

Stanford



Jiajun Wu

Assistant Professor of Computer Science

CONTACT INFORMATION

- **Administrator**

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Bio

BIO

Jiajun Wu is an Assistant Professor of Computer Science at Stanford University, working on computer vision, machine learning, and computational cognitive science. Before joining Stanford, he was a Visiting Faculty Researcher at Google Research. He received his PhD in Electrical Engineering and Computer Science at Massachusetts Institute of Technology. Wu's research has been recognized through the ACM Doctoral Dissertation Award Honorable Mention, the AAAI/ACM SIGAI Doctoral Dissertation Award, the MIT George M. Sprowls PhD Thesis Award in Artificial Intelligence and Decision-Making, the 2020 Samsung AI Researcher of the Year, the IROS Best Paper Award on Cognitive Robotics, and faculty research awards and graduate fellowships from Samsung, Amazon, Facebook, Nvidia, and Adobe.

ACADEMIC APPOINTMENTS

- Assistant Professor, Computer Science
- Member, Bio-X
- Faculty Affiliate, Institute for Human-Centered Artificial Intelligence (HAI)
- Member, Wu Tsai Neurosciences Institute

HONORS AND AWARDS

- Amazon Research Award (ARA), Amazon (2021)
- Samsung AI Researcher of the Year, Samsung (2020)
- Samsung Global Research Outreach (GRO) Award, Samsung (2020)
- ACM Doctoral Dissertation Award Honorable Mention, ACM (2019)
- AAAI/ACM SIGAI Dissertation Award, AAAI/ACM (2019)
- George M. Sprowls PhD Thesis Award in Artificial Intelligence and Decision-Making, MIT (2019)
- IROS Best Paper Award on Cognitive Robotics, IEEE (2018)

PROGRAM AFFILIATIONS

- Symbolic Systems Program

PROFESSIONAL EDUCATION

- Ph.D., MIT , EECS (2020)
- S.M., MIT , EECS (2016)

LINKS

- Personal Site: <https://jiajunwu.com/>
- Google Scholar: <https://scholar.google.com/citations?user=2efgcS0AAAAJ&hl=en&oi=ao>

Teaching

COURSES

2021-22

- Computer Graphics in the Era of AI: CS 348I (Aut)
- Deep Learning for Computer Vision: CS 231N (Spr)
- Triangulating Intelligence: Melding Neuroscience, Psychology, and AI: CS 322, PSYCH 225 (Win)

2020-21

- Artificial Intelligence: Principles and Techniques: CS 221 (Win)
- Computer Graphics in the Era of AI: CS 348I (Aut)
- Computer Vision: Foundations and Applications: CS 131 (Aut)

STANFORD ADVISEES

Doctoral Dissertation Reader (AC)

Jim Fan, Jiaming Song

Postdoctoral Faculty Sponsor

Ruohan Gao, Huazhe Xu

Orals Evaluator

Jim Fan, Jiaming Song, Jiaxuan You, Michael Zhu

Doctoral Dissertation Advisor (AC)

Michael Lingelbach

Master's Program Advisor

Sophia Andrikopoulos, Mark Bechthold, Gordon Downs, Ishira Fernando, Callan Hoskins, John Mistele, Yinan Zhang, Qirui Zhou

Doctoral Dissertation Co-Advisor (AC)

Michelle Guo, Kyle Hsu, Sumith Kulal, Trevor Standley

Doctoral (Program)

Koven Yu, Yunzhi Zhang

Publications

PUBLICATIONS

- **Learning Generative Models of 3D Structures**
Chaudhuri, S., Ritchie, D., Wu, J., Xu, K., Zhang, H.

