

Yuke Zhu

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OBJECTIVE My research objective is to teach robots to understand and to interact with the visual world. My research resides at the intersection of computer vision, machine learning, and robotics, with a focus on visual knowledge and deep reinforcement learning.

EDUCATION **Stanford University**, Stanford, CA, USA 2015 – Present
Ph.D. in Computer Science GPA: 4.0 / 4.0
Advisors: Fei-Fei Li, Silvio Savarese

Stanford University, Stanford, CA, USA 2013 – 2015
Master of Science in Computer Science GPA: 3.98 / 4.0
Advisors: Fei-Fei Li, Silvio Savarese

Simon Fraser University, Vancouver, BC, Canada 2011 – 2013
Bachelor of Science in Computer Science (first class with distinction) GPA: 4.27 / 4.3
Advisors: Greg Mori, Oliver Schulte

Zhejiang University, Hangzhou, China 2009 – 2013
Bachelor of Engineering in Computer Science and Technology GPA: 3.96 / 4.0
Ranked 1st out of 31 in the Dual Degree Program

- PUBLICATIONS**
- [23] Michelle A. Lee*, **Yuke Zhu***, Krishnan Srinivasan, Parth Shah, Silvio Savarese, Li Fei-Fei, Animesh Garg, Jeannette Bohg. Making Sense of Vision and Touch: Self-Supervised Learning of Multimodal Representations for Contact-Rich Tasks. *International Conference on Robotics and Automation (ICRA)*, 2019.
 - [22] Chen Wang, Danfei Xu, Yuke Zhu, Roberto Martn-Martn, Cewu Lu, Li Fei-Fei, Silvio Savarese. DenseFusion: 6D Object Pose Estimation by Iterative Dense Fusion. *IEEE Conference on Computer Vision and Pattern Recognition (CVPR)*, 2019.
 - [21] De-An Huang*, Suraj Nair*, Danfei Xu*, **Yuke Zhu**, Animesh Garg, Li Fei-Fei, Silvio Savarese, Juan Carlos Niebles. Neural Task Graphs: Generalizing to Unseen Tasks from a Single Video Demonstration. *IEEE Conference on Computer Vision and Pattern Recognition (CVPR)*, 2019.
 - [20] Linxi Fan*, **Yuke Zhu***, Jiren Zhu, Zihua Liu, Orien Zeng, Anchit Gupta, Joan Creus-Costa, Silvio Savarese, Li Fei-Fei. SURREAL: Open-Source Reinforcement Learning Framework and Robot Manipulation Benchmark. *Conferences on Robot Learning (CoRL)*, 2018.
 - [19] Ajay Mandlekar, **Yuke Zhu**, Animesh Garg, Jonathan Booher, Max Spero, Albert Tung, Julian Gao, John Emmons, Anchit Gupta, Emre Orbay, Silvio Savarese, Li Fei-Fei. RoboTurk: A Crowdsourcing Platform for Robotic Skill Learning through Imitation. *Conferences on Robot Learning (CoRL)*, 2018.
 - [18] **Yuke Zhu**, Ziyu Wang, Josh Merel, Andrei Rusu, Tom Erez, Serkan Cabi, Saran Tunyasuvunakool, Jnos Kramr, Raia Hadsell, Nando de Freitas, Nicolas Heess. Reinforcement and Imitation Learning for Diverse Visuomotor Skills. *Robotics: Science and Systems (RSS)*, 2018.

