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RESEARCH INTERESTS	<b>Computer Vision</b> Functional Object and Scene Understanding <b>Computer Graphics</b> Physics-based Simulation <b>Cognitive Science</b> Intuitive Physics, Causal Reasoning <b>Robotics</b> Functional Manipulation <b>Virtual Reality</b> Physical Reasoning inside VR Environments
EDUCATION	Ph.D. in Statistics, UCLA <span style="float: right;">April 2018</span> Advisor: Prof. Song-Chun Zhu. Funded by <ul style="list-style-type: none"> <li>- DARPA XAI N66001-17-2-4029 <i>Learning and Communicating Explainable Representations for Analytics and Autonomy</i></li> <li>- ONR MURI N00014-16-1-2007 <i>Understanding Scenes and Events through Joint Parsing, Cognitive Reasoning and Lifelong Learning</i></li> <li>- DARPA SIMPLEX N66001-15-C-4035 <i>Learning Homogeneous Knowledge Representation from Heterogeneous Data for Quantitative and Qualitative Reasoning in Autonomy</i></li> <li>- DARPA MSEE FA 8650-11-1-7149 <i>SEE on a Unified Foundation for Representation, Inference and Learning</i></li> <li>- ONR MURI N00014-10-1-0933 <i>Knowledge Representation, Reasoning and Learning for Understanding Scenes and Events</i></li> <li>- NSF IIS-1423305 <i>Inferring the "Dark Matter" and "Dark Energy" from Image and Video</i></li> </ul> M.S. in Computer Science, UCLA <span style="float: right;">December 2013</span> B.E. in Software Engineering, Xi'an Jiaotong University, China <span style="float: right;">July 2012</span>
EXPERIENCES	Postdoctoral Scholar <span style="float: right;">April 2018 - present</span> Advisor: Prof. Song-Chun Zhu Center for Vision, Cognition, Learning and Autonomy (VCLA), UCLA VP of Operation <span style="float: right;">October 2018 - present</span> DMAI Research Director <span style="float: right;">January 2018 - present</span> DMAI Research Scientist <span style="float: right;">July 2018 - present</span> International Center for AI and Robot Autonomy (CARA) (NPO) Graduate Research Assistant <span style="float: right;">March 2013 - April 2018</span> Advisor: Prof. Song-Chun Zhu Center for Vision, Cognition, Learning and Autonomy (VCLA), UCLA Visiting Student <span style="float: right;">July 2017</span> Host: Prof. Chenfanfu Jiang Computer Graphics Group, Penn Research Intern <span style="float: right;">Summer 2012</span> Mentor: Prof. Gil Alterovitz Biomedical Cybernetics Laboratory, Harvard Medical School UCLA-CSST Program <span style="float: right;">Summer 2011</span> Advisor: Prof. Todd Millstein Computer Science Department, UCLA

AWARDS AND SCHOLARSHIPS	GPU Donation Program for Researchers, Nvidia	2018
	Outstanding Statistician Award, UCLA Statistics Department	2018
	RAS Travel Grant, ICRA	2018
	Outstanding Reviewer, CVPR	2017
	Doctoral Student Travel Grants, UCLA	2017
	Doctoral Student Travel Grants, UCLA Statistics Department	2017
	Sponsorship for VisionMeetsCognition Workshop at CVPR, Intel	2017
	Fellowship, University of California, Los Angeles	2015 - 2018
	CUDA Hardware Donation Program for Researchers, Nvidia	2014
	Honor Graduate Certificate, Xi'an Jiaotong University, China	2012
	Google Scholarship, Google	2011
	UCLA-CSST Scholarship, University of California, Los Angeles	2011
	Samsung Scholarship, Samsung	2010
Excellent Student Scholarship, Xi'an Jiaotong University, China	2008 - 2011	

- JOURNAL PUBLICATIONS
- \* denotes equal contribution
- [3] C. Jiang\*, S. Qi\*, **Y. Zhu\***, S. Huang\*, Jenny Lin, Lap-Fai Yu, D. Terzopoulos, and S.-C. Zhu. *Configurable 3D Scene Synthesis and 2D Image Rendering with Per-Pixel Ground Truth using Stochastic Grammars*. International Journal of Computer Vision (IJCV) 126.9 (2018): 920-941. doi:10.1007/s11263-018-1103-5
- [2] Y. Hu, Y. Fang, Z. Ge, Z. Qu, **Y. Zhu**, A. Pradhana, and C. Jiang. *A Moving Least Squares Material Point Method with Displacement Discontinuity and Two-Way Rigid Body Coupling*. ACM Transactions on Graphics (TOG) (Proceedings of ACM SIGGRAPH) 37.4 (2018): 150-163. doi:10.1145/3197517.3201293
- [1] T. Ye\*, S. Qi\*, J. Kubricht, **Y. Zhu**, H. Lu, and S.-C. Zhu. *The Martian: Examining Human Physical Judgments Across Virtual Gravity Fields*. Invited Talk at IEEE VR 2017 and VRLA 2017. IEEE Transactions on Visualization and Computer Graphics (TVCG) 23.4 (2017): 1399-1408. doi:10.1109/TVCG.2017.2657235

