

Siyuan Huang

Education

- 2016–Present **Ph.D. at University of California, Los Angeles (UCLA), CA, USA,**
Doctor of Philosophy, Department of Statistics.
○ Advisor: Professor Song-Chun Zhu
○ GPA: 4.0/4.0
- 2012–2016 **Tsinghua University (THU), Beijing, China,**
Bachelor of Engineering, Department of Automation.
○ GPA: 90/100

Research Interests

Computer Vision: 3D Scene Parsing & Reconstruction & Synthesis, Functionality & Affordance, Physical & Social Scene Understanding, 3D Representation Learning, Human-Object Interaction
Machine Learning: Graphical Model, Generative Model, Statistical Deep Learning, Symbolic Reasoning
Cognition: Human Social Perception, Intention Prediction, Theory of Mind
Robotics: 3D Perception, Human-Robot Interaction

Research Experience

- Sep 2016 **Center for Vision, Cognition, Learning and Autonomy (VCLA), UCLA,**
–Present Advisor: Professor Song-Chun Zhu, *Graduate Student Research.*
- Sep 2014 **Intelligent Vision Group (IVG), THU,**
–Apr 2016 Co-advisors: Professor Jiwen Lu & Professor Jie Zhou, *Research Intern.*
- July 2015 **Pattern Recognition and Image Processing (PRIP) Lab, MSU,**
–Sep 2015 Advisor: Anil K. Jain, *Research Intern.*

Industry Experience

- Jan 2021 **DeepMind, London, UK,**
–Apr 2021 Research Scientist Intern. Host: Viorica Patraucean, Simon Osindero.
Multimodal Learning
- Aug 2020 **Facebook, CA, USA,**
–Dec 2020 Research Intern. Host: Yuanlu Xu, Tony Tung.
3D Affordance Learning & Human Motion Generation
- Jun 2019 **DMAI Inc. (an AI startup), CA, USA,**
–Sep 2019 Research Intern.
Lead a team to develop 3D scene understanding and cognitive reasoning algorithms.
- Jun 2018 **DMAI Inc. (an AI startup), CA, USA,**
–Sep 2018 Research Intern.
Developed an algorithm for joint scene and human parsing.
- Nov 2014 **Sensetime Inc., Beijing, China,**
–May 2015 Research Intern.
Developed face recognition, detection and tracking algorithms