- [17] Kuan Fang, **Yuke Zhu**, Animesh Garg, Virja Mehta, Andrey Kuryenkov, Li Fei-Fei, Silvio Savarese. Learning Task-Oriented Grasping for Tool Manipulation with Simulated Self-Supervision. *Robotics: Science and Systems (RSS)*, 2018
- [16] Danfei Xu*, Suraj Nair*, **Yuke Zhu**, Julian Gao, Animesh Garg, Li Fei-Fei, Silvio Savarese. Neural Task Programming: Learning to Generalize Across Hierarchical Tasks. *International Conference on Robotics and Automation (ICRA)*, 2018.
- [15] Bo Wang, Lin Huang, **Yuke Zhu**, Anshul Kundaje, Serafim Batzoglou, Anna Goldenberg. Vicus: Exploiting Local Structures to Improve Network-based Analysis of Biological Data. *PLOS Computational Biology*, 2017.
- [14] James Harrison*, Animesh Garg*, Boris Ivanovic, **Yuke Zhu**, Silvio Savarese, Li Fei-Fei, Marco Pavone. ADAPT: Zero-Shot Adaptive Policy Transfer for Stochastic Dynamical Systems. *International Symposium on Robotics Research (ISRR)*, 2017.
- [13] **Yuke Zhu***, Daniel Gordon*, Eric Kolve, Dieter Fox, Li Fei-Fei, Abhinav Gupta, Roozbeh Mottaghi, Ali Farhadi. Visual Semantic Planning using Deep Successor Representations. *International Conference on Computer Vision (ICCV)*, 2017.
- [12] Ajay Mandlekar*, **Yuke Zhu***, Animesh Garg*, Li Fei-Fei, Silvio Savarese. Adversarially Robust Policy Learning through Active Construction of Physically-Plausible Perturbations. *IEEE/RSJ International Conference on Intelligent Robots and Systems (IROS)*, 2017.
- [11] **Yuke Zhu**, Joseph J. Lim, Li Fei-Fei. Knowledge Acquisition for Visual Question Answering via Iterative Querying. *IEEE Conference on Computer Vision and Pattern Recognition (CVPR)*, 2017.
- [10] Danfei Xu, **Yuke Zhu**, Christopher B. Choy, Li Fei-Fei. Scene Graph Generation by Iterative Message Passing. *IEEE Conference on Computer Vision and Pattern Recognition (CVPR)*, 2017.
- [9] **Yuke Zhu**, Roozbeh Mottaghi, Eric Kolve, Joseph J. Lim, Abhinav Gupta, Li Fei-Fei, Ali Farhadi. Target-driven Visual Navigation in Indoor Scenes using Deep Reinforcement Learning. *IEEE International Conference on Robotics and Automation (ICRA)*, 2017.
- [8] Ranjay Krishna, **Yuke Zhu**, Oliver Groth, Justin Johnson, Kenji Hata, Joshua Kravitz, Stephanie Chen, Yannis Kalanditis, Li-Jia Li, David A. Shamma, Michael Bernstein, Li Fei-Fei. Visual Genome: Connecting Language and Vision Using Crowdsourced Dense Image Annotations. *International Journal of Computer Vision (IJCV)*, 2017.
- [7] **Yuke Zhu**, Groth Oliver, Michael Bernstein, Li Fei-Fei. Visual7W: Grounded Question Answering in Images. *IEEE Conference on Computer Vision and Pattern Recognition (CVPR)*, 2016.
- [6] Tian Lan*, **Yuke Zhu***, Amir Zamir, Silvio Savarese. Action Recognition by Hierarchical Mid-level Action Elements. *International Conference on Computer Vision (ICCV)*, 2015.
- [5] **Yuke Zhu**, Alireza Fathi, Li Fei-Fei. Reasoning About Object Affordances in a Knowledge Base Representation. *European Conference on Computer Vision (ECCV)*, 2014.
- [4] Oliver Schulte, Hassan Khosravi, Arthur Kirkpatrick, Tianxiang Gao, **Yuke Zhu**. Modelling Relational Statistics With Bayes Nets. *Machine Learning Journal* 94(1):105-125, 2014.

- [3] Alfred Zong and **Yuke Zhu**. StrokeBank: Automating Personalized Chinese Handwriting Generation. *AAAI Conference on Innovative Applications of Artificial Intelligence (IAAI)*, 2014.
- [2] Zhao Song and **Yuke Zhu**. Graphical Model-based Learning in High Dimensional Feature Spaces. *The Twenty-Seventh AAAI Conference on Artificial Intelligence (AAAI)*, 2013.
- [1] **Yuke Zhu**, Tian Lan, Yijian Yang, Steven Robinovitch, Greg Mori. Latent Spatio-temporal Models for Action Localization and Recognition in Nursing Home Surveillance Video. *IAPR International Conference on Machine Vision Applications (MVA)*, 2013.

