Guangyuan Weng

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EDUCATION

Northeastern University Sep 2021 - Aug 2026 (Expected)

Ph.D. Student, Computer and Information Sciences *Boston, MA*

· Advisor: Prof. Huaizu Jiang

· Research Interests: Visual Compositional/Cognitive Reasoning

ShanghaiTech University Sep 2017 - Jul 2021

B.E., Computer Science and Technology *Shanghai, China*

· Advisors: Prof. David J. Crandall (Indiana University), Prof. Haipeng Zhang

RESEARCH EXPERIENCE

Visual Intelligence Lab, Northeastern University Sep 2021 - Present

Research Assistant (Advisor: Huaizu Jiang) *Boston, MA*

· Exploring visual models' induction capability by few-shot learning and compositional reasoning of novel concepts

· Learning contrastively by modeling novel concepts using synthetic data

· Developing models for human-object relation representation in the real word

IU Computer Vision Lab, Indiana University Jul 2020 - Jun 2021

Remote Research Intern (Advisor: Prof. David J. Crandall) *Bloomington, IN*

· Focused on recognizing human actions in videos captured from *egocentric cameras* (e.g., google glass)

· Discovered how action-object associations in datasets influence the generalization ability of action recognition models

· Trained a *graph convolutional neural network* to model the positions and sizes of hands and objects in the videos

Financial Intelligence Lab, ShanghaiTech University Mar 2020 - Jun 2021

Undergraduate Research Assistant (Advisor: Prof. Haipeng Zhang) *Shanghai, China*

· Investigated general rules of human *Venture Capital* (VC) investment behavior

· Discovered the influencing factors of VC investment behavior, e.g., focus level, academic achievements, etc.

· Constructed a *mathematical model* to simulate human choice and consequence outcomes by *Maximum Likelihood Estimation* (MLE), using large-scale data from *PitchBook Data, Inc.*

Mobile Autonomous Robotic Systems Lab (MARS Lab) Sep 2018 - Jan 2020

Undergraduate Research Assistant (Advisor: Prof. Sören Schwertfeger) *Shanghai, China*

· Built a mapping/SLAM robot with super-precise timing and localization with hardware synchronization

· Designed a *printed circuit board* (PCB) mounted on a field robotics research platform to produce synchronized signal for all sensors (e.g., IMUs and lidars) and reduce noise of trigger signal

· Generated three high-resolution and sensor-dense datasets to evaluate the performance of SLAM algorithms

PUBLICATIONS

Action Recognition based on Cross-Situational Action-object Statistics

· Tsutsui, Satoshi, Wang, Xizi, **Weng, Guangyuan**, Zhang, Yayun, Crandall, David, Yu, Chen

· *12th IEEE International Conference on Development and Learning* (ICDL 2022)

Advanced Mapping Robot and High-Resolution Dataset

· Chen, H., Yang, Z., Zhao, X., **Weng, G.**, Wan, H., Luo, J., Ye, X., Zhao, Z., He, Z., Dong, T., Schwertfeger, S.

· Journal of *Robotics and Autonomous Systems*

Towards Generation and Evaluation of Comprehensive Mapping Robot Datasets

· Chen, H., Zhao, X., Luo, J., Yang, Z., Zhao, Z., Wan, H., Ye, X., **Weng, G.**, He, Z., Dong, T., Schwertfeger S.

· Workshop on Dataset Generation and Benchmarking of SLAM Algorithms for Robotics and VR/AR of the *2019 IEEE International Conference on Robotics and Automation* (ICRAW 2019)

ACADEMIC PROJECTS

Slim Dog Apr 2020 - Jul 2019

· Built a partly 3D printed quadrupedal dog-like that can trot, and walk

· Calculated *Inverse Kinematics*, and *Virtual Leg Principal* and launch them on Arduino

Music Composition by Markov-Like Models Dec 2019 - Jan 2020

· Proposed two *Markov-Like Models* based on music theory, i.e., first-order and second-order models

· Trained multiple levels of *Markov-Like Models* on piano pieces from the modern era and improved the models' ability to generate new pieces; Python used

MCMC Based Inference for Galerkin System of Poisson's Equation Nov 2019 - Jan 2020

· Solved a Bayesian inverse problem in physical situation by *Markov Chain Monte Carlo* (MCMC)

· Utilized *Galerkin Approximation*, a method for converting a continuous operator problem to a discrete problem, to reduce the computational cost of *Bayesian inverse problems* without sacrificing much accuracy; MATLAB used

Pintos Operating System Sep 2019 - Jan 2020

· Pintos was developed for *Stanford*'s CS 140 operating system course as a successor to *Nachos*

· Developed *four modules* of an OS based on the original framework, more than *3,500* lines of C code

· Designed four interactive modules regard to the principles of multi-programming, scheduling, virtual memory, and file systems

ACTIVITIES

CS5330 Pattern Recognition and Computer Vision (21 Fall, 22 Fall) Sep 2022
Teaching Assistant *Boston, MA*

Upenn Curiosity AI Robotics and Smart Material Summer Camp Aug 2019
Teaching Assistant supervised by Prof. Jianbo Shi, GRASP Lab, University of Pennsylvania *Shanghai, China*

2018 IEEE ComSoc Summer School on Fog Computing Jun 2018
IEEE ComSoc, OpenFog Consortium *Shanghai, China*

HONORS

ShanghaiTech Merit Students (2019-2020, Top 5%) Dec 2020
ShanghaiTech University

ShanghaiTech Scholarship for Outstanding Undergraduate Students (RMB 30,000) Dec 2020
ShanghaiTech University

Global Talent Attraction Program, International Summer Research Fellowship ($ 4,000) Feb 2020
Indiana University Bloomington

SKILLS

Languages	Chinese (Native), English (TOEFL-iBT 112)
Computer Languages	Python, C++, C, Rust, MATLAB, AWK
Protocols & APIs	PyTorch, ROS, Processing (Java), LaTeX