Jiawei Sun

✉ sunmessi@gmail.com
sjwramsey.github.io/jiaweisun.github.io/

Education

August 2015 – July 2019 **Northwestern Polytechnical University**, Xi'an, China.
B.Eng. in Information Engineering
GPA: 89/100, **Rank:** 1/50

August 2019 – April 2021 **University of Michigan**, Ann Arbor, MI.
M.Eng.(Expected) in Electrical and Computer Engineering
GPA: 4.0/4.0

Publications and/or Manuscripts

April 2020 **Modelling learning in C. elegans chemosensory and locomotive circuitry for T-maze navigation (in preparation)**
Sakelaris B., **Sun J.***, Li Z.*, Banerjee S., Booth V. and Gourgou E. *co-second author

Research Experiences

Sep 2019 – Present **Image Processing to decipher C. elegans locomotion in mazes**,
Advisor: Research Scientist Eleni Gourgou.
Working on finding the motion trails of the elegans
- Use the chan-vese active contour method and SVD to extract contours of the maze
- By the Procrustes Transformation method, a T-shape polygon is rotated and shifted to have maximal overlap with the extracted contour
- Apply the Frame Difference method to find motion trails of the elegans
- Use the the K-Nearest Neighbor (KNN) algorithm to smooth the motion trails

Jan 2020 – Present **Deep Neural Network for Spectrum Unfolding**,
Advisor: Professor Alfred Hero .
Working on Recurrent Neural Network (RNN) algorithm
- Propose the RNN architecture that mimics project gradient descent method from optimization theory
- Complete the Recurrent Neural Network code by Pytorch

March 2018 – June 2018 **Differential Microphones Arrays based on Differential Equation**,
Advisor: Professor Jie Chen and Professor Lijun Zhang.
Worked on Differential Microphones Arrays based on Differential Equation
- Proved that the polynomial of sinusoidal function is the solution of a differential equation and the differential equation corresponding to LDMA and CDMA are same

May 2017 – October 2017 **Distributed PCA by the Primal-Dual Method of Multipliers (PDMM)**,
Advisor: Professor Jie Chen.
Worked on Distributed Optimization Algorithm
- Distributed PCA method can be obtained by simply approximating the global correlation matrix via the Average Consensus Algorithm subroutine, so matrices are divided in columns
- Eigenvalue decomposition of the correlation matrix and reduced its dimension to p-dim by PDMM algorithm
- Programmed in Matlab to accomplish Distributed PCA

Selected Awards and Honors

November 2018 **Honorable Mention of the International Mathematical Contest in Modeling**.

November 2017 **First Prize Scholarship**, Northwestern Polytechnical University.
Top 15% in 200 students

November 2016 **National Scholarship**, Northwestern Polytechnical University.
0.2% national wide)

Selected Course Projects

March 2018 **Communication System Design**.
Achieved communication between two computers. Achieved source coding by ASIC code and adopted 2FSK modulation based on MATLAB

January 2018 **Development of Microphone Orientation System**.
Accomplished acoustic localization by Conventional Beamforming method and Direction of Arrival (DOA) location method

Skills

Programming Languages: Matlab, Julia, Python, HTML, LaTeX, PyTorch