Wangzhi Dai

wzhdai@mit.edu | 857-999-1734

Looking for 2020 summer internship

Education

Massachusetts Institute of Technology Cambridge, MA

Ph.D. in Electrical Engineering and Computer Science *Expected 2022*

- Graduate Coursework: Machine Learning; Statistical Learning Theory; Algorithms for Inference; Nature Language Processing; Machine Learning for Healthcare

Peking University Beijing, China

Bachelor of Science in Electrical Engineering *2013 - 2017*

Research Experience

Computational Cardiovascular Research Group, MIT Cambridge, MA

Research Assistant *2017 - Present*

- **Generative Oversampling**: Developed a generative oversampling model based on contrastive Variational Autoencoder. Model leveraged shared information between majority and minority classes and significantly enhanced classification performance in extreme class-imbalance cases.
  - 1st author paper accepted at **IEEE ICDM 2019** (9% acceptance rate)
- **Missing Data Imputation**: Built and analyzed Restricted Boltzmann Machines to model high-dimensional, multimodal and mixed type data from a clinical registry. Performed missing data imputation with Markov Chain Monte Carlo sampling.
- **ECG Segmentation**: Implemented Hidden Markov Models to segment ECG signals and extracted features from the ST interval used in risk stratifications for patients with acute coronary syndrome.

MIT-IBM Watson AI Lab Cambridge, MA

Research Assistant *2018 - present*

- **Single Prediction Reliability**: Worked with an IBM research team and developed models to evaluate reliability of prediction on a single patient with heart disease.

Class Projects

- **Sentiment Analysis**: Developed a parse tree based model for sentiment analysis in negation contexts. Explicitly model linguistic constraints such as c-command and syntactic rules to recursively determine the sentiment of a sentence (In Natural Language Processing)
- **Bias Detection**: Discovered and analyzed bias of data in Electronic Health Record due to missing values. Developed a heterogenous imputation method and improved prediction tasks performance (In Machine Learning for Healthcare)
- **Video Generation**: Performed a human pose transferring from video to video by training a GAN to generate fake videos using extracted human pose features from Densepose(In Machine Learning)

Teaching & Mentoring

MITx, Edx Cambridge, MA

Teaching Assitant for 6.86x Machine Learning with Python *2019*

- Class taught over 2,000 students in MITx Micro Masters Program in Statistics and Data Science
- Created notes, homework, projects and exam problems. Created and maintained online graders for exercises and project codes.
- Led the online discussion forum

Department of EECS, MIT Cambridge, MA

Teaching Assitant for 6.867 Machine Learning *2019*

- Graduate level machine learning class taught over 300 students
- Led recitation and discussion sections. Designed homework, exercises and exams

Undergraduate Research Mentor *2018 - 2019*

- Advised one MIT undergraduate student for research in computational cardiovascular research group

Skills

- **Programming:** Python, C++, Matlab, MySQL, Bash
- **Frameworks and Tools:** Git, Latex, Tensorflow and Keras

Additional Experience & Achievements

- Presented poster on *Generative Oversampling with Variational Autoencoder* at **MIT-IBM AI week**, 2019
- Hewlett Packard Fellowship, MIT EECS, 2017
- 3rd Place, **Citadel MIT Datathon**, 2018
- Treasurer, MIT Chinese Student and Scholar Association, 2018-2019

Publications

- 3 first author conference papers; 6 co-author