WILEY.2020: 643–66

- **Visual Dynamics: Stochastic Future Generation via Layered Cross Convolutional Networks** *IEEE TRANSACTIONS ON PATTERN ANALYSIS AND MACHINE INTELLIGENCE*
Xue, T., Wu, J., Bouman, K. L., Freeman, W. T.
2019; 41 (9): 2236–50
- **See, feel, act: Hierarchical learning for complex manipulation skills with multisensory fusion** *SCIENCE ROBOTICS*
Fazeli, N., Oller, M., Wu, J., Wu, Z., Tenenbaum, J. B., Rodriguez, A.
2019; 4 (26)
- **3D Interpreter Networks for Viewer-Centered Wireframe Modeling** *INTERNATIONAL JOURNAL OF COMPUTER VISION*
Wu, J., Xue, T., Lim, J. J., Tian, Y., Tenenbaum, J. B., Torralba, A., Freeman, W. T.
2018; 126 (9): 1009–26
- **Learning to Reconstruct Shapes from Unseen Classes**
Zhang, X., Zhang, Z., Zhang, C., Tenenbaum, J. B., Freeman, W. T., Wu, J., Bengio, S., Wallach, H., Larochelle, H., Grauman, K., CesaBianchi, N., Garnett, R.
NEURAL INFORMATION PROCESSING SYSTEMS (NIPS).2018
- **Learning a Probabilistic Latent Space of Object Shapes via 3D Generative-Adversarial Modeling**
Wu, J., Zhang, C., Xue, T., Freeman, W. T., Tenenbaum, J. B., Lee, D. D., Sugiyama, M., Luxburg, U. V., Guyon, Garnett, R.
NEURAL INFORMATION PROCESSING SYSTEMS (NIPS).2016
- **Galileo: Perceiving Physical Object Properties by Integrating a Physics Engine with Deep Learning**
Wu, J., Yildirim, I., Lim, J. J., Freeman, W. T., Tenenbaum, J. B., Cortes, C., Lawrence, N. D., Lee, D. D., Sugiyama, M., Garnett, R.
NEURAL INFORMATION PROCESSING SYSTEMS (NIPS).2015
- **End-to-End Optimization of Scene Layout**
Luo, A., Zhang, Z., Wu, J., Tenenbaum, J. B., IEEE
IEEE.2020: 3753–62
- **Perspective Plane Program Induction from a Single Image**
Li, Y., Mao, J., Zhang, X., Freeman, W. T., Tenenbaum, J. B., Wu, J., IEEE
IEEE.2020: 4433–42
- **Video Enhancement with Task-Oriented Flow** *INTERNATIONAL JOURNAL OF COMPUTER VISION*
Xue, T., Chen, B., Wu, J., Wei, D., Freeman, W. T.
2019; 127 (8): 1106–25
- **An integrative computational architecture for object-driven cortex** *CURRENT OPINION IN NEUROBIOLOGY*
Yildirim, I., Wu, J., Kanwisher, N., Tenenbaum, J.
2019; 55: 73–81
- **Visual Concept-Metaconcept Learning**
Han, C., Mao, J., Gan, C., Tenenbaum, J. B., Wu, J., Wallach, H., Larochelle, H., Beygelzimer, A., d'Alche-Buc, F., Fox, E., Garnett, R.
NEURAL INFORMATION PROCESSING SYSTEMS (NIPS).2019
- **Combining Physical Simulators and Object-Based Networks for Control**
Ajay, A., Bauza, M., Wu, J., Fazeli, N., Tenenbaum, J. B., Rodriguez, A., Kaelbling, L. P., IEEE, Howard, A., Althoefer, K., Arai, F., Arrichiello, F., Caputo, B., et al
IEEE.2019: 3217–23
- **Propagation Networks for Model-Based Control Under Partial Observation**
Li, Y., Wu, J., Zhu, J., Tenenbaum, J. B., Torralba, A., Tedrake, R., IEEE, Howard, A., Althoefer, K., Arai, F., Arrichiello, F., Caputo, B., Castellanos, J., et al
IEEE.2019: 1205–11
- **ChainQueen: A Real-Time Differentiable Physical Simulator for Soft Robotics**
Hu, Y., Liu, J., Spielberg, A., Tenenbaum, J. B., Freeman, W. T., Wu, J., Rus, D., Matusik, W., IEEE, Howard, A., Althoefer, K., Arai, F., Arrichiello, F., et al
IEEE.2019: 6265–71
- **Program-Guided Image Manipulators**

