Yu Sun

GENERAL INFORMATION

Gender: Male **Date of Birth:** August 18, 1998 **Nationality:** P. R. CHINA
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EDUCATION

09/2020-06/2023 **University of Science and Technology of China (USTC)**

- Master of Engineering in Electronic Information
- **GPA:** 3.59/4.3
- **Awards:**
  - Second-class Academic Scholarship in 2021
  - First-class Academic Scholarship in 2022

09/2016-06/2020 **Zhejiang University (ZJU)**

- Bachelor of Agricultural Sciences in Horticulture
- **GPA:** 3.55/4.0
- **Awards:**
  - Third-class Academic Scholarship in 2017

RESEARCH EXPERIENCES

07/2021-now **Analysis of yolk granule movement in early embryos of *Caenorhabditis elegans* based on deep learning**

- Research work at the Lab for Multimodal Biomedical Imaging and Therapy (MBIT), Department of Precision Machinery and Precision Instrumentation, University of Science and Technology of China (USTC)
- **Supervisor:** Professor Kaiqin Chu and Professor Zachary J. Smith
- **Method:** Added upsampling branches in the encoder and utilized random cropping training methods
- **Contribution:** First to use deep learning method to segment yolk granules in embryos of *Caenorhabditis elegans*, greatly improved the segmentation accuracy
- **Responsibilities:**
  - Collected and labeled yolk granules dataset
  - Modified U-Net with upsampling branch, trained models for granule segmentation with patch-wise method
  - Analyzed the velocity and mode of granule movement
  - Drew figures and wrote paper, paper now is under review

09/2021-5/2022 **Lipid droplets segmentation in *Caenorhabditis elegans* based on deep learning using epi-illumination dark field microscopy with asymmetrical illumination**

- Research work at the Lab for Multimodal Biomedical Imaging and Therapy (MBIT), Department of Precision Machinery and Precision Instrumentation, University of Science and Technology of China (USTC)
- **Supervisor:** Professor Kaiqin Chu and Professor Zachary J. Smith
- **Method:** Utilized U-Net to replace traditional methods such as watershed and edge detection

- **Contribution:** Greatly improved the segmentation accuracy, proved that multi-modal input cannot improve the accuracy of segmentation
- **Responsibilities:**
  - Participated in building the optical system
  - Collected and labeled lipid droplets dataset
  - Built and trained models for multimodal lipid droplets segmentation
  - Drew figures and wrote part of the paper, revised and published the paper as co-first author

10/2020-07/2021 **Reconstruction of Caenorhabditis elegans Neurons Based on EDoF (Extend Depth of Field)**

- Research work at the Lab for Multimodal Biomedical Imaging and Therapy (MBIT), Department of Precision Machinery and Precision Instrumentation, University of Science and Technology of China (USTC)
- **Supervisor:** Professor Kaiqin Chu
- **Responsibilities:**
  - Implemented the algorithm of reconstructing two-dimensional neuron image from two orthogonal projections

SKILLS

Language Skills:

- TOFEL: 102
- Reading: 28/Listening: 28/Speaking: 22/Writing: 24

Programing Skills:

- Ability to program in C++, Python and Matlab
- Experience in CUDA programming and OpenMP
- Familiar with PyTorch framework

PUBLICATIONS

- Shi R[†], Sun Y[†], Fang J, Chen X, Smith ZJ* and Chu K* (2022), Asymmetrical Illumination Enables Lipid Droplets Segmentation in Caenorhabditis elegans Using Epi-Illumination Dark Field Microscopy. *Front. Phys.* 10:894797. doi: 10.3389/fphy.2022.894797
- Sun Y, Shi R, Chen X, Fang J, Smith ZJ* and Chu K*, Quantification of intra embryonic motions through label free and fast imaging of yolk granules. Under review.