TECHNICAL REPORTS

- [2] Eric Kolve, Roozbeh Mottaghi, Daniel Gordon, **Yuke Zhu**, Abhinav Gupta, Ali Farhadi. AI2-THOR: An Interactive 3D Environment for Visual AI. *arXiv:1712.05474*, 2017.
- [1] **Yuke Zhu**, Ce Zhang, Christopher R, Li Fei-Fei. Building a Large-scale Multimodal Knowledge Base System for Answering Visual Queries. *arXiv:1507.05670*, 2015.

SERVICES

Conference Reviewing

- IEEE Conference on Computer Vision and Pattern Recognition (CVPR)
- International Conference on Computer Vision (ICCV)
- European Conference on Computer Vision (ECCV)
- Asian Conference on Computer Vision (ACCV)
- International Conference on Intelligent Robots and Systems (IROS)
- International Conference on Robotics and Automation (ICRA)
- International Conference on Humanoid Robots (Humanoids)
- Conference on Neural Information Processing Systems (NeurIPS)
- International Conference on Machine Learning (ICML)
- Conference on Robot Learning (CoRL)

Journal Reviewing

- IEEE Transactions on Pattern Analysis and Machine Intelligence (T-PAMI)
- IEEE Transactions on Multimedia (T-MM)
- IEEE Robotics and Automation Letters (RA-L)
- ACM Computing Surveys (CSUR)

Workshop Organizing

- *Program Committee*, Workshop on Multitask and Lifelong Reinforcement Learning, International Conference on Machine Learning (ICML), 2019
- *Co-organizer*, Workshop on Perspectives in Robot Learning: Causality and Imitation, Robotics: Science and Systems (RSS), 2018
- *Program Committee*, RSS Pioneers, Robotics: Science and Systems (RSS), 2019
- *Program Committee*, Workshop on Vision in Practice on Autonomous Robots (ViPAR), International Conference on Computer Vision (ICCV), 2017
- *Program Committee*, Workshop on Challenges in Robot Learning, Conference on Neural Information Processing Systems (NeurIPS), 2017

Outreach Program

- *Undergraduate Mentor*, Stanford AI Undergraduate Mentoring Program 2018

SPEECHES

“Closing the Perception Loop”

- Georgia Institute of Technology, Atlanta, GA Apr 2019
- University of Southern California, Los Angeles, CA Apr 2019
- McGill University, Montreal, QC, Canada Apr 2019
- Yale University, New Haven, CT Mar 2019
- New York University, New York, NY Mar 2019
- University of Toronto, Toronto, ON, Canada Mar 2019
- Carnegie Mellon University, Robotics Institute, Pittsburgh, PA Feb 2019
- University of Texas at Austin, Austin, TX Feb 2019
- Princeton University, Princeton, NJ Feb 2019
- Massachusetts Institute of Technology, Boston, MA Dec 2018
- Stanford University, Stanford, CA Nov 2018

“Towards Generalizable Robot Learning with Perceptual Intelligence”

- Chinese University of Hong Kong Shenzhen, Shenzhen, China Mar 2018
- Workshop on Future Leaders of AI Retreat, Shanghai, China Dec 2017
- Shanghai Jiaotong University, Shanghai, China Dec 2017

“Knowledge Acquisition for Visual Question Answering”

- Stanford Semantics and Geometry Seminar, Stanford, CA Mar 2016

“Computer Vision Algorithms for Fall Detection”

- Technology for Injury Prevention in Seniors (TIPS) 3rd Annual Research Symposium, Vancouver, BC, Canada Nov 2012

TEACHING

Teaching Assistant, Stanford University Winter 2014 – 2015
CS231N: Convolutional Neural Networks for Visual Recognition

Teaching Assistant, Stanford University Fall 2014 – 2015
CS 131: Computer Vision: Foundations and Applications

Teaching Assistant, Stanford University Summer 2013 – 2014
CS 193C: Client-Side Internet Technologies

Teaching Assistant, Stanford University Spring 2013 – 2014
CS 431: High-Level Vision - Behaviors, Neurons and Computational Models

EMPLOYMENT

Research Intern Jun – Sept 2017
DeepMind Technologies Ltd., London, England, UK

- Deep reinforcement learning for vision-based robot manipulation

Research Intern Jun – Sept 2016
Allen Institute for Artificial Intelligence, Seattle, WA, USA

- Building photorealistic simulated 3D environments for visual AI and deep reinforcement learning models for visual navigation

