese, S. Pathare, R. Gao, C. Guo, and S. Malkin, "Monitoramento em Tempo Real com Sensores Integrados ao Rebolo", Maquinas e Metais, Vol. 40, No. 459, pp. 232-245, Portuguese translation of the original paper in English "Development of a Sensor-Integrated 'Intelligent' grinding wheel for In-process monitoring", Brazil, April, 2004.

INVITED PRESENTATIONS

1) Invited Seminar, "Multiphysics Sensing and Hybrid Data Analytics for Smart Manufacturing", Department of Mechanical Engineering, Tsinghua University, China, July 1, 2024.

2) Invited seminar, "Multiphysics Sensing and AI-Enhanced Human-Robot Collaboration for Smart Manufacturing", Distinguished Seminar Series, Department of Mechanical Engineering, University of Colorado Boulder, CO, February 8, 2024.

3) Invited seminar, "Multiphysics Sensing and AI-Enhanced Human-Robot Collaboration for Smart Manufacturing", Distinguished Seminar Series, Department of Mechanical and Materials Engineering, University of Cincinnati, OH, November 17, 2023.

4) Plenary, "Data Science for Intelligent Maintenance", First International Conference on Equipment Intelligent Operation and Maintenance (ICEIOM2023), Hefei, China, September, 2023.

5) Plenary, "Data-Enhanced Mechatronic Systems for Smart Manufacturing", IEEE/ASME International Conference on Advanced Intelligent Mechatronics (AIM), Seattle, WA, June, 2023.

6) Keynote, "Digital Twin for Sustainable Manufacturing", IEEE 14th International Conference on Mechanical and Intelligent Manufacturing Technologies, Cape Town, South Africa, May, 2023.

7) Invited webinar, "Digital Twins for Cyber Physical Systems", Vels Institute of Science, Technology and Advanced Studies, Chennai, India, March, 2023.

8) Keynote, "An AI Pathway towards Sustainable Manufacturing", United Nations Expert Talk Series on "AI for Good", December, 2022.

9) Plenary, "Model-Based and Data-Driven Methods for Cyber Physical Systems Condition Monitoring", Annual Conference of the Society for Machine Failure Prevention Technology (MFPT), Savannah, GA, August, 2022.

10) Invited seminar, "Process-Embedded Sensing and Human-Robot Collaborative Assembly for Advanced Manufacturing", Stephen Malkin Memorial Lecture, Department of Mechanical and Industrial Engineering, University of Massachusetts Amherst, April, 2022.

11) Invited talk, "AI-Enhanced Human Robot Collaborative Assembly", MDPI Applied Sciences Webinar: Challenges and Opportunities for the Design and Development of Human-Centric Systems Towards Industry 5.0, March, 2022.

12) Invited seminar, "Digital Twin for Cyber Physical Systems Modeling and Operation Optimization", Materials Degradation and Lifecycle Engineering Research Center, Case Western Reserve University, March, 2022.

13) Distinguished Research Seminar, "Physics-Based Sensing and Machine Learning for Smart Manufacturing", The Hong Kong Polytechnic University, February, 2022

14) Plenary, "Digital Twin for Cyber Physical Systems Modeling and Operation Optimization", Digital Twin Global Forum (DTGF), January, 2022.

15) Keynote (with N. Fang and D. Hoelzle), "New Challenges for Nano-Manufacturing Research, AI, and Controls", NSF Nanoscale Science and Engineering Grantees Conference, Arlington, VA, December, 2021.

16) Invited seminar, "Multi-Physics Sensing and Machine Learning for Smart Manufacturing", Department of Aerospace and Mechanical Engineering", University of Notre Dame, November, 2021.

17) Plenary, "Data-Augmented Intelligent Sensing", 3rd Symposium of the International Academy of Engineering and Technology (AET), August, 2021.

18) Invited seminar, "Digital Twin for Cyber Physical Systems Modeling and Operation Optimization",

NASA Glenn Research Center, Cleveland, OH, July, 2021.

19) Plenary, "Human-Robot Collaborative Assembly for Smart Manufacturing", IEEE 12th International Conference on Mechanical and Intelligent Manufacturing Technologies (ICMIMT 2021), Cape Town, South Africa, May, 2021.

20) Invited seminar, "Process-Embedded Sensing and Machine Learning for Smart Manufacturing", Department of Mechanical Engineering, Tufts University, April, 2021.

21) Invited seminar, "Process-Embedded Sensing and Machine Learning for Smart Manufacturing", Department of Integrated Systems Engineering, Ohio State University, March, 2021.

22) Invited seminar, "Process-Embedded Sensing and Machine Learning for Smart Manufacturing", Department of Mechanical Engineering, University of Texas at San Antonio, November, 2020.

