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 in-situ monitoring of manufacturing processes (e.g., plastic injection molding, sheet metal stamping, microrolling, etc.) and prognosis of product quality and system performance (e.g., aircraft engines and building HVAC). He has served as a PI/Co-PI of more than 70 projects funded by funding agencies and industry companies, and is the Thrust Lead for *Control, Intelligence, and Autonomy* of the newly established NSF Engineering Research Center (ERC) for *Hybrid Autonomous Manufacturing, Moving from Evolution to Revolution* (HAMMER). He has co-authored 3 books, more than 400 technical papers (including over 190 journal articles), 13 awarded patents, and given more than 110 invited talks.

Prof. Gao is a leader in the national and international manufacturing research community. He is the Chair of the *Workshop on State-of-the-Art of Smart Manufacturing*, which is one of the three workshops organized by the National Academies of Sciences, Engineering, and Medicine (NASEM) with the mission to develop Options for a National Plan for Smart Manufacturing. He is also the Chair of the CIRP *Collaborative Working Group on Artificial Intelligence in Manufacturing* (CWG-AI), and Chair of the *Scientific Committee of the North American Manufacturing Research Institution* (NAMRI) of SME. He was a Guest Editor for the *Special Issue of AI in Advanced Manufacturing Processes* of the Journal of Materials Processing Technology (JMPT), *Focused Section on AI-based Monitoring in Smart Manufacturing* of the IEEE/ASME Transactions on Mechatronics, Lead Guest Editor for the *Special Issue on Data Science-Enhanced Manufacturing* of the ASME Journal of Manufacturing Science and Engineering, etc. Presently he is a Senior Editor for the IEEE/ASME *Transactions on Mechatronics*.

Prof. Gao's research contributions have been broadly recognized by his peers. He is a Fellow of the *International Academy for Production Engineering* (CIRP), *Society of Manufacturing Engineers* (SME), *American Society of Mechanical Engineers* (ASME), *Institute of Electrical and Electronic Engineers* (IEEE), and a Distinguished Fellow of the *International Institute of Acoustics and Vibration* (IIAV). He is a recipient of the 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*, NSF *CAREER* award, and multiple *Best Paper* awards. He is an elected member of the Connecticut Academy of Science and Engineering and was a Distinguished Lecturer of the IEEE IM Society and IEEE Electron Devices Society.

As Department Chair, Prof. Gao has demonstrated leadership in promoting research, education, diversity, equity and inclusion to advance a department of more than 20 faculty, 400 undergraduate and 120 graduate students. He provided a strategic vision and built a collegial, collaborative, diverse, 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 2015, both the research expenditure and the annual journal publications of the department have more than doubled. More than half of the faculty, including women and underrepresented minority (URM), have been hired under his leadership. He has also effectively mentored junior faculty colleagues to successfully launch their careers, as evidenced in their receiving major awards such as NSF CAREER, ONR YIP, and AFOSR YIP, every year since 2016. He led the department in successfully completing the ABET accreditation review in 2018.

Prof. Gao has served on the Technical Advisory Board of the former Digital Manufacturing and Design Innovation Institute (DMDII, name changed to MxD), ASME Mechanical Engineering Department Heads Executive Committee (MEDHEC), and Board of Trustees of the Ohio Aerospace Institute (OAI). He is a member of the NAMRI/SME Board of Directors and the Chair of the SME Journals Committee.

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) Elected Distinguished Fellow, The International Institute of Acoustics and Vibration (IIAV), 2022.
2) 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.
3) Best Paper Award (*for the paper titled "Deep Learning for Smart Manufacturing: Methods and Applications*"), Journal of Manufacturing Systems, 2021.
4) 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.
5) Outstanding Paper Award (*for the paper titled "Transferable Two-stream Convolutional Neural Network for Human Action Recognition"*), 48th SME North American Manufacturing Research Conference (SME/NAMRC), Cincinnati, OH, 2020.
6) Named one of The 20 Most Influential Professors in Smart Manufacturing, Society of Manufacturing Engineers (SME), 2020.
7) 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.
8) Eli Whitney Productivity Award (*for distinguished accomplishments in improving capability within the broad concept of orderly production*), Society of Manufacturing Engineers, 2019.
9) 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.