- CONFERENCE PUBLICATIONS
- \* denotes equal contribution
- [20] H. Liu, C. Zhang, **Y. Zhu**, C. Jiang, and S.-C. Zhu. *Mirroring without Overimitation: Learning Functionally Equivalent Manipulation Actions*. **[Spotlight]** 32nd AAAI Conference on Artificial Intelligence, 2019
- [19] C. Zhang, **Y. Zhu**, and S.-C. Zhu. *MetaStyle: Three-Way Trade-Off Among Speed, Flexibility and Quality in Neural Style Transfer*. **[Spotlight]** 32nd AAAI Conference on Artificial Intelligence, 2019
- [18] S. Huang, S. Qi, Y. Xiao, **Y. Zhu**, Y. N. Wu, and S.-C. Zhu. *Cooperative Holistic Scene Understanding: Unifying 3D Object, Layout, and Camera Pose Estimation*. 32nd Conference on Neural Information Processing Systems (NeurIPS), 2018
- [17] S. Huang, S. Qi, **Y. Zhu**, Y. Xiao, Y. Xu, and S.-C. Zhu. *3D Scene Parsing and Reconstruction from a Single RGB Image via Holistic Scene Grammar*. 15th European Conference on Computer Vision (ECCV), 2018

- [16] M. Edmonds\*, J. Kubricht\*, C. Summers, **Y. Zhu**, B. Rothrock, S.-C. Zhu, and H. Lu. *Human Causal Transfer: Challenges for Deep Reinforcement Learning*. [Oral] 40th Annual Conference of the Cognitive Science Society (CogSci), 2018.
- [15] S. Qi, **Y. Zhu**, S. Huang, C. Jiang, and S.-C. Zhu. *Human-centric Indoor Scene Synthesis using Stochastic Grammar*. 31st Computer Vision and Pattern Recognition (CVPR), 2018.
- [14] H. Liu\*, Y. Zhang\*, W. Si, X. Xie, **Y. Zhu**, and S.-C. Zhu. *Interactive Robot Knowledge Patching using Augmented Reality*. 35th International Conference on Robotics and Automation (ICRA), 2018.
- [13] X. Xie\*, H. Liu\*, M. Edmonds, F. Gao, S. Qi, **Y. Zhu**, B. Rothrock, and S.-C. Zhu. *Unsupervised Learning of Hierarchical Models for Hand-Object Interactions using Tactile Glove*. 35th International Conference on Robotics and Automation (ICRA), 2018.
- [12] D. Wang\*, J. Kubricht\*, **Y. Zhu\***, W. Liang, S.-C. Zhu, C. Jiang, and H. Lu. *Spatially Perturbed Collision Sounds Attenuate Perceived Causality in 3D Launching Events*. [Oral] 25th IEEE Conference on Virtual Reality and 3D User Interfaces (IEEE VR), 2018.
- [11] W. Liang, **Y. Zhu**, and S.-C. Zhu. *Tracking Occluded Objects and Recovering Incomplete Trajectories by Reasoning about Containment Relations and Human Actions*. [Spotlight] 32nd AAAI Conference on Artificial Intelligence (AAAI), 2018.
- [10] M. Edmonds\*, F. Gao\*, X. Xie, H. Liu, **Y. Zhu**, B. Rothrock, and S.-C. Zhu. *Feeling the Force: Integrating Force and Pose for Fluent Discovery through Imitation Learning to Open Medicine Bottles*. [Oral] 30th International Conference on Intelligent Robots and Systems (IROS), 2017.
- [9] H. Liu\*, X. Xie\*, M. Millar\*, M. Edmonds, F. Gao, **Y. Zhu**, V. J. Santos, B. Rothrock, and S.-C. Zhu. *A Glove-based System for Studying Hand-Object Manipulation via Pose and Force Sensing*. [Oral] 30th International Conference on Intelligent Robots and Systems (IROS), 2017.
- [8] J. Kubricht\*, **Y. Zhu\***, C. Jiang\*, D. Terzopoulos, S.-C. Zhu, and H. Lu. *Consistent Probabilistic Simulation Underlying Human Judgment in Substance Dynamics*. [Oral] 39th Annual Conference of the Cognitive Science Society (CogSci), 2017.
- [7] J. Lin\*, **Y. Zhu\***, J. Kubricht\*, S.-C. Zhu, and H. Lu. *Visuomotor Adaptation and Sensory Recalibration in Reversed Hand Movement Task*. 39th Annual Conference of the Cognitive Science Society (CogSci), 2017.
- [6] J. Lin\*, X. Guo\*, J. Shao\*, C. Jiang, **Y. Zhu**, and S.-C. Zhu. *A Virtual Reality Platform for Dynamic Human-Scene Interaction*. [Oral] ACM SIGGRAPH Asia 2016, Workshop on Virtual Reality meets Physical Reality
- [5] W. Liang, Y. Zhao, **Y. Zhu**, and S.-C. Zhu. *What is Where: Inferring Containment Relations from Videos*. [Oral] 25th International Joint Conference on Artificial Intelligence (IJCAI), 2016.
- [4] J. Kubricht\*, C. Jiang\*, **Y. Zhu\***, S.-C. Zhu, D. Terzopoulos, and H. Lu. *Probabilistic Simulation Predicts Human Performance on Viscous Fluid-Pouring Problem*. [Oral] 38th Annual Conference of the Cognitive Science Society (CogSci), 2016.
- [3] **Y. Zhu\***, C. Jiang\*, Y. Zhao, D. Terzopoulos, and S.-C. Zhu. *Inferring Forces and Learning Human Utilities From Videos*. [Oral] 29th Computer Vision and Pattern Recognition (CVPR), 2016.