23) Plenary, "Big Data Analytics for Intelligent Sensing and Measurement", 2020 International Conference on Sensing, Measurement & Data Analytics in the Era of Artificial Intelligence, Xi'an, China, October, 2020.

24) Invited lecture, "Particle Filter-based Stochastic Modeling for Performance Prognosis in Dynamical Systems", Department of Mechanical Engineering, University of Maryland, College Park, MD, November, 2019.

25) Invited seminar, "Machine Learning for Smart Manufacturing", School of Mechanical and Power Engineering, Shanghai Jiaotong University, Shanghai, China, October, 2019.

26) Invited seminar, "Multi-physics Sensing and Machine Learning for Advanced Manufacturing", Leaders in Engineering Lecture, Department of Mechanical, Aerospace, and Nuclear Engineering, Rensselaer Polytechnic Institute, Troy, NY, September, 2019.

27) Keynote, "Machine Learning for Smart Manufacturing", CWRU-Tohoku University Data Science in Life Science and Engineering Collaboration and Symposium, Case Western Reserve University, Cleveland, OH, August, 2019.

28) Keynote, "Process-embedded Sensing and Machine Learning for Smart Manufacturing", 2019 International Conference on Frontiers of Design and Manufacturing, University of Michigan, Ann Arbor, July, 2019.

29) Invited talk, "Process-embedded Sensing and Machine Learning for Smart Manufacturing", Institute for Machine Tools and Production Engineering, RWTH Aachen University, Germany, July, 2019.

30) Invited seminar, "Multi-physics Sensing and Data Analytics for Enhanced Manufacturing Process Monitoring", Distinguished Seminar Series of Mechanical and Aerospace Engineering, University of Buffalo, State University of New York, Buffalo, NY, May, 2019.

31) Invited Seminar, "Machine Learning for Smart Manufacturing", Department of Mechanical Engineering, Tsinghua University, April, 2019.

32) Invited Seminar, "Machine Learning for Smart Manufacturing", Department of Automation and Control, Beihang University, April, 2019.

33) Invited seminar, "Multi-physics Sensing and Data Analytics for Smart Manufacturing", Department of Mechanical Engineering, Southern University of Science and Technology, April, 2019.

34) Invited seminar, "Machine Learning for Smart Manufacturing", School of Mechanical Engineering, Xi'an Jiaotong University, April, 2019.

35) Invited seminar, "Multivariate Sensing for Improved Observability in Manufacturing", Mechanical Engineering, University of Michigan, Ann Arbor, MI, March, 2019.

36) Plenary, "Machine Learning for Enhanced Manufacturing", 48th International Conference on Computers and Industrial Engineering, Auckland, New Zealand, December, 2018.

37) Invited seminar, "Multivariate Sensing for Improved Observability in Manufacturing", Mechanical and Aerospace Engineering, Mechanical and Aerospace Engineering, University of Central Florida, Orlando, FL, September, 2018.

38) Invited talk, "Stochastic Modeling for System Remaining Life Prognosis", Industry Forum, National Institute for Standards and Technology, Gaithersburg, MD, May, 2018.

39) Invited seminar, "Multivariate Sensing for Improved Observability in Manufacturing", Mechanical

and Aerospace Engineering, University of Colorado, Colorado Springs, CO, March, 2018.

40) Keynote speech, "Stochastic Modeling for Predictive Maintenance", 6th International Conference on Through-life Engineering Services, Bremen, Germany, November, 2017.

41) Invited talk, "Deep Learning-based Data Analytics for Pattern Recognition", Sherwin Williams, Cleveland, November, 2017.

42) Invited seminar, "Machine Learning for Intelligent Manufacturing", Distinguished Lecture of the IEEE Instrumentation and Measurement Society, Xi'an Jiaotong University, China, October, 2017.

43) Invited seminar, "Multi-Physics Sensing for Intelligent Manufacturing", *Southeast University*, Nanjing, China, October, 2017.

44) Invited seminar, "Multi-Physics Sensing for Intelligent Manufacturing", *China University of Petroleum*, Beijing, China, October, 2017.

45) Invited talk, "Advanced Sensing for Intelligent Manufacturing", Distinguished Lecture Series of the IEEE Instrumentation and Measurement Society, Twin Cities Chapter of the IEEE Instrumentation and Measurement Society, Minneapolis, MN, September, 2017.

46) Invited talk, "Advanced Sensing for Intelligent Manufacturing", 2017 IEEE Fall Technical Workshop, Minneapolis, MN, September, 2017.

47) Invited talk, "Data Science for Enhanced System Performance Prediction", Air Force Research Lab, Dayton, OH, September, 2017.