10) 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.
11) Hideo Hanafusa Outstanding Investigator Award (*for significant contributions to flexible automation through innovative sensing and advanced analytic methods*), International Symposium on Flexible Automation, 2018.
12) 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.
13) 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 (SME/NAMRC), Los Angeles, CA, 2017.
14) Elected Fellow, International Academy for Production Engineering (CIRP), 2016.
15) 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.
16) Elected Fellow, Society of Manufacturing Engineers (SME), 2014.
17) Outstanding Presentation Award (*for the paper titled "Noninterference Identification of Rotating Blade Vibration"*), 12th International Conference on Vibration and Motion Control, Hokkaido, Japan, 2014.
18) 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.
19) Distinguished Lecturer, IEEE Instrumentation and Measurement Society, 2014-2017.
20) 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.
21) IEEE Technical Award (*for significantly advancing the state-of-the-art in electrical capacitance tomography instrument design*), IEEE Instrumentation and Measurement Society, 2013.
22) Distinguished Lecturer, IEEE Electron Devices Society, 2008-2013.
23) Featured article, "Era of Discovery", *International Innovation*, North American issue, September, 2013.
24) Best Paper in Session Award (*for the paper titled "Pattern Classification Based on Sparse Representation"*), ASME Dynamic Systems and Control Conference, Fort Lauderdale, FL, October, 2012.
25) 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.
26) 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.
27) Outstanding Associate Editor Award, IEEE Transactions on Instrumentation and Measurement, 2012.
28) Research Excellence Award, Department of Mechanical Engineering, University of Connecticut, 2011.
29) Philips Young Investigator Award (PYIA), 2nd Prize, Faculty advisor, IEEE International Conference of the Engineering in Medicine and Biology Society, Boston, MA, August, 2011.
30) Best Paper Award Finalist (*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.

31) Best Student Paper Award Finalist (*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.
32) SME Outstanding Student Research Award (*Honorable Mention*), Faculty advisor, North American Manufacturing Research Conference, Kingston, Canada, May, 2010.
33) ASME Manufacturing Student Design Competition Award (*Finalist*), Faculty advisor, International Manufacturing Science and Engineering Conference (MSEC), Erie, PA, June, 2010.
34) Elected Member, Connecticut Academy of Science and Engineering (CASE), 2010.
35) Pratt & Whitney Chair Professorship, University of Connecticut, with successful evaluation of the first five-year term and renewal for the second term, August 2008 – January 2015.
36) Elected Fellow, Institute of Electrical and Electronic Engineers (IEEE), 2008.
37) Outstanding Senior Engineering Faculty Award, University of Massachusetts Amherst, 2007.
38) Award for Outstanding Accomplishment in Research and Creative Activity (Finalist), University of Massachusetts Amherst, 2007.
39) Spirit Award, Sensor-Integrated Long Cane, faculty advisor and PI, The Harold Grinspoon Charitable Foundation Entrepreneurship Initiatives, 2006.
40) Elected Fellow, American Society of Mechanical Engineers (ASME), 2006.
41) Certificate of Appreciation, World Tribology Congress Oversight Committee, 2005.
42) Certificate of Appreciation, ASME Dynamic Systems and Control Division, 2004.
43) Distinguished Teaching Award nominee, University of Massachusetts Amherst, 2004.
44) Senior Research Fellow and Guest Researcher, National Institute of Standards and Technology (NIST), Gaithersburg, MD, April - August, 2003.
45) Featured presentation, *Engineering Times*, published by the National Society of Professional Engineers, on sensors research, July 2003.
46) Featured presentations, various newspaper articles and radio station interviews in Massachusetts on sensor-related research, 2003.
47) Appointed Adjunct Professor, Northeastern University, China, 2002-2007.
48) Senior Research Fellow and Guest Researcher, *National Institute of Standards and Technology*, Gaithersburg, MD, June, 2001.
49) Barbara H. and Joseph I. Goldstein Outstanding Junior Engineering Faculty Award, University of Massachusetts, 1999.
50) Distinguished Teaching Award nominee, University of Massachusetts Amherst, 1998.
51) Featured presentation, "*AMT News*", *American Association for Manufacturing Technology*, for interdisciplinary research in sensors and integrated machine condition monitoring, May, 1998.
52) Inaugural Best Student Paper Award (for the paper titled "Smart Bearing Utilizing Embedded Sensors: Design Consideration"), *SPIE's International Symposium on Smart Structures and Materials*, 1997.
53) Nominated for the Annual Symposium on Frontiers of Engineering, organized by the *National Academy of Engineering*, 1997.
54) Early CAREER Award, National Science Foundation, 1996.
55) Faculty Summer Research Award, *LA Tech University*, 1994.
56) DAAD Fellowship, German Academic Exchange Agency, 1983-1985.

EDITORIAL POSITIONS

1) **Senior Editor:**
   - IEEE/ASME Transactions on Mechatronics, since January 2020.
2) **Guest Editor**:
   - 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 (Eds.), "Condition Monitoring and Control for Intelligent Manufacturing", *Springer*, UK, ISBN 1-84628-268-3, 2006.
3) 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.
4) 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), ISBN978-3-030-69177-6, *Springer*, 2021.

