WEINAN WANG

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EDUCATION

Rutgers, The State University of New Jersey, *Ph.D. Candidate* *01/2021 – Present*
Electrical and Computer Engineering
G.P.A.: 4.0/4.0
Thesis Topic: Artificial Intelligence for Health Monitoring via Non-Invasive Sensors
Core courses: Supervised Machine Learning, Deep Learning, Machine Vision, Detection and Estimation Theory, Convex Optimization

Rutgers, The State University of New Jersey, *M.Sc.* *09/2018 – 01/2021*
Electrical and Computer Engineering
G.P.A.: 4.0/4.0
Thesis: Data-driven Methodologies for Cuff-less Blood Pressure Estimation
Core courses: Digital Signal and Filters, System Analysis, Data Structure and Algorithms, Software Engineering

University of Electronic Science and Technology of China, *B.Sc.* *09/2015 – 06/2018*
Mechanical Design and Automation
G.P.A.: 3.88/4.0
Core courses: Signals and Systems, Theoretical Mechanics, Mechanics of Materials, CAD/CAE Technology

EXPERIENCE

Research Assistant *09/2019 – Present*
Department of Electrical and Computer Engineering, Rutgers, The State University of New Jersey
Supervisor: Prof. Laleh Najafizadeh

- **End-to-end Deep Learning-Based Cuff-less Blood Pressure Estimation**
  - Developed novel automatic and fully data-driven blood pressure estimation methods requiring only photoplethysmogram (PPG) signal as input.
  - Developed methods to enable transfer learning of pre-trained deep convolutional networks for blood pressure estimation.
  - Developed methods for converting 1-D physiological signals into images.
  - Developed blood pressure estimation models via long-short-term-memory (LSTM) and various deep convolutional networks (CNN)

- **Pulse Wave Velocity Model-Based Cuff-less Blood Pressure Estimation**
  - Developed robust and physiology-supported blood pressure estimation methods requiring electrocardiogram (ECG) and photoplethysmogram (PPG) as input.
  - Developed and released GUI and API, named ***PulseLab,*** as the first comprehensive toolbox that enables users to optimize the blood-pressure estimation models.
    GitHub Page: https://github.com/pulselabteam/pulselab
  - Studied and utilized linear and non-linear regression, multiple linear regression, ridge regression, correlation analysis, Bland-Altman analysis, and signal quality index (SQI) assessment.

Teaching Assistant *09/2021 – 12/2021, Present*
Department of Electrical and Computer Engineering, Rutgers, The State University of New Jersey
Courses: Analog & Digital Electronics

PEER-REVIEWED JOURNAL & CONFERENCE PUBLICATIONS

- **W. Wang,** P. Mohseni, K. L. Kilgore and L. Najafizadeh, "PulseDB: a large, cleaned dataset for benchmarking cuff-less blood pressure estimation methods," under review.
- **W. Wang** and L. Najafizadeh, "Imaging physiological signals," to appear in 56th Asilomar Conference on Signals, Systems, and Computers, 2022.
- **W. Wang,** P. Mohseni, K. L. Kilgore and L. Najafizadeh, "Cuff-less blood pressure estimation from photoplethysmography via visibility graph and transfer learning," *IEEE Journal of Biomedical and Health Informatics*, vol. 26, no. 5, pp. 2075-2085, 2022. (featured article of the issue)
- **W. Wang,** F. Marefat, P. Mohseni, K. Kilgore and L. Najafizadeh, "The effects of filtering PPG signal on pulse arrival time-systolic blood pressure correlation," *44th Annual International Conference of the IEEE Engineering in Medicine and Biology Society (EMBC)*, 2022, pp. 674–677.
- **W. Wang,** C. A. Delianides, D. B. Green, P. Mohseni, K. L. Kilgore, and L. Najafizadeh, "Systolic blood pressure estimation via photoplethysmography features-an animal study," *Optical Tomography and Spectroscopy*, 2022, Optica Publishing Group, p. JM3A. 6.
- **W. Wang,** P. Mohseni, K. Kilgore, and L. Najafizadeh, "Cuff-less blood pressure estimation via small convolutional neural networks," *43rd Annual International Conference of the IEEE Engineering in Medicine & Biology Society (EMBC)*, 2021, pp. 1031-1034.
- **W. Wang,** P. Mohseni, K. Kilgore, and L. Najafizadeh, "PulseLab: An integrated and expandable toolbox for pulse wave velocity-based blood pressure estimation," *43rd Annual International Conference of the IEEE Engineering in Medicine & Biology Society (EMBC)*, 2021, pp. 5654-5657.
- **W. Wang,** L. Zhu, F. Marefat, P. Mohseni, K. Kilgore, and L. Najafizadeh, "Photoplethysmography-based blood pressure estimation using deep learning," *54th Asilomar Conference on Signals, Systems, and Computers*, 2020, pp. 945-949.

PROVISIONAL PATENT

- COMPUTER-BASED PLATFORMS AND SYSTEMS CONFIGURED FOR CUFF-LESS BLOOD PRESSURE ESTIMATION FROM PHOTOPLETHYSMOGRAPHY VIA VISIBILITY GRAPH AND TRANSFER LEARNING AND METHODS OF USE THEREOF

PROFESSIONAL SERVICES

- **Reviewer:**
  IEEE Biomedical Circuits and Systems Conference (BIOCAS) *2021 & 2022*
  Annual International Conference of the IEEE Engineering in Medicine & Biology Society (EMBC) *2022*

COURSE PROJECTS

- **Convex Optimization:** Experimental Comparisons of Convergence Robustness Between First Order Adaptive Learning Rate Optimizers *Spring 2021*
- **Introduction to Deep Learning:** Implementation of AdaBoost on LeNet-5 *Spring 2021*
- **Data Structure and Algorithms:** Solving Printed Circuit Board (PCB) Routing Problem Using Lee's and Hadlock's Maze Routing Algorithm *Spring 2019*

AWARDS

- Rutgers ECE Student Development Award *May 2022*
- People's Scholarship of China (Undergraduate, Annual, top 10%) *December 2017 & 2018*
- National Scholarship of China (Undergraduate, Annual, top 5%) *November 2016*

TECHNICAL SKILLS

- MATLAB® (script & GUI orientated)
- Python (PyTorch, TensorFlow, scikit-learn, NumPy)
- C++
- AutoCAD®