48) Invited seminar, "Probabilistic Modeling for System Remaining Life Prognosis", Gas Turbine Laboratory, Ohio State University, Columbus, OH, September, 2017.

49) Invited talk, "Machine Learning: Techniques and Applications", CIRP General Assembly, STC-F Meeting, Lugano, Switzerland, August, 2017.

50) Plenary, "Probabilistic Modeling for System Remaining Life Prognosis", 2nd International Workshop on Probabilistic Prognostics and Health Management of Energy Systems, Lubbock, TX, May, 2017.

51) Invited seminar, "Multiphysics Sensing and Advanced Data Analytics for Smart Manufacturing", Distinguished Seminar Series of Department of Mechanical and Aerospace Engineering, University of Virginia, Charlottesville, VA, March, 2017.

52) Invited seminar, "Multiphysics Sensing and Data Analytics for Smart Manufacturing", Industrial and Manufacturing Engineering, Pennsylvania State University, College Park, PA, February, 2017.

53) Keynote, "From Sensors to Sensor Informatics", 10th International Conference on Sensing Technology, Nanjing (ICST), Nanjing, China, November, 2016.

54) Invited seminar, "Advanced Sensing and Computational Intelligence for Smart Manufacturing", Distinguished Lecture Series of the IEEE Instrumentation and Measurement Society, University of Science and Technology of China (USTC), Hefei, China, November, 2016.

55) Keynote, "Through Life Analysis for Machine Tools: from Design to Remanufacture", 5th International Conference on Through-life Engineering Services, Cranfield, UK, October, 2016.

56) Invited talk, "Stochastic Modeling and Prediction for Improved Data Mining", NIST AMTech Sheet Metal Forming Roadmap, University of New Hampshire, Durham, NH, October, 2016.

57) Invited seminar, "Advanced Sensing and Data Analytics for Smart Manufacturing", Oregon State University, Corvallis, OR, April, 2016.

58) Invited seminar, Process-Embedded Sensing for Smart Manufacturing", Electrical Engineering and Computer Science, Case Western Reserve University, Cleveland, OH, March, 2016.

59) Invited seminar, "Advanced Sensing and Data Analytics for Smart Manufacturing", Northwestern University, Chicago, IL, October, 2015.

60) Invited seminar, "Advanced Sensing and Computational Intelligence for Smart Manufacturing", Distinguished Lecture Series of the IEEE Instrumentation and Measurement Society, University of Manchester and University of Kent, United Kingdom, October, 2015.

61) Keynote, Symposium on Advances in Modeling of Manufacturing Process Mechanisms", Society of Engineering Science Annual Technical Conference, Texas A&M University, October, 2015.

62) Keynote, "Cloud-Based Sensing and Instrumentation for Distributed Measurements", IEEE 2015 International Conference on Electronic Measurement & Instruments, Qingdao, China, July, 2015.

63) Invited seminar, "Advanced Sensing and Computational Intelligent for Smart Manufacturing", Mechanical and Aerospace Engineering, University of California, Los Angeles, CA, May, 2015.

64) Invited seminar, "Frontiers of Sensing and Computational Intelligent for Advanced Manufacturing", Mechanical Engineering, Tsinghua University, Beijing, China, July, 2014.

65) Invited seminar, "Advanced Sensing and Computational Intelligent for Smart Manufacturing", School of Instrument Science and Engineering, Beihang University, Beijing, China, July, 2014.

66) Invited seminar, "Advanced Sensing for Intelligent Manufacturing", School of Mechanical Engineering and Automation, Xi'An Jiaotong University, Xi'An, China, July, 2014.

67) Invited seminar, "Sensing and Signal Processing for Dynamic Systems Monitoring", Department of Mechanical Engineering, Beijing Jiaotong University, Beijing, China, July, 2014.

68) Keynote, "Advanced Mechatronics for Intelligent Manufacturing", International Conference on Mechatronics, Karlstad, Sweden, June, 2014.

69) Invited seminar, "Advanced Sensing and Signal Processing for Intelligent Manufacturing", Royal KTH Institute of Technology, Stockholm, Sweden, June, 2014.

70) Invited seminar, "Intelligent Sensing for Improved Observability in Systems Monitoring", School of Engineering, Case Western Reserve University, May, 2014.

71) Invited seminar, "Multivariate Sensing and Computational Intelligence for Advanced Manufacturing", International Center for Automotive Research, Clemson University, November, 2013.

72) Invited talk, "Advanced Sensing and Instrumentation for Manufacturing", IEEE International Instrumentation and Measurement Technology Conference, Minneapolis, MN, May, 2013.