Publications

- ACL 2021 **Inter-GPS: Interpretable Geometry Problem Solving with Formal Language and Symbolic Reasoning**,
Oral Pan Lu, Ran Gong, Shibiao Jiang, Liang Qiu, Siyuan Huang, Xiaodan Liang, Song-Chun Zhu.
Annual Meetings of the Association for Computational Linguistics (ACL), 2021
- CVPR 2021 **Learning Neural Representation for Camera Pose by View Synthesis**,
Oral Yaxuan Zhu, Ruiqi Gao, **Siyuan Huang**, Song-Chun Zhu, Ying Nian Wu.
IEEE Conference on Computer Vision and Pattern Recognition (CVPR), 2021
- Manuscripts **Spatio-Temporal Self-Supervised Learning for 3D Scene Understanding**,
Siyuan Huang, Yichen Xie, Song-Chun Zhu, Yixin Zhu.
Submitted to CVPR 2021
- AAAI 2021 **Learning by Fixing: Solving Math Word Problems with Weak Supervision**,
Yining Hong, Qing Li, Daniel Ciao, **Siyuan Huang**, Song-Chun Zhu.
Association for the Advancement of Artificial Intelligence (AAAI), 2021
- AAAI 2021 **SMART: A Situation Model for Algebra Story Problems via Attributed Grammar**,
Yining Hong, Qing Li, Ran Gong, Daniel Ciao, **Siyuan Huang**, Song-Chun Zhu.
Association for the Advancement of Artificial Intelligence (AAAI), 2021
- Neural Computation **Learning vector representation of local content and matrix representation of local motion, with implications for V1**,
2020 Ruiqi Gao, Jianwen Xie, **Siyuan Huang**, Yufan Ren, Song-Chun Zhu, Ying Nian Wu.
Neural Computation, 2020
- ICML 2020 **Closed Loop Neural-Symbolic Learning via Integrating Neural Perception, Grammar Parsing, and Symbolic Reasoning**,
Qing Li, **Siyuan Huang**, Yining Hong, Yixin Chen, Ying Nian Wu, Song-Chun Zhu, International Conference on Machine Learning (ICML), 2020.
Best Paper Award in Bridge Between Perception and Reasoning: Graph Neural Networks & Beyond Workshop
- ECCV 2020 **A Competence-aware Curriculum for Visual Concepts Learning from Natural Supervision**,
Oral, 2% Qing Li, **Siyuan Huang**, Yining Hong, Song-Chun Zhu.
European Conference on Computer Vision (ECCV), 2020
- ECCV 2020 **LEMMA: A Multiview Dataset for Learning Multi-agent Multi-task Activities**,
Baoxiong Jia, Yixin Chen, **Siyuan Huang**, Yixin Zhu, Song-Chun Zhu.
European Conference on Computer Vision (ECCV), 2020
- Engineering **Dark, Beyond Deep: A Paradigm Shift to Cognitive AI with Humanlike Common Sense**,
2020 Yixin Zhu, Tao Gao, Lifeng Fan, **Siyuan Huang**, Mark Edmonds, Hangxin Liu, Feng Gao, Chi Zhang, Siyuan Qi, Ying Nian Wu, Joshua B. Tenenbaum, Song-Chun Zhu .
Engineering, Special Issue on Artificial Intelligence, 2020
- TPAMI 2020 **A Generalized Earley Parser for Human Activity Parsing and Prediction**,
Siyuan Qi, Baoxiong Jia, **Siyuan Huang**, Ping Wei, Song-Chun Zhu.
IEEE Transactions on Pattern Analysis and Machine Intelligence (TPAMI), 2020
- NeurIPS 2019 **3D Object Detection from a Single RGB Image via Perspective Points**,
Siyuan Huang, Yixin Chen, Tao Yuan, Siyuan Qi, Yixin Zhu, Song-Chun Zhu.
Advances in Neural Information Processing Systems (NeurIPS), 2019
- ICCV 2019 **Holistic++ Scene Understanding: Single-view 3D Holistic Scene Parsing and Human Pose Estimation with Human-Object Interaction and Physical Commonsense**,
Yixin Chen*, **Siyuan Huang***, Tao Yuan, Siyuan Qi, Yixin Zhu, Song-Chun Zhu.
IEEE International Conference on Computer Vision (ICCV), 2019
- ICCV 2019 **Understanding Human Gaze Communication by Spatio-Temporal Graph Reasoning**,
Lifeng Fan*, Wenguan Wang*, **Siyuan Huang**, Siyuan Qi, Xinyu Tang, Song-Chun Zhu.
IEEE International Conference on Computer Vision (ICCV), 2019

