

Education

University of California, Los Angeles

Ph.D. in Statistics, Center of Vision, Cognition, Learning, and Autonomy (VCLA); Advisor: Prof. Song-Chun Zhu

Los Angeles, CA

Sep 2017 - Present

University of California, Los Angeles

M.S. in Electrical Engineering; Advisor: Prof. Cheewei Wong

Los Angeles, CA

Sep 2015 - Jun 2017

University of Science and Technology of China (USTC)

B.S. in Electronic Information Engineering; School for the Gifted Young

Hefei, China

Aug 2011 - Jul 2015

Research Interests

Robotics

Robot learning through simulation environment

(Inverse) Reinforcement Learning

Learning from demonstration and robot skill learning

Intention Prediction

Modeling agent intention in driving scenario

Virtual Reality

Autonomous agent training in virtual reality

Publications

- [10] **X. Xie***, C. Li*, C. Zhang, Y. Zhu, S.C. Zhu. *Oral Pres.*
 “Learning Virtual Grasp with Failed Demonstrations via Bayesian Inverse Reinforcement Learning,” *IROS 2019*.
- [9] **X. Xie***, H. Liu*, Z. Zhang, Y. Qiu, F. Gao, S. Qi, Y. Zhu, S.C. Zhu. *Oral Pres.*
 “VRGym: A Virtual Testbed for Physical and Interactive AI (**Best Paper**),” *ACM TURC 2019*.
- [8] X. Gao, R. Gong, T. Shu, **X. Xie**, S. Wang, S.C. Zhu.
 “VRKitchen: an Interactive 3D Environment for Learning Real Life Cooking Tasks,” *ICML Workshop 2019*.
- [7] H. Liu*, Z. Zhang*, **X. Xie**, Y. Zhu, Y. Liu, Y. Wang, S.C. Zhu.
 “High-Fidelity Grasping in Virtual Reality using a Glove-based System,” *ICRA 2019*.
- [6] F. Hung*, **X. Xie***, A. Fuchs*, M. Walton, S. Qi, Y. Zhu, D. Lange, S.C. Zhu.
 “Intention-based Behavioral Anomaly Detection,” *AAAI Workshop 2019*.
- [5] **X. Xie***, H. Liu*, M. Edmonds, F. Gao, S. Qi, Y. Zhu, B. Rothrock, S.C. Zhu.
 “Unsupervised Learning using Hierarchical Models for Hand-Object Interactions,” *ICRA 2018*.
- [4] H. Liu*, Y. Zhang*, W. Si, **X. Xie**, Y. Zhu, S.C. Zhu.
 “Interactive Robot Knowledge Patching using Augmented Reality,” *ICRA 2018*.
- [3] M. Edmonds*, F. Gao*, **X. Xie**, H. Liu, S. Qi, Y. Zhu, B. Rothrock, S.C. Zhu. *Oral Pres.*
 “Feeling the Force: Integrating Force and Pose for Fluent Discovery through Imitation Learning to Open Medicine Bottles,” *IROS 2017*.
- [2] H. Liu*, **X. Xie***, M. Millar, M. Edmonds, F. Gao, Y. Zhu, V. Santos, B. Rothrock, S.C. Zhu. *Oral Pres.*
 “A Glove-based System for Studying Hand-Object Manipulation via Joint Pose and Force Sensing,” *IROS 2017*.
- [1] **X. Xie***, W. Zhou, H. Li, Q. Tian *Oral Pres.*
 “Rank-Aware Graph Fusion with Contextual Dissimilarity Measurement for Image Retrieval,” *ICIP 2015*.

(* indicates equal contribution)

Research

Virtual Reality Testbed for Physical and Interactive AI

Los Angeles, CA

Graduate Student Researcher; Center for Vision, Cognition, Learning, and Autonomy (VCLA)

Sep 2017 - Present

- A comprehensive VR platform -- VRGym: ingrates various VR hardware and ever-rich virtual scenes to emulate human-object interactions which achieve ever-realistic level.
- VRGym creates task-rich and data-rich environments, with underlying physics simulation powered by PhysX, various autonomy levels of tasks could be performed such as path planning and compositional tasks.
- VRGym provides a ROS-UE4 communication bridge such that popular robotics framework is compatible with virtual environment and human is to able to interact with robots inside virtual scene.