73) Keynote, "Sensing, Control, and Intelligent Methods for Manufacturing", Third International Symposium on Fundamental Research of Manufacturing Science, Tsinghua University, Beijing, China, July, 2013.

74) Invited seminar, "Recent Advancement in Defect Diagnosis for Rotary Machines", Beijing University of Chemical Technology, Beijing, China, August, 2013.

75) Keynote, "Multivariate Sensing and Intelligent Computation for Process Monitoring and Quality Control", American Society of Quality, Hartford, CT, October, 2012.

76) Keynote, "Advanced Instrumentation and Analytics for Energy Smart Buildings", 4th International Symposium on Test Automation and Instrumentation, Dandong, China, August, 2012.

77) Invited talk, International Workshop on Smart and Resilient Transportation Infrastructure, Virginia Institute of Technology, Blacksburg, VI, April, 2012.

78) Invited seminar, "Advanced Measurement and Computation for Machine Diagnosis, Prognosis, and Health Management", School of Mechanical Engineering and Automation, Xi'An Jiaotong University, Xi'An, China, August, 2012.

79) Invited seminar, "Sensing and Sensor Networks for Process Monitoring", Beijing University of Chemical Technology, Beijing, China, August, 2012.

80) Invited talk, "Advanced Sensing for Improved Observability in Process Control", United Technologies Research Center, East Hartford, CT, May, 2012.

81) Invited talk, "Reconfigurable Sensing for Energy-Efficient System Monitoring", International Workshop on Smart and Resilient Transportation Infrastructure, Virginia Polytechnic Institute of Technology, Blacksburg, VI, April, 2012.

82) Keynote, "Recent Advancement in Measurement Science for Improved Process Observability", IEEE 2011 International Conference on Electronic Measurement & Instruments, Chengdu, China, August, 2011.

83) Invited talk, "Multivariate Sensing and Non-Destructive Evaluation for Dynamic Systems Monitoring and Diagnostics", School of Instrument Science and Engineering, *Southeast University*, Nanjing, China, July, 2010.

84) Distinguished Lecture, "Mechatronic Design and Modeling for Improved Observability of Dynamic

Processes", IEEE Society for Electron Devices, Nanjing Chapter, China, July, 2010.

85) Invited seminar, "Multivariate Sensing and Signal Processing for Process Monitoring and Diagnostics", Department of Precision Engineering and Mechanology, Tsinghua University, Beijing, China, July, 2010.

86) Invited talk, "Multivariate, Wireless Sensing and Signal Processing for Dynamic Systems Monitoring and Diagnostics", Alstom Corporation, Windsor, CT, June, 2010.

87) Fellows Lecture, "Multivariate Sensing and Signal Processing for Dynamic Systems Monitoring and Diagnostics", United Technologies Corporation, East Hartford, CT, May, 2010.

88) Invited talk, "Integrated Sensing for Physical Activity Assessment", in session New Technology to Assess Physical Activity: The NIH Genes and the Environment Initiative, 56th Annual Conference of the American College of Sports Medicine (ACSM), Seattle, WA, May, 2009.

89) Invited talk, "Embedded Sensing and Signal Processing for Machine Health Monitoring and Diagnosis", NASA Stennis Space Center, March, 2009.

90) Invited talk, "Embedded Sensing and Reconfigurable Sensor Networks for System Condition Monitoring", Chinese Academy of Sciences, Institute for Microelectronics, Beijing, China, July, 2008.

91) Invited seminar, "Integrated Sensing for Health Monitoring and Diagnosis in Mechanical Systems", Tsinghua University, Department of Precision Engineering and Mechanology, Beijing, China, December, 2007.

92) Invited seminar, "Reconfigurable Sensor Networks: State of Knowledge and Future Development", Department of Automation and Center for Intelligent and Networked Systems, Tsinghua University, Beijing, China, January, 2007.

93) Invited seminar, "Integrated Sensing for Dynamic System Health Monitoring", University of Connecticut, Department of Mechanical Engineering, November, 2006.

94) Invited talk, "Energy Efficient Wireless Sensor Network for Dynamic System Monitoring", SPIE Symposium on NSF Sponsored Research: Sensors in Manufacturing, Boston, MA, October, 2005.

95) Invited talk, "Energy-Efficient Sensor Networks", INFORMS 2005 Annual Conference, Distributed Sensing Mini-Track, San Francisco, CA, November, 2005.

96) Invited talk, Industrial Engineering Research Conference, session on Optimal Design of Sensor Networks, Atlanta, GA, May, 2005.

97) Invited talk, 5th International Workshop on Advanced Manufacturing Technologies (AMT 2005), National Research Council of Canada, Ontario, Canada, May, 2005.