Research Intern Jun – Sept 2016
Snap Inc., Venice, CA, USA

- Developing deep learning models for video understanding at scale in the Snap Research team

Software Engineer Intern Apr – July 2013
Twitter Inc., San Francisco, CA, USA
• Growth hacking in the Activation & Messaging team for Twitter user retention

Research Assistant Dec 2011 – Apr 2013
SFU Computational Logic Lab, Burnaby, BC, Canada
• Research in statistical relational learning of efficient learning and inference with Bayesian Networks and Markov Logic Networks

Research Assistant Jan 2012 – Apr 2013
SFU Vision and Media Lab, Burnaby, BC, Canada
• Research in action understanding of nursing home videos for Technology for Injury Prevention in Seniors (TIPS) program

Software Engineer Intern July – Aug 2011
Qingdao Topcomm Communication Co., Ltd., Qingdao, China
• Developing router testing framework for electric energy data acquisition system

HONORS & AWARDS

Scholarships and Fellowships

- Tencent AI Lab PhD Fellowship 2017 – 2018
- Simon Fraser University Open Scholarship 2012, 2013
- Simon Fraser University Entrance Scholarship 2011
- National Scholarship of China (Top 2% in Zhejiang University) 2010, 2011
- Zhejiang University First-class Academic Excellence Scholarship 2010, 2011
- Zhejiang University Research and Innovation Scholarship 2010

Awards and Prizes

- RSS Pioneers Workshop Travel Award 2018
- DDP Outstanding Academic Achievement Award 2014
- AAAI-14 Student Scholarship 2014
- Simon Fraser University Computing Science Graduation Award 2013
- Simon Fraser University President's Honour Roll 2012, 2013
- 1st Place in Simon Fraser University 8th Winter Programming Contest 2012
- 5th Place in the ACM Pacific Northwest Programming Contest 2012
- Gold Medal in the 8th ACM Programming Contest of Zhejiang Province 2010
- First Prize in the 10th ACM Programming Contest of Zhejiang University 2010
- First Prize in National Olympiad of Informatics in Shandong Province 2008

SELECTED PRESS COVERAGE

- [7] "RoboTurk: A Crowdsourcing Platform for Imitation Learning in Robotics," by Ingrid Fadelli, *Tech Xplore*. Nov 21, 2018.
- [6] "Robots Learn Tasks from People with Framework Developed by Stanford Researchers," by Sofie Bates, *Stanford News*. Oct 26, 2018.
- [5] "Robot See, Robot Do: Bots Learn by Watching Human Behavior," by Noah Kravitz, *Nvidia Blog*. Apr 3, 2018.
- [4] "Virtual Reality Training Ground Helps Robots Prepare for the Real World," by Luke Dormehl, *Digital Trends*. Feb 19, 2018.
- [3] "A Detailed Virtual House Will Help Robots Train to Become Your Butler," by Jackie Snow, *MIT Technology Review*. Feb 16, 2018.

[2] “AI2-THOR Interactive Simulation Teaches AI About Real World,” by Jeremy Hsu, *IEEE Spectrum*. Feb 15, 2018.

[1] “Next Big Test for AI: Making Sense of the World,” by Will Knight, *MIT Technology Review*. Jan 26, 2016.

MENTORING

Undergraduate Students

- Viraj Mehta (CS, Stanford) Next: Ph.D. student at CMU
- Suraj Nair (CS, Caltech) Next: Ph.D. student at Stanford
- Russell Kaplan (CS, Stanford) Next: Senior machine learning scientist at Tesla
- Jiren Zhu (Math, Stanford)
- Zihua Liu (CS, Stanford)
- Justin Rose (CS, Stanford)
- David Lin (Physics, Stanford)

Master’s Students

- Andrey Kurenkov (CS, Stanford) Next: Ph.D. student at Stanford
- Julian Gao (CS, Stanford) Next: Robotics engineer at Dexterity
- Alex Kaiyi Fu (CS, Stanford)

Ph.D. Students

- Danfei Xu (CS, Stanford)
- Kuan Fang (EE, Stanford)
- Jim Fan (CS, Stanford)
- Ajay Mandlekar (EE, Stanford)
- Michelle Lee (ME, Stanford)

Independent Research

- Yurong You (CS, SJTU) Next: Ph.D. student at Cornell
- Chen Wang (CS, SJTU)