- [2] W. Liang, Y. Zhao, **Y. Zhu**, and S.-C. Zhu.  
*Evaluating Human Cognition of Containing Relations with Physical Simulation*. [Oral]  
 37th Annual Conference of the Cognitive Science Society (CogSci), 2015.
- [1] **Y. Zhu\***, Y. Zhao\*, and S.-C. Zhu.  
*Understanding Tools: Task-Oriented Object Modeling, Learning and Recognition*.  
 28th Computer Vision and Pattern Recognition (CVPR), 2015.

TECHNICAL  
 REPORTS

J. Jeon, K. Micinski, J. Vaughan, N. Reddy, **Y. Zhu**, J. Foster, and T. Millstein.  
*Dr. Android and Mr. Hide: Fine-grained security policies on unmodified Android*.  
 Technical Reports of the Computer Science Department, University of Maryland,  
 2015

PROFESSIONAL  
 SERVICES

**Conference Organization**

Webmaster, Computer Vision and Pattern Recognition (CVPR) 2019

Co-chair, Computer Vision and Pattern Recognition (CVPR) 2018 Workshop on  
 Vision meets Cognition: Functionality, Physics, Intentionality and Causality

Co-chair, Computer Vision and Pattern Recognition (CVPR) 2017 Workshop on  
 Vision meets Cognition: Functionality, Physics, Intentionality and Causality

Co-chair, SIGGRAPH Asia 2016 Workshop on  
 Virtual Reality meets Physical Reality: Modelling and Simulating Virtual Humans  
 and Environments

Co-chair, CogSci 2016 Workshop on  
 Physical and Social Scene Understanding

Student Organizer, MURI Annual Review Meeting, UCLA, 2017.  
 Student Organizer, MURI Annual Review Meeting, Lake Arrowhead, 2015.

**Peer-reviewed Journals and Conferences**

**Computer Vision:**

Reviewer, International Journal of Computer Vision (IJCV)  
 Reviewer, Computer Vision and Pattern Recognition (CVPR), 2015-2019  
 Reviewer, International Conference on Computer Vision (ICCV), 2015-2017  
 Reviewer, European Conference on Computer Vision (ECCV), 2018  
 Reviewer, British Machine Vision Conference (BMVC), 2017-2018

**Cognitive Science:**

Reviewer, Annual Conference of the Cognitive Science Society (CogSci), 2015-2018

**Human-Computer Interaction:**

Reviewer, IEEE Virtual Reality and 3D User Interfaces (IEEE VR), 2018-2019  
 Reviewer, ACM User Interface Software and Technology Symposium (UIST), 2018  
 Reviewer, ACM Tangible, Embedded, and Embodied Interactions (TEI), 2019