5) 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, August, 2019.
6) 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), pp. 447-462, DOI: 10.1016/B978-0-12-409548-9.10217-9, 2017.
7) 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*, 2015.
8) 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.
9) 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.
10) 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.
11) 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.
12) 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) 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.
2) 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.
3) 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.
4) 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.
5) 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.
6) 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.
7) 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.
8) 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.
9) 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.
10) 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.
11) 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.
12) 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.
13) 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.
14) 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.
15) 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.
16) 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.
17) 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.

18) 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.
19) 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.
20) 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.
21) P. Wang, R. Gao, and W. Woyczynski, "Lévy process-based stochastic modeling for machine performance degradation prognosis", *IEEE Transactions on Industrial Electron*ics, Vol. 68, No. 12, pp. 12760-12770, December, 2020.
22) 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.
23) 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.
24) 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.
25) 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.
26) 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.
27) 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.
28) 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.
29) 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.
30) 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.
31) 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.
32) 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.
33) 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.
34) 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.
35) 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.

36) 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.
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217) 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.
218) 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.
219) 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.
220) 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.
221) 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.
222) 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.
223) 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.
224) 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.
225) 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.
226) 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.
227) B. Rao and R. Gao, "Temperature modeling for orthogonal diamond machining", ASPE 1995 Winter Annual Meeting, pp. 223-226, Austin, TX, October, 1995.
228) 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.

229) 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.

230) 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.

231) 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.

232) 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.

233) 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.

234) 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.

235) 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.

236) 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.

237) 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.

238) 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.

239) 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.

240) 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.

241) 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 IN 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 Magazin*e, 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) Keynote, "Data Science for Intelligent Maintenance", First International Conference on Equipment Intelligent Operation and Maintenance (ICEIOM2023), Hefei, China, September, 2023.
2) Invited webinar, "Digital Twins for Cyber Physical Systems", Vels Institute of Science, Technology and Advanced Studies, Chennai, India, March, 2023.
3) Keynote, "An AI Pathway Towards Sustainable Manufacturing", United Nations Expert Talk Series on "AI for Good", December, 2022.
4) Plenary, "Model-Based and Data-Driven Methods for Cyber Physical Systems Condition Monitor-

ing", Annual Conference of the Society for Machine Failure Prevention Technology (MFPT), Savannah, GA, August, 2022.

5) 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.
6) 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.
7) 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.
8) Distinguished Research Seminar, "Physics-Based Sensing and Machine Learning for Smart Manufacturing", The Hong Kong Polytechnic University, February, 2022
9) Plenary, "Digital Twin for Cyber Physical Systems Modeling and Operation Optimization", Digital Twin Global Forum (DTGF), January, 2022.
10) 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.
11) Invited seminar, "Multi-Physics Sensing and Machine Learning for Smart Manufacturing", Department of Aerospace and Mechanical Engineering", University of Notre Dame, November, 2021.
12) Plenary, "Data-Augmented Intelligent Sensing", 3rd Symposium of the International Academy of Engineering and Technology (AET), August, 2021.
13) Invited seminar, "Digital Twin for Cyber Physical Systems Modeling and Operation Optimization", NASA Glenn Research Center, Cleveland, OH, July, 2021.
14) 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.
15) Invited seminar, "Process-Embedded Sensing and Machine Learning for Smart Manufacturing", Department of Mechanical Engineering, Tufts University, April, 2021.
16) Invited seminar, "Process-Embedded Sensing and Machine Learning for Smart Manufacturing", Department of Integrated Systems Engineering, Ohio State University, March, 2021.
17) Invited seminar, "Process-Embedded Sensing and Machine Learning for Smart Manufacturing", Department of Mechanical Engineering, University of Texas at San Antonio, November, 2020.
18) 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.
19) 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.
20) Invited seminar, "Machine Learning for Smart Manufacturing", School of Mechanical and Power Engineering, Shanghai Jiaotong University, Shanghai, China, October, 2019.
21) 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.
22) 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.
23) 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.
24) Invited talk, "Process-embedded Sensing and Machine Learning for Smart Manufacturing", Institute

for Machine Tools and Production Engineering, RWTH Aachen University, Germany, July, 2019.

