Rongye Shi

Email: rongyeshi@cmu.edu
Carnegie Mellon University
Pittsburgh, PA 15213, United States
https://www.andrew.cmu.edu/user/rongyes/

Educational Backgrounds

Carnegie Mellon University (CMU), Pittsburgh, PA, United States
Sep. 2014 - May 2019 **Ph.D.** in Electrical and Computer Engineering, QPA: 3.96/4.00
Advisors: Prof. Manuela M. Veloso and Prof. Peter Steenkiste
Sep. 2014 - May 2016 **M.S.** in Electrical and Computer Engineering
Peking University (PKU), Beijing, China
Sep. 2012 - Jul.2014 **M.E.** in Electronics and Communication Engineering, GPA: 3.9/4.0 (Rank 2/42)
China Agricultural University (CAU), Beijing, China
Sep. 2008 - Jul.2012 **B.S.** in Electronic Information Science and Technology, GPA: 3.91/4.00 (Rank 1/115)

Working Experience

May 2016 - Dec. 2016 **Research Specialist**, Department of Neurological Surgery, School of Medicine, the University of Pittsburgh, Pittsburgh, PA, United States. (Supervisor: Prof. Avniel Ghuman)

Selected Research Experience

Project 1 - Sense and Serve the Moving Cities (S2MovingCities) [This leads to my PhD thesis!]
- **Developed a novel Joint Modeling and Simulation Methodology** for simulating the passengers' on-vehicle experience and transferring indirect people mobility data to synthetic passenger data. [Paper in ITSC 2018]
- **Introduced Origin-Destination Inference** to leverage semi-supervised self-training paradigm to infer the missing destination information for entry-only passenger data. [Paper in BDCAT 2017]
- **Proposed Multi-Passenger Multi-Criteria Mobility Planning** to extend the Multi-Agent Path Planning algorithm, M*, to optimize multiple passengers' on-vehicle experience under soft-collision-free constraints and successfully applied the planner to the bus transit system in Porto, Portugal. [Paper 1 and Paper 2]

Project 2 - Unraveling the Information Flow through Brain Network Interactions for Face Visual Perception
- **Conducted machine learning analysis** with invasive EEG data to predict what image the patient is viewing
- **Developed phase-locking value analysis and permutation test** to verify face sensitive electrode pairs, and based on the locations of those electrodes, we studied how brain function areas communicate with other areas during face recognition task. [Presentation in JoV]

Project3 - Neuromorphic Computing
- **Studied pattern convergence** via oscillatory neural network (ONN) based on phase locked loop (PLL).
- **Designed new hardware architecture and technique** to reliably recognize distorted input patterns under random delay conditions. [Paper in IJCNN 2016]

Selected Course Projects

Project 1 - Deep Reinforcement Learning and Control
- Played CartPole/MountainCar/SpaceInvader with **Deep Q-networks** [see github for SpaceInvaders].
- Played LunarLander with **Imitation Learning, REINFORCE, and Advantage Actor-Critic algorithm** [see github]

Project 2 - Movement Decoding for Brain Computer Interfaces
- Implemented multi-class SVM classifier to real neural data to decode the body movements.
- Implemented the code in pure matrix operation to improve computation efficiency [Full Report].

Selected Honors and Awards

NSF Student Travel Award (BDCAT 2017)
Best Paper Award at ACM GLSVLSI 2017
2015 SONIC John Bardeen Student Research Award
2014 Google Excellence Scholarship

Relevant Skills and Backgrounds

Machine Learning, Deep Learning, Deep Reinforcement Learning, Statistics, Data Mining, Nonlinear/Convex Optimization, Multi-Robot Path Planning, Shortest Path Finding, Dynamical System, Neural Signal Processing, etc.
Programming in Python, MATLAB, SUMO (traffic simulator), Introduction level of CUDA C++ programming for GeForce GTX 1080Ti, etc.
Open source framework: TensorFlow, Keras, OpenAI, CVX

Teaching Assistant Experience

10-601 Introduction to Machine Learning (with Prof. Matthew R. Gormley)
18-859 Wireless Networks & Mobile Systems (with Prof. Swarun Kumar)