# Jiawei Sun

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## Education

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| 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**

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**. | |
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| 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**. |
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| | 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