- NeurIPS 2018 **Cooperative Holistic Scene Understanding: Unifying 3D Object, Layout, and Camera Pose Estimation**,
Siyuan Huang, Siyuan Qi, Yinxue Xiao, Yixin Zhu, Ying Nian Wu, Song-Chun Zhu.
 Advances in Neural Information Processing Systems (NeurIPS), 2018
- ECCV 2018 **Holistic 3D Scene Parsing and Reconstruction from a Single RGB Image**,
Siyuan Huang, Siyuan Qi, Yixin Zhu, Yinxue Xiao, Yuanlu Xu, Song-Chun Zhu.
 European Conference on Computer Vision (ECCV), 2018
- IJCV 2018 **Configurable 3D Scene Synthesis and 2D Image Rendering with Per-Pixel Ground Truth using Stochastic Grammars**,
 Chenfanfu Jiang*, Siyuan Qi*, Yixin Zhu*, **Siyuan Huang***, Jenny Lin, Xingwen Guo, Lap-Fai Yu, Demetri Terzopoulos, Song-Chun Zhu.
 International Journal of Computer Vision (IJCV), 2018
- CVPR 2018 **Human-centric Indoor Scene Synthesis using Stochastic Grammar**,
 Siyuan Qi, Yixin Zhu, **Siyuan Huang**, Chenfanfu Jiang, Song-Chun Zhu.
 IEEE Conference on Computer Vision and Pattern Recognition (CVPR), 2018
- ICCV 2017 **Predicting Human Activities Using Stochastic Grammar**,
 Siyuan Qi, **Siyuan Huang**, Ping Wei, Song-Chun Zhu.
 IEEE International Conference on Computer Vision (ICCV), 2017
- Pre-Print **Nonlinear Local Metric Learning for Person Re-identification**,
Siyuan Huang, Jiwen Lu, Jie Zhou, Anil K. Jain.
 Arxiv 1511.05169
- ICIP 2015 **Building Change Detection Based on 3D reconstruction**,
 Baohua Chen, Lei Deng, Yueqi Duan, **Siyuan Huang**, Jie Zhou .
 IEEE International Conference on Image Processing (ICIP) 2015

Professional Activities

Workshop Organizations

- 2020 Lead the organization of the 2nd "3D Scene Understanding for Vision, Graphics and Robotics" workshop at IEEE Conference on Computer Vision and Pattern Recognition (CVPR) 2020
- 2019 Lead the organization of the 1st "3D Scene Understanding for Vision, Graphics and Robotics" workshop at IEEE Conference on Computer Vision and Pattern Recognition (CVPR) 2019

Conference Reviewer

- 2021 International Conference on Learning Representations (ICLR)
- 2020 Conference on Empirical Methods in Natural Language Processing (EMNLP)
- 2020 AAAI Conference on Artificial Intelligence (AAAI)
- 2020 International Conference on Machine Learning (ICML)
- 2020 European Conference on Computer Vision (ECCV)
- 2019 IEEE International Conference on Computer Vision (ICCV)
- 2019-2020 Advances in Neural Information Processing Systems (NeurIPS)
- 2018-2021 IEEE Conference on Computer Vision and Pattern Recognition (CVPR)

Journal Reviewer

International Journal of Computer Vision (IJCV)

Awards and Scholarships

- 2020 Best Paper Award, ICML Workshop on Bridge Between Perception and Reasoning: Graph Neural Networks & Beyond
- 2020 UCLA Dissertation Year Fellowship
- 2019 Doctoral Travel Award, Neural Information Processing Systems (NeurIPS)
- 2019 Doctoral Travel Award, IEEE International Conference on Computer Vision (ICCV)

- 2018 Doctoral Travel Award, Neural Information Processing Systems (NeurIPS)
- 2018 Doctoral Travel Award, Department of Statistics, UCLA
- 2015 Scholarship of Excellent Academic Performance, Tsinghua University
- 2014 HAGE Scholarship, Department of Automation, Tsinghua University
- 2013 Comprehensive Merit Scholarship, Tsinghua University
- 2013 Second Prize, National Physics Contest of College Students

Invited Talks

- 2021.4 **Towards Streaming Video Transformer**, DeepMind
- 2021.3 **Self-supervised Representation Learning**, Reasoning Lab, UCLA Psychology Department, Host: Prof. Holyoak Keith
- 2021.2 **Human-like Scene Understanding and Reasoning**, The Computational Vision and Learning (CVL) Lab, UCLA Psychology Department, Host: Prof. Hongjing Lu
- 2020.11 **Task-oriented 4D Human Motion Generation with Scene Context**, MURI Annual Meeting
- 2020.10 **Task-oriented 4D Human Motion Generation with Scene Context**, Facebook Reality Lab

University Service

- 2019-2020 Student Reviewer, UCLA Statistics & Computer Science Graduate Admission
- 2019-2020 Student Reviewer, UCLA-CSST Program Admission