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- Mao, J., Zhang, X., Li, Y., Freeman, W. T., Tenenbaum, J. B., Wu, J., IEEE
IEEE COMPUTER SOC.2019: 4029–38
- **Modeling Expectation Violation in Intuitive Physics with Coarse Probabilistic Object Representations**
Smith, K. A., Mei, L., Yao, S., Wu, J., Spelke, E., Tenenbaum, J. B., Ullman, T. D., Wallach, H., Larochelle, H., Beygelzimer, A., d'Alche-Buc, F., Fox, E., Garnett, et al
NEURAL INFORMATION PROCESSING SYSTEMS (NIPS).2019
 - **Learning Sight from Sound: Ambient Sound Provides Supervision for Visual Learning** *INTERNATIONAL JOURNAL OF COMPUTER VISION*
Owens, A., Wu, J., McDermott, J. H., Freeman, W. T., Torralba, A.
2018; 126 (10): 1120–37
 - **Augmenting Physical Simulators with Stochastic Neural Networks: Case Study of Planar Pushing and Bouncing**
Ajay, A., Wu, J., Fazeli, N., Bauza, M., Kaelbling, L. P., Tenenbaum, J. B., Rodriguez, A., Kosecka, J., Maciejewski, A. A., Okamura, A., Bicchi, A., Stachniss, C., Song, et al
IEEE.2018: 3066–73
 - **Unsupervised Learning of Latent Physical Properties Using Perception-Prediction Networks**
Zheng, D., Luo, V., Wu, J., Tenenbaum, J. B., Globerson, A., Silva, R.
AUAI PRESS.2018: 497–507
 - **Physical Primitive Decomposition**
Liu, Z., Freeman, W. T., Tenenbaum, J. B., Wu, J., Ferrari, Hebert, M., Sminchisescu, C., Weiss, Y.
SPRINGER INTERNATIONAL PUBLISHING AG.2018: 3–20
 - **Seeing Tree Structure from Vibration**
Xue, T., Wu, J., Zhang, Z., Zhang, C., Tenenbaum, J. B., Freeman, W. T., Ferrari, Hebert, M., Sminchisescu, C., Weiss, Y.
SPRINGER INTERNATIONAL PUBLISHING AG.2018: 762–79
 - **MoSculp: Interactive Visualization of Shape and Time**
Zhang, X., Dekel, T., Xue, T., Owens, A., He, Q., Wu, J., Mueller, S., Freeman, W. T., Assoc Comp Machinery
ASSOC COMPUTING MACHINERY.2018: 275–85
 - **Attention Clusters: Purely Attention Based Local Feature Integration for Video Classification**
Long, X., Gan, C., de Melo, G., Wu, J., Liu, X., Wen, S., IEEE
IEEE.2018: 7834–43
 - **Pix3D: Dataset and Methods for Single-Image 3D Shape Modeling**
Sun, X., Wu, J., Zhang, X., Zhang, Z., Zhang, C., Xue, T., Tenenbaum, J. B., Freeman, W. T., IEEE
IEEE.2018: 2974–83
 - **3D Shape Perception from Monocular Vision, Touch, and Shape Priors**
Wang, S., Wu, J., Sun, X., Yuan, W., Freeman, W. T., Tenenbaum, J. B., Adelson, E. H., Kosecka, J., Maciejewski, A. A., Okamura, A., Bicchi, A., Stachniss, C., Song, et al
IEEE.2018: 1606–13
 - **3D-Aware Scene Manipulation via Inverse Graphics**
Yao, S., Hsu, T., Zhu, J., Wu, J., Torralba, A., Freeman, W. T., Tenenbaum, J. B., Bengio, S., Wallach, H., Larochelle, H., Grauman, K., CesaBianchi, N., Garnett, et al
NEURAL INFORMATION PROCESSING SYSTEMS (NIPS).2018
 - **Visual Object Networks: Image Generation with Disentangled 3D Representation**
Zhu, J., Zhang, Z., Zhang, C., Wu, J., Torralba, A., Tenenbaum, J. B., Freeman, W. T., Bengio, S., Wallach, H., Larochelle, H., Grauman, K., CesaBianchi, N., Garnett, et al
NEURAL INFORMATION PROCESSING SYSTEMS (NIPS).2018
 - **Learning to Exploit Stability for 3D Scene Parsing**
Du, Y., Liu, Z., Basevi, H., Leonardis, A., Freeman, W. T., Tenenbaum, J. B., Wu, J., Bengio, S., Wallach, H., Larochelle, H., Grauman, K., CesaBianchi, N., Garnett, et al
NEURAL INFORMATION PROCESSING SYSTEMS (NIPS).2018

