Diliang Chen

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EDUCATION

Case Western Reserve University   Cleveland, OH, USA
Ph.D., Computer Engineering   **Expected May 2020**
Dissertation: "Human centered sensing and computing: sensing system design and applications exploration for the foot motion information in a free-living environment"

Institute of Electronics of Chinese Academy of Sciences   Beijing, China
M.S., Microelectronics and Solid State Electronics   June 2015

Nanjing University of Posts and Telecommunications   Nanjing, Jiangsu, China
B.S., Electronic and Information Engineering   July 2011

WORK

Southern University of Science and Technology   Shenzhen, Guangdong, China
Research and Teaching Assistant   July 2015 - July 2016

PUBLICATIONS

Refereed journal publications

Chen D, Cai Y, Qian X, et al. Bring Gait Lab to Everyday Life: Gait Analysis in Terms of Activities of Daily Living [J]. **IEEE Internet of Things Journal**, 2019, (Accepted with Minor Revisions).

Chen D, Cao H, Chen H, et al. Smart Insole Based Indoor Localization System for Internet of Things Applications[J]. **IEEE Internet of Things Journal**, 2019, 6(4): 7253 - 7265.

Zhang X, Yang Z, Chen T, **Chen D**, et al. Cooperative Sensing and Wearable Computing for Sequential Hand Gesture Recognition[J]. **IEEE Sensors Journal**, 2019, 19(14): 5775 - 5783.

Chen D, Cai Y, Huang M C. Customizable pressure sensor array: Design and evaluation[J]. **IEEE Sensors Journal**, 2018, 18(15): 6337-6344.

Chen D, Cai Y, Cui J, et al. Risk factors identification and visualization for work-related musculoskeletal disorders with wearable and connected gait analytics system and kinect skeleton models[J]. **Smart Health**, 2018, 7: 60-77.

Chen D, Chen F, Murray A, et al. Respiratory modulation of oscillometric cuff pressure pulses and Korotkoff sounds during clinical blood pressure measurement in healthy adults[J]. **BioMedical Engineering OnLine**, 2016, 15(1): 53.

Sun F, Zhao Z, Fang Z, Du L, **Chen D**. Design and implementation of a high integrated noncontact ECG monitoring belt[J]. **Journal of Fiber Bioengineering and Informatics**, 2015, 8(1): 37-46.

Sun F, Fang Z, Zhao Z, Du L, Chu S, **Chen D**. Implementation and Real-Time and Reliability Evaluation of a WHMS Improved by LHRP and SMAM[J]. **International Journal of Distributed Sensor Networks**, 2015, 11(8): 282816.

Sun F, Zhao Z, Fang Z, Du L, Xu Z, **Chen D**. A review of attacks and security protocols for wireless sensor networks[J]. **Journal of Networks**, 2014, 9(5): 1103.

Refereed conference publications

Qian X, Cheng H, **Chen D**, et al. The Smart Insole: a pilot study of fall detection [C]//2019 14th EAI International Conference on Body Area Networks: Smart IoT and big data for intelligent health management (**BODYNETS**).

Cai Y, Jiang H, **Chen D**, et al. Online learning classifier based behavioral biometrie authentication[C]//2018 IEEE 15th International Conference on Wearable and Implantable Body Sensor Networks (**BSN**). IEEE, 2018: 62-65.

Cai Y, Chen J, **Chen D**, et al. Smart Prosthesis System: Continuous Automatic Prosthesis Fitting Adjustment and Real-time Stress Visualization[C]//2018 IEEE Biomedical Circuits and Systems Conference (**BioCAS**). IEEE, 2018: 1-4.

Chen D, Chen J, Jiang H, et al. Risk factors identification for work-related musculoskeletal disorders with wearable and connected gait analytics system[C]//2017 IEEE/ACM International Conference on Connected Health: Applications, Systems and Engineering Technologies (**CHASE**). IEEE, 2017: 330-339.

Chen D, Chen F, Murray A, et al. A method for extracting respiratory frequency during blood pressure measurement, from oscillometric cuff pressure pulses and Korotkoff sounds recorded during the measurement[C]//2016 38th Annual International Conference of the IEEE Engineering in Medicine and Biology Society (**EMBC**). IEEE, 2016: 4268-4271.

Chen D, Chen F, Murray A, et al. Phase difference between respiration signal and respiratory modulation signal from oscillometric cuff pressure pulses during blood pressure measurement[C]//2016 Computing in Cardiology Conference (**CinC**). IEEE, 2016: 1013-1016.