25) 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.
26) Invited Seminar, "Machine Learning for Smart Manufacturing", Department of Mechanical Engineering, Tsinghua University, April, 2019.
27) Invited Seminar, "Machine Learning for Smart Manufacturing", Department of Automation and Control, Beihang University, April, 2019.
28) Invited seminar, "Multi-physics Sensing and Data Analytics for Smart Manufacturing", Department of Mechanical Engineering, Southern University of Science and Technology, April, 2019.
29) Invited seminar, "Machine Learning for Smart Manufacturing", School of Mechanical Engineering, Xi'an Jiaotong University, April, 2019.
30) Invited seminar, "Multivariate Sensing for Improved Observability in Manufacturing", Mechanical Engineering, University of Michigan, Ann Arbor, MI, March, 2019.
31) Plenary, "Machine Learning for Enhanced Manufacturing", 48th International Conference on Computers and Industrial Engineering, Auckland, New Zealand, December, 2018.
32) 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.
33) Invited talk, "Stochastic Modeling for System Remaining Life Prognosis", Industry Forum, National Institute for Standards and Technology, Gaithersburg, MD, May, 2018.
34) Invited seminar, "Multivariate Sensing for Improved Observability in Manufacturing", Mechanical and Aerospace Engineering, University of Colorado, Colorado Springs, CO, March, 2018.
35) Keynote speech, "Stochastic Modeling for Predictive Maintenance", 6th International Conference on Through-life Engineering Services, Bremen, Germany, November, 2017.
36) Invited talk, "Deep Learning-based Data Analytics for Pattern Recognition", Sherwin Williams, Cleveland, November, 2017.
37) Invited seminar, "Machine Learning for Intelligent Manufacturing", Distinguished Lecture of the IEEE Instrumentation and Measurement Society, Xi'an Jiaotong University, China, October, 2017.
38) Invited seminar, "Multi-Physics Sensing for Intelligent Manufacturing", *Southeast University*, Nanjing, China, October, 2017.
39) Invited seminar, "Multi-Physics Sensing for Intelligent Manufacturing", *China University of Petroleum*, Beijing, China, October, 2017.
40) 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.
41) Invited talk, "Advanced Sensing for Intelligent Manufacturing", 2017 IEEE Fall Technical Workshop, Minneapolis, MN, September, 2017.
42) Invited talk, "Data Science for Enhanced System Performance Prediction", Air Force Research Lab, Dayton, OH, September, 2017.
43) Invited seminar, "Probabilistic Modeling for System Remaining Life Prognosis", Gas Turbine Laboratory, Ohio State University, Columbus, OH, September, 2017.
44) Invited talk, "Machine Learning: Techniques and Applications", CIRP General Assembly, STC-F Meeting, Lugano, Switzerland, August, 2017.
45) Plenary, "Probabilistic Modeling for System Remaining Life Prognosis", 2nd International Workshop on Probabilistic Prognostics and Health Management of Energy Systems, Lubbock, TX, May, 2017.
46) 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.
47) Invited seminar, "Multiphysics Sensing and Data Analytics for Smart Manufacturing", Industrial

and Manufacturing Engineering, Pennsylvania State University, College Park, PA, February, 2017.

48) Keynote, "From Sensors to Sensor Informatics", 10th International Conference on Sensing Technology, Nanjing (ICST), Nanjing, China, November, 2016.
49) 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.
50) Keynote, "Through Life Analysis for Machine Tools: from Design to Remanufacture", 5th International Conference on Through-life Engineering Services, Cranfield, UK, October, 2016.
51) Invited talk, "Stochastic Modeling and Prediction for Improved Data Mining", NIST AMTech Sheet Metal Forming Roadmap, University of New Hampshire, Durham, NH, October, 2016.
52) Invited seminar, "Advanced Sensing and Data Analytics for Smart Manufacturing", Oregon State University, Corvallis, OR, April, 2016.
53) Invited seminar, Process-Embedded Sensing for Smart Manufacturing", Electrical Engineering and Computer Science, Case Western Reserve University, Cleveland, OH, March, 2016.
54) Invited seminar, "Advanced Sensing and Data Analytics for Smart Manufacturing", Northwestern University, Chicago, IL, October, 2015.
55) 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.
56) Keynote, Symposium on Advances in Modeling of Manufacturing Process Mechanisms", Society of Engineering Science Annual Technical Conference, Texas A&M University, October, 2015.
57) Keynote, "Cloud-Based Sensing and Instrumentation for Distributed Measurements", IEEE 2015 International Conference on Electronic Measurement & Instruments, Qingdao, China, July, 2015.
58) Invited seminar, "Advanced Sensing and Computational Intelligent for Smart Manufacturing", Mechanical and Aerospace Engineering, University of California, Los Angeles, CA, May, 2015.
59) Invited seminar, "Frontiers of Sensing and Computational Intelligent for Advanced Manufacturing", Mechanical Engineering, Tsinghua University, Beijing, China, July, 2014.
60) Invited seminar, "Advanced Sensing and Computational Intelligent for Smart Manufacturing", School of Instrument Science and Engineering, Beihang University, Beijing, China, July, 2014.
61) Invited seminar, "Advanced Sensing for Intelligent Manufacturing", School of Mechanical Engineering and Automation, Xi'An Jiaotong University, Xi'An, China, July, 2014.
62) Invited seminar, "Sensing and Signal Processing for Dynamic Systems Monitoring", Department of Mechanical Engineering, Beijing Jiaotong University, Beijing, China, July, 2014.
63) Keynote, "Advanced Mechatronics for Intelligent Manufacturing", International Conference on Mechatronics, Karlstad, Sweden, June, 2014.
64) Invited seminar, "Advanced Sensing and Signal Processing for Intelligent Manufacturing", Royal KTH Institute of Technology, Stockholm, Sweden, June, 2014.
65) Invited seminar, "Intelligent Sensing for Improved Observability in Systems Monitoring", School of Engineering, Case Western Reserve University, May, 2014.
66) Invited seminar, "Multivariate Sensing and Computational Intelligence for Advanced Manufacturing", International Center for Automotive Research, Clemson University, November, 2013.
67) Invited talk, "Advanced Sensing and Instrumentation for Manufacturing", IEEE International Instrumentation and Measurement Technology Conference, Minneapolis, MN, May, 2013.
68) Keynote, "Sensing, Control, and Intelligent Methods for Manufacturing", Third International Symposium on Fundamental Research of Manufacturing Science, Tsinghua University, Beijing, China, July, 2013.
69) Invited seminar, "Recent Advancement in Defect Diagnosis for Rotary Machines", Beijing University of Chemical Technology, Beijing, China, August, 2013.
70) Keynote, "Multivariate Sensing and Intelligent Computation for Process Monitoring and Quality Control", American Society of Quality, Hartford, CT, October, 2012.
71) Keynote, "Advanced Instrumentation and Analytics for Energy Smart Buildings", 4th International