98) Invited talk, "Energy-efficient Sensors and Sensor Networks", Boston University, Center for Information and Systems Engineering (CISE), Manufacturing Seminar Series, Boston, MA, November 19, 2004.

99) Invited talk, "Sensors and Sensor Networks for Health Monitoring in Machine Systems", National Research Council of Canada, Ontario, Canada, July, 2004.

100) Invited seminar, "Integrated Sensing and Sensor Networks for Health Monitoring in Manufacturing Systems", Tsinghua University, Department of Automation and Center for Intelligent and Networked Systems, Beijing, China, June, 2004.

101) Invited talk, "Design of a Smart Spindle for Smart Machine Tools", Manufacturing Metrology Division, National Institute of Standards and Technology, Gaithersburg, MD, July, 2003.

102) Invited seminar, "Integrated Sensing and Signal Processing for Machine Health Diagnosis", Northeastern University, Department of Mechanical, Industrial, and Manufacturing Engineering, Boston, MA, December, 2003.

103) Invited seminar, "Research in Biomechanics and the Application of Engineering Modeling Techniques", Exercise Science Department, Biomechanics / Motor Control Journal Club, University of Massachusetts, March, 2002.

104) Plenary talk, "State-of-the-Art on Built-in-Test and Self-Test", Plenary Lecture, IEEE Instrumentation and Measurement Technical Conference, Budapest, Hungary, May, 2001.

105) Invited talk, "Neural Networks for Instrumentation, Measurement, and Industrial Applications",

NATO Advanced Study Institute on Neural Networks, sponsored by the IEEE Instrumentation and Measurement Society, Crema, Italy, October, 2001.

106) Invited talk, "Research in Biomechanics and How Engineering Modeling Helps Clinical Research, New England Orthopedic Study Group, September, 2001.

107) Invited seminar, "Mechatronics for Intelligent Manufacturing", Drexel University, Mechanical Engineering and Mechanics, January, 2001.

108) Invited seminar, "Mechatronics for Intelligent Manufacturing and Assistive Technologies", Worcester Polytechnic Institute, MA, February, 2000.

109) Invited talk, "Intelligent Manufacturing", Summer Undergraduate Research Program, University of Massachusetts, July, 2000

110) Invited talk, "Research Themes for the Next Decade: Telecommunications, Nanotechnology, and Bioengineering", Dean's Advisory Council, University of Massachusetts, April 28, 2000.

111) Invited talk, "Assistive Technologies", CAREER Day, Women in Engineering Program, University of Massachusetts, October, 1999.

112) Invited talk, "Mechatronics in Manufacturing", Minority Engineering Student Program, University of Massachusetts, November, 1999.

113) Keynote, "Sensor-embedded Bearing for On-line Machine Condition Monitoring", SKF Corporation 1998 Global Users Conference, Las Vegas, NV, April, 1998.

114) Invited talk, "Design of Smart Electromechanical Systems for Manufacturing Process Monitoring", Kollmorgen Corporation, Northampton, MA, April, 1998.

115) Invited talk, "Development of an Intelligent Grinding Wheel for In-process Monitoring of Ceramic Grinding", Grinding Open House, University of Massachusetts, Amherst, MA, June, 1998.

116) Invited talk, "A Decision Support Framework for MEMS-Based Disability-Assisting Devices", Gordon Research Conference on the Theoretical Foundations for Product Design and Manufacturability, New England College, Henniker, New Hampshire, June, 1998.

117) Invited talk, "Teaching Mechatronics to Mechanical Engineering Students: First Experience", I998 Spring Meeting of the New England Section of ASEE, Amherst, MA, April 24-25, 1998.

118) Invited talk, "MEMS-based Miniaturization for Integrated Machine Condition Monitoring", Beckman Institute Symposium on the Frontiers of Mesoscale Systems and Microfabrication, University of Illinois at Urbana-Champaign, May, 1998.

119) Invited Talk, "Sensor Integrated Bearing", SKF Corporation, San Diego, CA, June, 1998.

120) Invited speaker/participant in NSF Workshops:

    (1)   Workshop on Advanced Manufacturing for Industrial Decarbonization, August, 2023.

    (2)   US-Japan Workshop on Human Centered Data for Resilience, October, 2022.

    (3)   US-Italy Collaborative Research Workshop, Washington D.C., November, 2017.

    (4)   Workshop on Low-Latency Wireless Networks, Washington D.C., November, 2016.

    (5)   Mechatronics Education Innovation Workshop, New York, November, 2016.

