Yihong Sun

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Education

Johns Hopkins University, Baltimore, MD 2018–2022
- B.S. in Computer Science, Neuroscience, and Applied Mathematics and Statistics 4.0 GPA
- B.A. in Cognitive Science

Certificates:
- Machine Learning by Stanford University

Achievement: Dean's List, USA Biology Olympiad Semi-Finalist, Silver in International Medicine Olympiad

Research Experience

Undergraduate Researcher at Computational Cognitive Science Group @ MIT 2021–Present
- Supervised by Dr. Josh Tenenbaum to model intuitive physics learning via visual stimulus.
- Project 1: Implemented Generalizable Dynamical Physics Estimator learned from single-view RGBD video sequences through reconstructing 3D objects internal modeled by Object-Centric Neural Radiance Fields.

Undergraduate Researcher at CCVL Group @ JHU 2019–Present
- Supervised by Dr. Alan Yuille to develop computer vision systems via interdisciplinary integration with human vision.
- Project 1: Implemented Context-Aware CompositionalNets for object detection under partial occlusions and regulated bias to contextual cues through context separation.
- Project 2: Extended Context-Aware CompositionalNets to perform weakly supervised instance amodal segmentation by exploiting spatial compositional priors.
- Project 3: Implemented Multi-Object Occlusion Reasoning by leveraging weakly supervised instance amodal segmentation.

Research Fellow at UCI Cancer Research Institute 2017–2018
- Created the Micropallet Array Image Processing Project in association with UCI Cancer Research Institute Nelson Laboratory.
- Project 1: Enhancing the advantages of the Micropallet Array Application via automating efficient analysis of radioactive marked cancer cell membrane expressions across multiple channels and cell lines.

Preprints

[1] **Yihong Sun**, Adam Kortylewski, Alan Yuille. *Weakly-Supervised Amodal Instance Segmentation with Compositional Priors*, **Under Review**

Publications (* Equal Contribution)

[1] Xiaoding Yuan, Adam Kortylewski, **Yihong Sun**, Alan Yuille. *Robust Instance Segmentation through Reasoning about Multi-Object Occlusion*, in Proceedings of the IEEE Conference on Computer Vision and Pattern Recognition (**CVPR**), 2021

[2] Angtian Wang*, **Yihong Sun***, Adam Kortylewski, Alan Yuille. *Robust Object Detection Under Occlusion With Context-Aware CompositionalNets*, in Proceedings of the IEEE Conference on Computer Vision and Pattern Recognition (**CVPR**), 2020

[3] Adam Kortylewski, Qing Liu, Angtian Wang, **Yihong Sun**, Alan Yuille. *Compositional Convolutional Neural Networks: A Robust and Interpretable Model for Object Recognition under Occlusion*, in International Journal of Computer Vision (**IJCV**), 2020

Teaching

AS.050.375/675 Probabilistic Models of the Visual Cortex Fall 2021
- Course Assistant for Dr. Alan Yuille

EN.601.226 Data Structures Spring 2021
- Head Course Assistant for Dr. Ali Madooei

AS.050.375/675 Probabilistic Models of the Visual Cortex Fall 2020
- Course Assistant for Dr. Alan Yuille

EN.601.226 Data Structures Fall 2020
- Course Assistant for Dr. Ali Madooei

EN.601.226 Data Structures Spring 2020
- Course Assistant for Dr. Ali Madooei

Professional Experience

EN.601.226 Data Structures Course Development 2020
- Developed course materials including lecture slides, in-class exercises, homework problems, exam materials that are deployed in the following semesters.

Chief Technology Officer of Cellular Analysis Technologies 2018–2019
- Led the development team to tackle the analysis of complex cell lines using machine learning techniques to maximize accuracy and efficiency, while minimizing the cost of cellular analysis.
- Completed development team expansion via campuswide recruitment.
- Secured the Microsoft AI Student Acceleration Grant.

Intern at Science Discovery Cube, Santa Ana, CA 2015–2018
- Cumulated over 200 hours of work experience at various positions in a children science museum.

Skills

Programming Languages and Frameworks
- Experienced: PyTorch, OpenCV, Python, Java, C++, R, MATLAB, Git, and LINUX.
- Comfortable: Tensorflow, C, HTML, and Xcode App Development.

Concepts
- Object-Oriented Programming, Convolutional Neural Networks, Probabilistic Compositional Models, Deep Learning, Out-of-distribution Generalization, and Neural Architecture Learning.

Service & Outreach

Upsilon Pi Epsilon Honor Society Member 2020 – Present
- Member of the JHU chapter of Upsilon Pi Epsilon, the national honor society in Computer Science.

CS Small Group Mentor 2020
- Organized weekly meetings with incoming freshmen which is accompanied by an graduated alumni and department faculty professor to discuss current CS and AI topics and address any academic concerns to ensure a successful beginning of their academic career.

Nu Rho Psi Honor Society Member 2018 – 2020
- Member of the JHU chapter of Nu Rho Psi, the national honor society in Neuroscience.