Symposium on Test Automation and Instrumentation, Dandong, China, August, 2012.

72) Invited talk, International Workshop on Smart and Resilient Transportation Infrastructure, Virginia Institute of Technology, Blacksburg, VI, April, 2012.
73) 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.
74) Invited seminar, "Sensing and Sensor Networks for Process Monitoring", Beijing University of Chemical Technology, Beijing, China, August, 2012.
75) Invited talk, "Advanced Sensing for Improved Observability in Process Control", United Technologies Research Center, East Hartford, CT, May, 2012.
76) 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.
77) Keynote, "Recent Advancement in Measurement Science for Improved Process Observability", IEEE 2011 International Conference on Electronic Measurement & Instruments, Chengdu, China, August, 2011.
78) 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.
79) Distinguished Lecture, "Mechatronic Design and Modeling for Improved Observability of Dynamic Processes", IEEE Society for Electron Devices, Nanjing Chapter, China, July, 2010.
80) Invited seminar, "Multivariate Sensing and Signal Processing for Process Monitoring and Diagnostics", Department of Precision Engineering and Mechanology, Tsinghua University, Beijing, China, July, 2010.
81) Invited talk, "Multivariate, Wireless Sensing and Signal Processing for Dynamic Systems Monitoring and Diagnostics", Alstom Corporation, Windsor, CT, June, 2010.
82) Fellows Lecture, "Multivariate Sensing and Signal Processing for Dynamic Systems Monitoring and Diagnostics", United Technologies Corporation, East Hartford, CT, May, 2010.
83) 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.
84) Invited talk, "Embedded Sensing and Signal Processing for Machine Health Monitoring and Diagnosis", NASA Stennis Space Center, March, 2009.
85) Invited talk, "Embedded Sensing and Reconfigurable Sensor Networks for System Condition Monitoring", Chinese Academy of Sciences, Institute for Microelectronics, Beijing, China, July, 2008.
86) Invited seminar, "Integrated Sensing for Health Monitoring and Diagnosis in Mechanical Systems", Tsinghua University, Department of Precision Engineering and Mechanology, Beijing, China, December, 2007.
87) 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.
88) Invited seminar, "Integrated Sensing for Dynamic System Health Monitoring", University of Connecticut, Department of Mechanical Engineering, November, 2006.
89) Invited talk, "Energy Efficient Wireless Sensor Network for Dynamic System Monitoring", SPIE Symposium on NSF Sponsored Research: Sensors in Manufacturing, Boston, MA, October, 2005.
90) Invited talk, "Energy-Efficient Sensor Networks", INFORMS 2005 Annual Conference, Distributed Sensing Mini-Track, San Francisco, CA, November, 2005.
91) Invited talk, Industrial Engineering Research Conference, session on Optimal Design of Sensor Networks, Atlanta, GA, May, 2005.
92) Invited talk, 5th International Workshop on Advanced Manufacturing Technologies (AMT 2005), National Research Council of Canada, Ontario, Canada, May, 2005.