GTA VP²: A Dataset for Multi-Agent Path Prediction under Safety-Critical Scenarios

Los Angeles, CA

Graduate Student Researcher; Center for Vision, Cognition, Learning, and Autonomy (VCLA)

Mar 2018 - Present

- Design a new dataset that targets on highly interactive urban simulation environments for safety-critical scenarios involving multiple vehicles and pedestrians.
- The dataset contains ground truth of 3D agents trajectories, along with real-time RGB, depth frames serves the purpose of agent intention prediction.
- Develop a modding toolkit to increase scalability by manipulating game agents.
- Propose a new path prediction model that achieves comparably better performance than previous methods.

Unsupervised Learning of Hierarchical Models for Hand-Object Interactions using Tactile Glove

Los Angeles, CA

Graduate Student Researcher; Center for Vision, Cognition, Learning, and Autonomy (VCLA)

Sep 2016 - Sep 2017

- Present a general approach for unsupervisedly learn a stochastic grammar of hand-object interaction tasks.
- Capture hand manipulating data by self-made tactile glove in Vicon Motion Capture system.
- Sequence of atomic actions are composed into a temporal frame of knowledge (T-AOG) by grammar induction to generalize the structure of hand-object task realization.

Reinforcement Learning Library

Los Angeles, CA

Graduate Student Researcher; Center for Vision, Cognition, Learning, and Autonomy (VCLA)

Oct 2017 - Present

- Implement state-of-art RL method in a consistent architecture so that common modules are handy to be integrated.
- Multi-GPU or multi-process asynchronous methods developed to support different training features.
- Can easily run on simulation environment such as VRGym, OpenAI Gym, Mujoco .etc.

Experience

International Center for AI and Robot Autonomy

Los Angeles, CA

Robotics Research Engineer Intern

Mar 2018 - Present

- Working on VRGym platform development for robotics research on physical and interactive AI.
- Working on Game Engine environment to study the autonomous driving topics.

Mesosopic Optics and Quantum Electronics Laboratory

Los Angeles, CA

Research Intern

Sep 2015 - Jun 2016

- Worked on quantum computing algorithms in form of high-level program LiQui|>.
- Entangled quantum states simulation in Microsoft F#.

Computer Science Department, Oxford University

Oxford, UK

Research Intern

Jun 2015 - Sep 2015

- Developed the software on ROS platform to learn a map using a vision-based quadrotor UAV.
- Applied EKF assists with the map computation, followed by a planning algorithm to fulfill indoor navigation.

Skills

Programming C/C++, Python, Java, Shell, CUDA, LaTeX, Matlab, Javascript, HTML5, CSS

Topics Machine Learning, (Inverse) Reinforcement Learning, Statistical Modeling, Deep Learning

Honors & Awards

2019 **Student Best Paper Award**, ACM TURC

Chengdu, China

2018 **GPU Donation Program for Researchers**, NVIDIA

Los Angeles, CA

2018 **RAS Travel Grant**, ICRA

Brisbane, Australia

2015 **Young Fellow Scholarship Award**, MS-IEEE, Microsoft Research Asia

Beijing, China

2015 **Honorable Title of Excellent Undergraduate Students**, USTC

Hefei, China

2013 **The 1st Place of Robot Game Competition**, USTC

Hefei, China

Invited Talks

From Big Data to Big Task: VRGym, A Virtual Reality Testbed for Physical and Interactive AI

Long Beach, CA

CVPR Workshop: 3D Scene Understanding for Vision, Graphics and Robotics

Jun 2019

VRGym: A Virtual Reality Testbed for Physical and Interactive AI

Chengdu, China

ACM TURC Oral Presentation

May 2019