**Department and University Services**

Faculty Leader, Peer Seminars in Math/Stat, UCLA-CSST, 2016  
 Student Reviewer, UCLA Computer Science Graduate Admission, 2015-2018  
 Student Reviewer, UCLA-CSST Program Admission, 2016-2018  
 PhD Student Ambassadors, UCLA Computer Science Department, 2016-2018

INVITED TALKS	Visual Commonsense Reasoning <i>at</i> PKU-UCLA JRI Annual Symposium	October 2018
	Object and Scene Understanding: From Passive Observation to Active Interaction <i>at</i> ONR MURI Annual Review Meeting	September 2018
	Visual Commonsense Reasoning <i>at</i> CVPR Workshop on Visual Understanding of Humans in Crowd Scene	June 2018
	Guest Lecture: Tools and Functionality <i>at</i> UCLA Statistics 232C: Cognitive Artificial Intelligence	May 2018
	Guest Lecture: How to Build a Cognitive Robot <i>at</i> UCLA Comm. Study 155: Artificial Intelligence and New Media	May 2017
	To Feel and Dream: Data for Intelligent Machine Beyond Images and Texts <i>at</i> Teddy Talk in plenary session at CRESSTCON 2016	September 2016
	Understanding Functionality and Affordance of Objects and Scenes <i>at</i> Beijing Institute of Technology	May 2016
	Functionality and Affordance of Objects and Scenes <i>at</i> Princeton Vision Group	February 2016
	Understanding Objects as Tools, Containers and Chairs <i>at</i> UCLA Computational Vision and Learning Lab	November 2015
	Learning from Human Demonstration: Understanding Objects as Tools <i>at</i> ONR MURI Annual Review Meeting	September 2015
	Understanding Tool Use: a Task-oriented Vision Problem <i>at</i> ONR MURI Annual Review Meeting	December 2014
	What is a Tool? Going beyond what is where <i>at</i> DARPA MSEE Annual Review Meeting	September 2014
IN THE PRESS	Our work on Scene Understanding was featured in UCLA Statistics Moments.	June 2016
	UCLA Daily Bruin Prime issued a special interview on our work. Title: "Give a Robot a Flesh"	May 2016
	Our work on "Understanding Tools" was featured in Statistics Department News.	June 2015
COLLABORATORS	– Prof. Chenfanfu Jiang <i>at</i> Computer Graphics Group, UPenn	
	– Prof. Demetri Terzopoulos <i>at</i> Computer Graphics & Vision Laboratory, UCLA	
	– Prof. Hongjing Lu <i>at</i> Computational Vision and Learning Lab, UCLA	
	– Dr. James Kubricht	

*at* GE Research

- Prof. Ying Nian Wu  
*at* Department of Statistics, UCLA
- Prof. Tao Gao  
*at* Department of Statistics and Communication Studies, UCLA
- Jiajun Wu  
*at* CASIL, MIT
- Prof. Wei Liang  
*at* Media Computing and Intelligent Systems Lab, Beijing Institute of Technology
- Dr. Brandon Rothrock  
*at* Jet Propulsion Laboratory, Caltech
- Dr. Yibiao Zhao  
*at* iSee.ai
- Prof. Lap-Fai (Craig) Yu  
*at* Graphics and Virtual Environments Lab, UMass Boston
- Prof. Tianfu Wu  
*at* NC State University (NCSU)
- Eric Peltola and Prof. Veronica Santos  
*at* Biomechatronics Lab, UCLA
- Michael Walton and Andrew Fuchs  
*at* SPAWAR, San Diego

STUDENTS  
MENTORED

- Shu Wang, PhD in Statistics, UCLA, 2018 Fall
- Wenwen Si, Master in Computer Vision, CMU, 2018 Fall
- Hangxin Liu, PhD in Computer Science, UCLA, 2018 Spring
- Jenny Lin, PhD in Computer Science, CMU, 2017 Fall
- Mark Edmonds, PhD in Computer Science, UCLA, 2017 Fall
- Tian Ye, Master in Robotics, CMU, 2017 Fall
- Feng Gao, Master in Statistics, UCLA, 2017 Fall
- Xu Xie, Master in Statistics, UCLA, 2017 Fall
- Xingwen Guo, Master in Computer Science, Yale, 2017 Fall
- Chi Zhang, Master in Computer Science, UCLA, 2017 Fall
- Jingyu Shao, Master in Statistics, UCLA, 2016 Winter
- Yutong Zhang, Master in Computer Science, UCLA, 2015 Fall