93) 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.
94) Invited talk, "Sensors and Sensor Networks for Health Monitoring in Machine Systems", National Research Council of Canada, Ontario, Canada, July, 2004.
95) 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.
96) Invited talk, "Design of a Smart Spindle for Smart Machine Tools", Manufacturing Metrology Division, National Institute of Standards and Technology, Gaithersburg, MD, July, 2003.
97) Invited seminar, "Integrated Sensing and Signal Processing for Machine Health Diagnosis", Northeastern University, Department of Mechanical, Industrial, and Manufacturing Engineering, Boston, MA, December, 2003.
98) 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.
99) 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.
100) 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.
101) Invited talk, "Research in Biomechanics and How Engineering Modeling Helps Clinical Research, New England Orthopedic Study Group, September, 2001.
102) Invited seminar, "Mechatronics for Intelligent Manufacturing", Drexel University, Mechanical Engineering and Mechanics, January, 2001.
103) Invited seminar, "Mechatronics for Intelligent Manufacturing and Assistive Technologies", Worcester Polytechnic Institute, MA, February, 2000.
104) Invited talk, "Intelligent Manufacturing", Summer Undergraduate Research Program, University of Massachusetts, July, 2000
105) Invited talk, "Research Themes for the Next Decade: Telecommunications, Nanotechnology, and Bioengineering", Dean's Advisory Council, University of Massachusetts, April 28, 2000.
106) Invited talk, "Assistive Technologies", CAREER Day, Women in Engineering Program, University of Massachusetts, October, 1999.
107) Invited talk, "Mechatronics in Manufacturing", Minority Engineering Student Program, University of Massachusetts, November, 1999.
108) Keynote, "Sensor-embedded Bearing for On-line Machine Condition Monitoring", SKF Corporation 1998 Global Users Conference, Las Vegas, NV, April, 1998.
109) Invited talk, "Design of Smart Electromechanical Systems for Manufacturing Process Monitoring", Kollmorgen Corporation, Northampton, MA, April, 1998.
110) 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.
111) 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.
112) 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.
113) 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.
114) Invited Talk, "Sensor Integrated Bearing", SKF Corporation, San Diego, CA, June, 1998.

115) Invited speaker/participant in NSF Workshops:
   (1) US-Japan Workshop on Human Centered Data for Resilience, October, 2022.
   (2) US-Italy Collaborative Research Workshop, Washington D.C., November, 2017.
   (3) Workshop on Low-Latency Wireless Networks, Washington D.C., November, 2016.
   (4) Mechatronics Education Innovation Workshop, New York, November, 2016.
   (5) US-South Korea Workshop on Future Direction of Research, Reno, NV, August, 2014
   (6) Future Research Needs in Advanced Manufacturing from Industrial Perspective, Arlington, VA, August, 2013
   (7) Frontiers of Additive Manufacturing Research and Education, Arlington, VA, July, 2013
   (8) US-Korea Workshop on Advanced Manufacturing, South Korea, May, 2013
   (9) Proposal Writing Workshop, University of Nebraska-Lincoln, NE, September, 2010.
   (10) Sensing and Prognostics for Scalability in Nanomanufacturing, Northeastern University, Boston, MA, November, 2009.
   (11) Cyber-Physical Systems Summit, St. Louis, MO, April, 2008
   (12) Advanced Intelligent Sensor Technologies for Safe and Secure Societies and Better Quality of Life, Tokyo, Japan, July, 2007
   (13) New Frontiers of Dynamic Systems, Arlington, VA, March, 2007.
   (14) Cyber Physical Systems, Austin, TX, October, 2006.
   (15) Engineered Systems Enabled by Cyber-Infrastructure, St. Louis, MO, July, 2006.
   (16) Science and Technologies for Manufacturing Machines and Processes, University of Nebraska, Lincoln, July, 2005.
   (17) Critical Review and Assessment of International Research and Development in Manufacturing Sensing and Control, University of Wisconsin-Madison, June, 2003.
   (18) Sensors Workshop, University of Maine, November, 2003.
   (19) NSF Foundation-wide CAREER Awardees P.I. Meeting on the Integration of Engineering Research and Education, 1999.
   (20) CAREER Awardees Workshop on the Integration of Research and Education, Division of Mechanical and Civil Systems, 1998.