- **Neural-Symbolic VQA: Disentangling Reasoning from Vision and Language Understanding**
Yi, K., Wu, J., Gan, C., Torralba, A., Kohli, P., Tenenbaum, J. B., Bengio, S., Wallach, H., Larochelle, H., Grauman, K., CesaBianchi, N., Garnett, R.
NEURAL INFORMATION PROCESSING SYSTEMS (NIPS).2018
- **Learning to See Physics via Visual De-animation**
Wu, J., Lu, E., Kohli, P., Freeman, W. T., Tenenbaum, J. B., Guyon, Luxburg, U. V., Bengio, S., Wallach, H., Fergus, R., Vishwanathan, S., Garnett, R.
NEURAL INFORMATION PROCESSING SYSTEMS (NIPS).2017
- **MarrNet: 3D Shape Reconstruction via 2.5D Sketches**
Wu, J., Wang, Y., Xue, T., Sun, X., Freeman, W. T., Tenenbaum, J. B., Guyon, Luxburg, U. V., Bengio, S., Wallach, H., Fergus, R., Vishwanathan, S., Garnett, R.
NEURAL INFORMATION PROCESSING SYSTEMS (NIPS).2017
- **Synthesizing 3D Shapes via Modeling Multi-View Depth Maps and Silhouettes with Deep Generative Networks**
Soltani, A., Huang, H., Wu, J., Kulkarni, T. D., Tenenbaum, J. B., IEEE
IEEE.2017: 2511–19
- **Neural Scene De-rendering**
Wu, J., Tenenbaum, J. B., Kohli, P., IEEE
IEEE.2017: 7035–43
- **Raster-to-Vector: Revisiting Floorplan Transformation**
Liu, C., Wu, J., Kohli, P., Furukawa, Y., IEEE
IEEE.2017: 2214–22
- **Generative Modeling of Audible Shapes for Object Perception**
Zhang, Z., Wu, J., Li, Q., Huang, Z., Traer, J., McDermott, J. H., Tenenbaum, J. B., Freeman, W. T., IEEE
IEEE.2017: 1260–69
- **Shape and Material from Sound**
Zhang, Z., Li, Q., Huang, Z., Wu, J., Tenenbaum, J. B., Freeman, W. T., Guyon, Luxburg, U. V., Bengio, S., Wallach, H., Fergus, R., Vishwanathan, S., Garnett, R.
NEURAL INFORMATION PROCESSING SYSTEMS (NIPS).2017
- **Self-Supervised Intrinsic Image Decomposition**
Janner, M., Wu, J., Kulkarni, T. D., Yildirim, I., Tenenbaum, J. B., Guyon, Luxburg, U. V., Bengio, S., Wallach, H., Fergus, R., Vishwanathan, S., Garnett, R.
NEURAL INFORMATION PROCESSING SYSTEMS (NIPS).2017
- **Visual Dynamics: Probabilistic Future Frame Synthesis via Cross Convolutional Networks**
Xue, T., Wu, J., Bouman, K. L., Freeman, W. T., Lee, D. D., Sugiyama, M., Luxburg, U. V., Guyon, Garnett, R.
NEURAL INFORMATION PROCESSING SYSTEMS (NIPS).2016
- **Single Image 3D Interpreter Network**
Wu, J., Xue, T., Lim, J. J., Tian, Y., Tenenbaum, J. B., Torralba, A., Freeman, W. T., Leibe, B., Matas, J., Sebe, N., Welling, M.
SPRINGER INT PUBLISHING AG.2016: 365–82
- **Ambient Sound Provides Supervision for Visual Learning**
Owens, A., Wu, J., McDermott, J. H., Freeman, W. T., Torralba, A., Leibe, B., Matas, J., Sebe, N., Welling, M.
SPRINGER INTERNATIONAL PUBLISHING AG.2016: 801–16
- **Unsupervised Object Class Discovery via Saliency-Guided Multiple Class Learning** *IEEE TRANSACTIONS ON PATTERN ANALYSIS AND MACHINE INTELLIGENCE*
Zhu, J., Wu, J., Xu, Y., Chang, E., Tu, Z.
2015; 37 (4): 862–75
- **Deep Multiple Instance Learning for Image Classification and Auto-Annotation**
Wu, J., Yu, Y., Huang, C., Yu, K., IEEE
IEEE.2015: 3460–69
- **MILCut: A Sweeping Line Multiple Instance Learning Paradigm for Interactive Image Segmentation**
Wu, J., Zhao, Y., Zhu, J., Luo, S., Tu, Z., IEEE
IEEE.2014: 256–63

- **Harvesting Mid-level Visual Concepts from Large-scale Internet Images**

Li, Q., Wu, J., Tul, Z., IEEE
IEEE.2013: 851–58

- **A classification approach to coreference in discharge summaries: 2011 i2b2 challenge** *JOURNAL OF THE AMERICAN MEDICAL INFORMATICS ASSOCIATION*

Xu, Y., Liu, J., Wu, J., Wang, Y., Tu, Z., Sun, J., Tsujii, J., Chang, E.
2012; 19 (5): 897–905

- **Unsupervised Object Class Discovery via Saliency-Guided Multiple Class Learning**

Zhu, J., Wu, J., Wei, Y., Chang, E., Tu, Z., IEEE
IEEE.2012: 3218–25