Siming He

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EDUCATION

The University of Pennsylvania | School of Engineering and Applied Science, The Wharton School *May 2024*
Candidate for Bachelor of Science in Engineering (Computer and Information Science with Mathematics Minor)
Candidate for Bachelor of Science in Economics (Statistics)
Cumulative GPA: 3.92 / 4.0 *Major GPA:* 3.95 / 4.0
*Relevant Courses (courses with * are graduate-level courses):* Learning in Robotics*, Convex Optimization*, Computer Vision*, Deep Learning*, Probability Theory*, Machine Learning*, Advanced Linear Algebra*, Bayesian Statistics, Mathematical Statistics, Real Analysis, Algorithm, Probability, Information Theory

TECHNICAL SKILLS

- **Software:** Python (PyTorch, Scikit-learn, NumPy, Pandas, SciPy, OpenCV, Matplotlib), C++ (OpenCV, Eigen), ROS
- **Machine Learning:** CNNs, RNN, VAE, Reinforcement Learning, Transfer Learning, Neural ODE, Conformal Prediction
- **Robotics:** SLAM (ORB-SLAM3, VINS, Kimera, Voxblox, GTSAM), RRT and A* Planning, PID Control, Kalman Filters

RESEARCH EXPERIENCE

Vijay Kumar Lab, *Research Assistant* | Philadelphia, U.S. *January 2023 – Present*
- Improve visual-inertial odometry accuracy and robustness on a new drone platform with RealSense D435i and PX4 IMU
- Gather Penn Campus Point Cloud using Lidar for geometric and semantic mapping research

Wharton Summer Program for Undergraduate Research, *Researcher* (Paper) | Philadelphia, U.S. *May 2022 – August 2022*
- Worked with Prof. Pratik Chaudhari on Active SLAM with a self-build Quadrotor with RealSense D435i
- Used Kimera for state estimation and gained volumetric data (truncated signed distance field) of rooms by Voxblox
- Designed a path-planning algorithm that maximizes the mutual information between the map and observations
- Implemented fast voxel traversal algorithm for ray tracing and efficient ray-box intersection algorithm

Fang-Yen Laboratory, *Research Assistant* (Paper) | Philadelphia, U.S. *September 2021 – January 2022*
- Collaborated with Zihao Li in the development of an automated arm robot that can perform experiments on C. Elegans
- Applied computer vision algorithms to move a robot arm to the location of targeted Petri dishes, detect and decode barcode on the Petri dishes with 100% testing accuracy, and do automatic lens calibration to focus on worms

Penn Undergraduate Research Mentoring Program, *Research Assistant* (Video) | Remote *May 2021 – August 2021*
- Implemented convolutional neural network using PyTorch and used objects detection algorithms such as YOLO
- Implemented Dijkstra's algorithm and RRT algorithm and PID controller

Tsinghua University, *Research Assistant* (Paper) | Beijing, China *January 2021 – March 2021*
- Contributed to a Heterogeneous Graph Neural Network Benchmark by thoroughly evaluating 3 existing papers
- Presented the experiment results in a paper published at the 2021 Conference on Knowledge Discovery and Data Mining

Sign Language Translator, *Researcher* (Paper) | St. Catharines, Canada *January 2019 – December 2019*
- Developed an LSTM network that translates sign language videos into text with 93.66 percent accuracy

OTHER EXPERIENCE

Penn Center for Undergraduate Research & Fellowships, *Peer Research Advisor* | Philadelphia, U.S. *October 2022 – Present*
- Provide consultation for undergraduate researchers regarding research opportunities, faculty mentors, and research grants
- Mentor 10 1st and 2nd year students who are interested in doing computer science, robotics, statistics research
- Design and hold Python Programming for Research Workshop to introduce python and common packages

Robust Transfer Learning with Minimal Spurious Features, *Project* | Philadelphia, U.S. *October 2022 – December 2022*
- Shown task interpolation-based transfer algorithm can prevent the transfer of spurious features

Conformal Risk Control in Generalist Cellular Segmentation, *Project* | Philadelphia, U.S. *October 2022 – December 2022*
- Implemented conformal risk control on cellular segmentation task and shown semantic segmentation FNR is controlled

CIS 520 Machine Learning, *Teaching Assistant* | Philadelphia, U.S. *August 2022 – December 2022*
- Led weekly recitations of 22 students and taught machine learning concepts; designed homework and exam problems
- Held office hours weekly to help students on understanding course materials and homework problems

INTERESTS

- Swimming (The Second Level Athlete in China), Soccer & Tennis (high school varsity team), Cooking, Reading