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

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

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

RECENT SPONSORED PROJECTS

(Total grants of approximately $28 M has been received as PI/Co-PI/Senior Personnel at affiliated institutions since 1994, with Gao's funding totaling over $10M)

Funding Agency	Project	Duration	Role
NSF	ERC: Hybrid Autonomous Manufacturing, Moving from Evolution to Revolution (HAMMER)	9/2022 – 8/2027	Thrust Lead
NSF	SCC-IRG: A Manufacturing Approach to Advancing Northeast Ohio	11/2021 – 10/2024	PI
NSF	Energy-based Prognosis for Machining Surface Integrity through ML	8/2021 – 7/2024	PI
DOE	Industry Assessment Center for Sustainable Production	10/2019 - 9/2022	Co-PI
DOE	Materials Data Science for Stockpile Stewardship Center of Excellence	10/2022- 9/2027	Senior Person
NSF	INTERN: Human Robot Collaboration for Smart Factory	9/2020 – 8/2023	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
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	1/2015 - 12/2015	PI
Pratt & Whitney	Advanced Signal Processing for Non-Intrusive Stress Measurement	1/2015 - 12/2015	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) Chair of Workshop on State-of-the-Art of Smart Manufacturing and member of Committee on Options for a National Plan for Smart Manufacturing, appointed by the *National Academies of Sciences, Engineering, and Medicine* (NASEM), 2022 – 2024.
2) Scientific Committee Chair: *North American Manufacturing Research Institute* (NAMRI) and Member, *Board of Directors*, 2022 - 2024.
3) Chair: *CIRP Collaborative Working Group (CWG) on AI in Manufacturing*: 2021 – 2024.
4) International Scientific Committee Member: *18th Global Conference on Sustainable Manufacturing*, (GCSM) Berlin, Germany, October, 2022.
5) Advisory Committee Member: *International Symposium on Flexible Automation* (ISFA), Yokohama City, Japan, July, 2022.
6) International Scientific Committee Member: *10th CIRP International Conference on Digital Enterprise Technology (DET),* Budapest, Hungary, October, 2021.
7) International Scientific Committee Member: *31st CIRP Design Conference,* University of Twente, Enschede, The Netherlands, May, 2021.
8) International Scientific Committee Member: *54th CIRP Conference on Manufacturing Systems* (CMS), Athens, Greece, May, 2021.
9) Scientific Committee Chair-Elect: *North American Manufacturing Research Institute* (NAMRI), and Member of Board of Directors, 2020 - 2022.
10) International Program Committee Member: *10th CIRP Sponsored International Conference on Digital Enterprise Technology* (DET 2020), Budapest, Hungary, October, 2020.
11) Conference Co-Chair: *53rd CIRP Conference on Manufacturing Systems* (CMS), Chicago, IL, July, 2020.
12) Advisory Committee Member: *International Symposium on Flexible Automation* (ISFA), Chicago, IL, July, 2020.
13) Track Chair: *Smart Manufacturing and Cyber Physical Systems*, *North American Manufacturing Research Institute* (NAMRI/SME), 2018 - 2020.
14) Conference Chair: *8th CIRP International Conference on Through-Life Engineering Services* (TESConf), Cleveland, OH, October, 2019.

15) International Scientific Committee Member: *17th Global Conference on Sustainable Manufacturing,* Shanghai, China, October, 2019.
16) Technical Advisory Board Member: *Digital Manufacturing and Design Innovation Institute* (DMDII), 2015 – 2018.
17) International Scientific Committee Member: *52nd CIRP Conference on Manufacturing Systems* (CMS)*,* Ljubljana, Slovenia, June, 2019.
18) International Scientific Committee Member: *16th Global Conference on Sustainable Manufacturing,* Lexington, KY, October, 2018.
19) Advisory Committee Member: *International Symposium on Flexible Automation* (ISFA), Kanazawa, Japan, July, 2018.
20) International Scientific Committee Member: *16th CIRP Global Conference on Sustainable Manufacturing*, Lexington, KY, October, 2018.
21) Track Co-Chair: *Smart Manufacturing and Cyber Physical Systems*, *North American Manufacturing Research Institute* (NAMRI/SME), for NAMRC, 2016 – 2018.
22) International Scientific Committee Member: *51st CIRP Conference on Manufacturing Systems,* Stockholm, Sweden, May, 2018.
23) Executive Committee Member: ASME Mechanical Engineering Department Heads/Chairs, April, 2017 – April 2018
24) International Scientific Committee Member: *12th International Conference on Technology of Plasticity*, Cambridge, UK, September, 2017.
25) Scientific Committee Member: *1st CIRP Conference on Composite Materials Parts Manufacturing,* Karlsruhe, Germany, June, 2017.
26) Conference Chair: *International Symposium on Flexible Automation* (ISFA), Cleveland, OH, August, 2016.
27) Conference Co-Chair: *The 29th International Congress on Condition Monitoring and Diagnostic Engineering Management* (COMADEM), Xi'an, China, August, 2016.
28) Scientific Committee Member: *23rd CIRP Conference on Life Cycle Engineering*, Berlin, Germany, May, 2016.
29) Scientific Committee Member: *CIRP 48th Conference on Manufacturing Systems*, Naples, Italy, June, 2015.
30) Conference Co-Chair: *International Symposium on Flexible Automation*, Kobe, Japan, July, 2014.
31) Conference Organizing Committee Member: *ASME Dynamic Systems and Control Conference*, Stanford University, October, 2013.
32) Scientific Committee Member: *46th CIRP Conference on Manufacturing Systems*, Setúbal, Portugal, May, 2013.
33) Chair: Technical Committee on Built-in-Test and Self-Test, *IEEE Instrumentation and Measurement Society*, 1999 – 2013.
34) NSF CAREER Proposal Writing Workshop, Co-Chair, Hartford, CT, April, 2011.
35) NSF CAREER Proposal Writing Workshop, faculty facilitator, St. Louis, MO, 2016.
36) NSF CAREER Proposal Writing Workshop, faculty facilitator, Boston, MA, 2015.
37) NSF CAREER Proposal Writing Workshop, faculty facilitator, Tampa, FL, 2013.
38) NSF CAREER Proposal Writing Workshop, faculty facilitator, Reno, NV, 2012.
39) NSF CAREER Proposal Writing Workshop, faculty facilitator, Atlanta, GA, 2010.
40) NSF CAREER Proposal Writing Workshop, faculty facilitator, Evanston, IL, 2008.
41) Chair: Sensors and Instrumentation Panel, *ASME Dynamic Systems and Control Division*, 2000 – 2003.
42) Vice Chair: Instrumentation and Component Panel, ASME Dynamic Systems and Control Division, 1997-1999.
43) Track Organizer/Program Committee Member: Sensors and Actuators, *International Symposium on Flexible Automation*, St. Louis, MO, June, 2012.
44) International Program Committee Member: *IEEE International Instrumentation and Measurement Technology Conference*, 2000 – present.