    (6)   US-South Korea Workshop on Future Direction of Research, Reno, NV, August, 2014

    (7)   Future Research Needs in Advanced Manufacturing from Industrial Perspective, Arlington, VA, August, 2013

    (8)   Frontiers of Additive Manufacturing Research and Education, Arlington, VA, July, 2013

    (9)   US-Korea Workshop on Advanced Manufacturing, South Korea, May, 2013

    (10)   Proposal Writing Workshop, University of Nebraska-Lincoln, NE, September, 2010.

    (11)   Sensing and Prognostics for Scalability in Nanomanufacturing, Northeastern University, Boston, MA, November, 2009.

    (12)   Cyber-Physical Systems Summit, St. Louis, MO, April, 2008

    (13)   Advanced Intelligent Sensor Technologies for Safe and Secure Societies and Better Quality of Life, Tokyo, Japan, July, 2007

(14) New Frontiers of Dynamic Systems, Arlington, VA, March, 2007.

(15) Cyber Physical Systems, Austin, TX, October, 2006.

(16) Engineered Systems Enabled by Cyber-Infrastructure, St. Louis, MO, July, 2006.

(17) Science and Technologies for Manufacturing Machines and Processes, University of Nebraska, Lincoln, July, 2005.

(18) Critical Review and Assessment of International Research and Development in Manufacturing Sensing and Control, University of Wisconsin-Madison, June, 2003.

(19) Sensors Workshop, University of Maine, November, 2003.

(20) NSF Foundation-wide CAREER Awardees P.I. Meeting on the Integration of Engineering Research and Education, 1999.

(21) CAREER Awardees Workshop on the Integration of Research and Education, Division of Mechanical and Civil Systems, 1998.

121) Invited participant, MEMS Education Workshop, Co-organized by MIT, Stanford, and UCLA, Miami, FL, January, 2005.

122) Invited participant, NIST/NSF Workshop on Smart Machine Tools, December, 2002.

123) Invited participant, Gordon Research Conference on Foundations for Engineering Design and Manufacturing, 1998.

RECENT SPONSORED PROJECTS

(Total funding of approximately $28 M has been received as PI/Co-PI/Senior Personnel at affiliated institutions, with Gao's share exceeding $10M)

Funding Agency	Project	Duration	Role
NIH	ARPA-H: OMEGA: Orchestrating Multifaceted Engineering for Growing Artificial Joints	4/2024 – 3/2029	Co-PI
NSF	ERC: Hybrid Autonomous Manufacturing, Moving from Evolution to Revolution (HAMMER)	9/2022 – 8/2027	Senior Person / Thrust Lead Ctrl. Intel. & Autom.
DOE	Materials Data Science for Stockpile Stewardship Center of Excellence	10/2022- 9/2027	Senior Person
NSF	SCC-IRG: A Manufacturing Approach to Advancing Northeast Ohio	11/2021 – 10/2025	PI
NSF	Energy-based Prognosis for Machining Surface Integrity through ML	8/2021 – 7/2025	PI
NSF	INTERN: Human Robot Collaboration for Smart Factory	9/2020 – 8/2025	PI
NSF	Human Robot Collaboration for Smart Factory	9/2018 - 8/2023	PI
NSF	I/UCRC Planning Grant for Center for Ind. Energy Efficiency	9/2018 - 8/2020	Co-PI
DOE	Industry Assessment Center for Sustainable Production	10/2019 - 9/2022	Co-PI
NSF	Smart & Connected Community Planning Grant	8/2017 - 12/2018	PI
DMDII	Cloud-Enabled Machines with Data-Driven Intelligence	2/2017 - 9/2018	PI
NSF	CyberSEES: Fault Detection, Diagnosis and Prognosis of HVAC	10/2013 - 9/2016	Co-PI
NSF	Spare Parts Inventory Management in Aircraft Engines	3/2013 - 2/2016	Site PI
United Tech. Aerospace System	Complex Hydraulic Housing Optimization	1/2012 - 12/2014	PI

Pratt & Whitney	Advanced Signal Processing for Non-Intrusive Stress Measurement	1/2013 - 12/2015	PI
Pratt & Whitney	Enhanced Electr. Cap. Tomography for Combustion Visualization	1/2011 - 12/2014	PI
NSF	A Cyber Physical Infrastructure for the Smart City	10/2012 - 9/2015	PI
NSF	Electrically Enhanced Precision Microrolling	4/2011 - 3/2014	Site PI
NSF	Multivariate Sensing for Injection Molding	9/2010 - 8/2014	PI

LEADERSHIP AND SERVICE TO PROFESSIONAL SOCIETIES

1) Member of Lead Expert Team for Digital Manufacturing Accelerator Study on *A Revolution in Digital Manufacturing: Integration of Manufacturing Machines, Robotics, and Artificial Intelligence with Blacksmith-like Forming Technologies*, The Minerals, Metals & Materials Society (TMS), sponsored by the Office of Naval Research (ONR), 2023 - 2024.