Wang L, Zhu S, **Chen D**, et al. Relative Contributions of Amplitude and Phase to the Intelligibility Advantage of Ideal Binary Masked Sentences[C]//**INTERSPEECH**. 2016: 136-139.

Chen D, Fang Z, Zhao Z, et al. GPMSwLF: Group physiological monitoring system with location function[C]//2013 IEEE International Conference on Information and Automation (**ICIA**). IEEE, 2013: 1056-1059.

PATENTS

Huang M, **Chen D**. Customizable pressure sensor array. 2019. US/International patent: WO2019173827A1.

Chen F, **Chen D**, Zheng D. A respiration rate measuring method and device. 2016. Chinese patent: CN105852863B.

Fang Z, **Chen D**, Wang Y, et al. A reflective photoelectric sensor and the design method for monitoring gingival blood. 2014. Chinese patent: CN104248421B.

Fang Z, **Chen D**, Zhao Z, et al. A gingival blood microcirculation monitoring system based on photoplethysmography. 2014. Chinese patent: CN104257351A.

RESEARCH EXPERIENCE

Case Western Reserve University   Cleveland, OH, USA
Ph.D. student; Advisor: Dr. Ming-Chun Huang   2016 - present

Research topic: Human centered sensing and computing, with a focus on the sensing system design and applications exploration for the foot motion information in a free-living environment.

• Proposed a customizable design method for pressure sensor array to make it trimmable to meet the requirement on different shapes and sizes with one design.

- Designed a Smart Insole for foot motion measurement in free-living environment. An Inertial Measurement Unit (IMU) and a customizable pressure sensor array with 96 sensors were embedded into the Smart Insole to quantify the foot motion.

- Proposed a gait analysis method – "gait analysis in terms of activities of daily living" to realize gait analysis in free-living environment.

- Proposed a drift reduction method based on human gait characteristics – "Know Velocity Update (KUPT) + Double Foot Position Calibration (DFPC)" for IMU based indoor localization system, which outperformed the popular used Zero Velocity Update (ZUPT) method.

- Proposed using plantar pressure to realize a comprehensive risk factors (including overexertion, awkward postures, and excessive repetitions) identification to prevent work-related musculoskeletal disorders (WMSDs).

Southern University of Science and Technology   Shenzhen, Guangdong, China
Research and Teaching Assistant; Advisor: Dr. Fei Chen   2015 - 2016

Research topic: Explore the modulation effect of respiration on Korotkoff sound and oscillometric cuff pressure pulses.

- Designed noise reduction and feature extraction algorithms for analyzing the amplitude and phase modulation effect of respiration on Korotkoff sound and oscillometric cuff pressure pulses.
- Designed algorithms to extract respiratory rate from Korotkoff sound and oscillometric cuff pressure pulses.

Institute of Electronics of Chinese Academy of Sciences   Beijing, China
M.S. student; Advisor: Dr. Zhan Zhao   2011 - 2015

Research topic: Explore using wearable systems to contribute healthcare applications.

- Designed a wearable system to monitor the rehabilitation process of transferred oral mucosal with the measured photoplethysmography (PPG) signal.

- Designed a wearable system to realize a continuous monitoring of physiological parameters such as electrocardiogram (ECG), PPG, heart rate, oxygen saturation (SpO2), and respiration rate.

TEACHING EXPERIENCE

Case Western Reserve University   Cleveland, OH, USA
Teaching Assistant, Computer Architecture   Spring 2018
Teaching Assistant, Very Large Scale Integration Systems   Fall 2017
Teaching Assistant, Digital Systems Design   Spring 2017

Southern University of Science and Technology   Shenzhen, Guangdong, China
Teaching Assistant, Signals and Systems   Spring 2016

CONFERENCE PRESENTATION

"Risk factors identification for work-related musculoskeletal disorders with wearable and connected gait analytics system", 2017 IEEE/ACM International Conference on Connected Health: Applications, Systems and Engineering Technologies (CHASE), Philadelphia, PA, USA, July 19, 2017.

SERVICE

Reviewer (Journals):

IEEE Internet of Things Journal

IEEE Access Journal

PLOS ONE

AWARDS

Think[box] Student Project Fund.	2017
NSF funded Student Travel Grant for the ACM/IEEE CHASE'17 conference.	2017