45) Symposium Organizer: Advances in Pervasive Sensing and Computing for Manufacturing Systems, *ASME International Manufacturing Science & Engineering Conference*, Corvallis, OR, June, 2011.
46) Workshop Co-Chair: *NSF CAREER Proposal Writing Workshop*, Hartford, CT, April, 2011.
47) Conference Co-Chair: *NSF CMMI Research and Innovation Conference*, Hawaii, June, 2009.
48) Conference Co-Chair: *SPIE International Symposium on Sensors and Smart Structures Technologies for Civil, Mechanical and Aerospace Systems*, San Diego, CA, 2005 and 2006.
49) International Program Committee Member: *CIRP International Conference on Manufacturing Systems*, Madison, WI, June, 2011.
50) Technical Program Committee Member: *SPIE International Symposium on Sensors and Smart Structures Technologies for Civil, Mechanical and Aerospace Systems*, San Diego, CA, 2007-present.
51) Scientific Committee Member: *North American Manufacturing Research Conference*, 2000 – 2005, and 2008 - present.
52) Focused Tracks Chair: *IEEE/ASME International Conference on Advanced Intelligent Mechatronics* (AIM), Montreal, Canada, July, 2010.
53) Topic Program Committee Member: *IEEE Sensors Conference*, Atlanta, GA, October, 2007.
54) Program Committee Member: *IEEE/ASME International Conference on Advanced Intelligent Mechatronics* (AIM), ETH Zürich, Switzerland, September, 2007.
55) Publication Committee Member: *8th International Symposium on Measurement Technology and Intelligent Instruments*, Sendai, Japan, September, 2007.
56) Technical Program Committee Member: *IEEE International Symposium on Computational Intelligence for Measurement Systems and Applications*, Lugano, Switzerland, July, 2003.
57) 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.
58) Scientific Committee Member, *International Conference on Flexible Automation and Intelligent Manufacturing*, Toronto, Canada, July, 2004 and Bilbao, Spain, July, 2005.
59) International Program Committee Member: *International Conference on Mechatronics*, Loughborough, UK, Sept. 2003, and Aachen, Germany, Sept. 2005.
60) Scientific Committee Member: *6th International Symposium on Measurement Technology and Intelligent Instruments*, Hong Kong, November, 2003.
61) Conference Session Chairman, *ASME International Mechanical Engineering Conference and Exhibition*, Dynamic Systems and Control Division, 1997 – 2003.
62) Technical Review Committee Member: *International Conference on Signal Processing Applications and Technology* (ICSPAT), Orlando, FL, November, 1999.
63) Program Committee Member: *SPIE International Symposium on Micromachining and Microfabrication*, The International Society of Optical Engineering, Austin, TX, September 1997.
64) Conference Session Chairman, *17th Southeastern Conference on Theoretical and Applied Mechanics*, Little Rock, AK, April, 1994.

COURSES TAUGHT

1) Undergraduate Courses:
   - Dynamics;
   - Vibrations;
   - 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.