2) Member of the Committee on Options for a National Plan for Smart Manufacturing, and Chair of Workshop on State-of-the-Art of Smart Manufacturing, appointed by the *National Academies of Sciences, Engineering, and Medicine* (NASEM), 2022 – 2024.

3) Secretary of Board of Directors (BOD): *North American Manufacturing Research Institute*, Society of Manufacturing Engineers (NAMRI/SME), since June 2024.

4) Scientific Committee Chair: 2022 – 2024; Chair-Elect: 2020 – 2022, *NAMRI/SME*.

5) Chair: *CIRP Collaborative Working Group (CWG) on AI in Manufacturing*: 2021 – 2024.

6) International Scientific Committee Member: *18th Global Conference on Sustainable Manufacturing*, (GCSM) Berlin, Germany, October, 2022.

7) Advisory Committee Member: *International Symposium on Flexible Automation* (ISFA), Yokohama City, Japan, July, 2022.

8) International Scientific Committee Member: *10th CIRP International Conference on Digital Enterprise Technology (DET),* Budapest, Hungary, October, 2021.

9) International Scientific Committee Member: *31st CIRP Design Conference,* University of Twente, Enschede, The Netherlands, May, 2021.

10) International Scientific Committee Member: *54th CIRP Conference on Manufacturing Systems* (CMS)*, Athens, Greece, May, 2021.

11) Scientific Committee Chair-Elect: *North American Manufacturing Research Institute* (NAMRI), and Member of Board of Directors, 2020 - 2022.

12) International Program Committee Member: *10th CIRP Sponsored International Conference on Digital Enterprise Technology* (DET 2020), Budapest, Hungary, October, 2020.

13) Conference Co-Chair: *53rd CIRP Conference on Manufacturing Systems* (CMS)*, Chicago, July, 2020.

14) Advisory Committee Member: *International Symposium on Flexible Automation* (ISFA), Chicago, IL, July, 2020.

15) Track Chair: *Smart Manufacturing and Cyber Physical Systems*, *North American Manufacturing Research Institute* (NAMRI/SME), 2018 - 2020.

16) Conference Chair: *8th CIRP International Conference on Through-Life Engineering Services* (TESConf), Cleveland, OH, October, 2019.

17) International Scientific Committee Member: *17th Global Conference on Sustainable Manufacturing,* Shanghai, China, October, 2019.

18) Technical Advisory Board Member: *Digital Manufacturing and Design Innovation Institute* (DMDII), 2015 – 2018.

19) International Scientific Committee Member: *52nd CIRP Conference on Manufacturing Systems* (CMS)*, Ljubljana, Slovenia, June, 2019.

20) International Scientific Committee Member: *16th Global Conference on Sustainable Manufacturing,* Lexington, KY, October, 2018.

21) Advisory Committee Member: *International Symposium on Flexible Automation* (ISFA), Kanazawa, Japan, July, 2018.

22) International Scientific Committee Member: *16th CIRP Global Conference on Sustainable Manufacturing*, Lexington, KY, October, 2018.

23) Track Co-Chair: *Smart Manufacturing and Cyber Physical Systems*, *North American Manufacturing Research Institute* (NAMRI/SME), for NAMRC, 2016 – 2018.

24) International Scientific Committee Member: *51st CIRP Conference on Manufacturing Systems,* Stockholm, Sweden, May, 2018.

25) Executive Committee Member: ASME Mechanical Engineering Department Heads/Chairs, April, 2017 – April 2018

26) International Scientific Committee Member: *12th International Conference on Technology of Plasticity*, Cambridge, UK, September, 2017.

27) Scientific Committee Member: *1st CIRP Conference on Composite Materials Parts Manufacturing,* Karlsruhe, Germany, June, 2017.

28) Conference Chair: *International Symposium on Flexible Automation* (ISFA), Cleveland, OH, August, 2016.

29) Conference Co-Chair: *The 29th International Congress on Condition Monitoring and Diagnostic Engineering Management* (COMADEM), Xi'an, China, August, 2016.

30) Scientific Committee Member: *23rd CIRP Conference on Life Cycle Engineering*, Berlin, Germany, May, 2016.

31) Scientific Committee Member: *CIRP 48th Conference on Manufacturing Systems* (CMS), Naples, Italy, June, 2015.

32) Conference Co-Chair: *International Symposium on Flexible Automation*, Kobe, Japan, July, 2014.

33) Conference Organizing Committee Member: *ASME Dynamic Systems and Control Conference*, Stanford University, October, 2013.

34) Scientific Committee Member: *46th CIRP Conference on Manufacturing Systems*, Setúbal, Portugal, May, 2013.

35) Chair: Technical Committee on Built-in-Test and Self-Test, *IEEE Instrumentation and Measurement Society*, 1999 – 2013.

36) NSF CAREER Proposal Writing Workshop, Co-Chair, Hartford, CT, April, 2011.

37) NSF CAREER Proposal Writing Workshop, faculty facilitator, St. Louis, MO, 2016; Boston, MA, 2015; Tampa, FL, 2013; Reno, NV, 2012; Atlanta, GA, 2010; Evanston, IL, 2008.

38) Chair: Sensors and Instrumentation Panel, *ASME Dynamic Systems and Control Division*, 2000 – 2003.

39) Vice Chair: Instrumentation and Component Panel, ASME Dynamic Systems and Control Division, 1997-1999.

40) Track Organizer/Program Committee Member: Sensors and Actuators, *International Symposium on Flexible Automation*, St. Louis, MO, June, 2012.

41) International Program Committee Member: *IEEE International Instrumentation and Measurement Technology Conference*, 2000 – present.

42) Symposium Organizer: Advances in Pervasive Sensing and Computing for Manufacturing Systems, *ASME International Manufacturing Science & Engineering Conference*, Corvallis, OR, June, 2011.

43) Workshop Co-Chair: *NSF CAREER Proposal Writing Workshop*, Hartford, CT, April, 2011.

44) Conference Co-Chair: *NSF CMMI Research and Innovation Conference*, Hawaii, June, 2009.

45) Conference Co-Chair: *SPIE International Symposium on Sensors and Smart Structures Technologies for Civil, Mechanical and Aerospace Systems*, San Diego, CA, 2005 and 2006.

46) International Program Committee Member: *CIRP International Conference on Manufacturing Systems*, Madison, WI, June, 2011.

47) Technical Program Committee Member: *SPIE International Symposium on Sensors and Smart Structures Technologies for Civil, Mechanical and Aerospace Systems*, San Diego, CA, 2007-present.

48) Scientific Committee Member: *North American Manufacturing Research Conference*, 2000 – 2005, and 2008 - present.

49) Focused Tracks Chair: *IEEE/ASME International Conference on Advanced Intelligent Mechatronics* (AIM), Montreal, Canada, July, 2010.

50) Topic Program Committee Member: *IEEE Sensors Conference*, Atlanta, GA, October, 2007.

51) Program Committee Member: *IEEE/ASME International Conference on Advanced Intelligent Mechatronics* (AIM), ETH Zürich, Switzerland, September, 2007.

52) Publication Committee Member: *8th International Symposium on Measurement Technology and Intelligent Instruments*, Sendai, Japan, September, 2007.

53) Technical Program Committee Member: *IEEE International Symposium on Computational Intelligence for Measurement Systems and Applications*, Lugano, Switzerland, July, 2003.

54) Technical Program Committee Member: *IEEE International Conference on Virtual Environments, Human-Computer Interfaces, and Measurement Systems*, and *IEEE International Conference on Computational Intelligence for Measurement Systems and Applications*, Boston, MA, July, 2004.

55) Scientific Committee Member, *International Conference on Flexible Automation and Intelligent Manufacturing*, Toronto, Canada, July, 2004 and Bilbao, Spain, July, 2005.

56) International Program Committee Member: *International Conference on Mechatronics*, Loughborough, UK, Sept. 2003, and Aachen, Germany, Sept. 2005.

57) Scientific Committee Member: *6th International Symposium on Measurement Technology and Intelligent Instruments*, Hong Kong, November, 2003.

58) Conference Session Chairman, *ASME International Mechanical Engineering Conference and Exhibition*, Dynamic Systems and Control Division, 1997 – 2003.

59) Technical Review Committee Member: *International Conference on Signal Processing Applications and Technology* (ICSPAT), Orlando, FL, November, 1999.

60) Program Committee Member: *SPIE International Symposium on Micromachining and Microfabrication*, The International Society of Optical Engineering, Austin, TX, September 1997.

61) Conference Session Chairman, *17th Southeastern Conference on Theoretical and Applied Mechanics*, Little Rock, AK, April, 1994.

COURSES TAUGHT (at various institutions)

1) Undergraduate Courses:
- Dynamics
- Vibrations
- Senior Projects
- Senior Design Project
- Linear System Theory
- Mechanical Engineering Instrumentation and Measurement
- Engineering Communication and Design for Manufacturing

2) Graduate Courses:
- Theory and Design of Automatic Control
- Advanced Mechanical Vibrations
- Advanced Dynamics
- Mechatronic Systems Design