

# YILUN DU

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## Research Overview

My research is driven by the goal of developing AI agents that interact in the physical world, focusing on generative AI as a toolbox for solving such problems. A unique challenge in applying generative AI in this setting is the lack of available decision-making data and the necessity to generalize well to previously unseen situations. My work addresses this by proposing compositional generative modeling, where simple generative models are learned and composed together to construct complex generative models that generalize beyond the narrow amount of available data. My work has illustrated how such compositionality solves various problems in constructing AI agents ranging from complex scene understanding, trajectory planning, multimodal perception, and hierarchical planning. My work has further shown how such developed techniques can be broadly applied to settings in sciences and engineering.

**Research Areas:** Generative AI, Machine Learning, Computer Vision, Robotics, AI for Science.

## Education

<b>Ph.D.</b> EECS 2020-2024	Massachusetts Institute of Technology (MIT) Advisors: Leslie Kaelbling, Tomás Lozano-Pérez, and Joshua B. Tenenbaum Thesis: <i>Learning to Generate Compositionally</i>
<b>M.S.</b> EECS 2019-2020	Massachusetts Institute of Technology (MIT) Advisors: Leslie Kaelbling, Tomás Lozano-Pérez, and Joshua B. Tenenbaum Thesis: <i>Implicit Learning with Energy-Based Models</i>
<b>B.S.</b> 2015-2019	Massachusetts Institute of Technology (MIT) EECS, GPA: 5.0 / 5.0

## Employment

<b>Incoming Assistant Professor</b> Summer 2025	Harvard University Kempner Institute and Computer Science
<b>Senior Research Scientist</b> 2024-Now	Google Deepmind Research Scientist on the Deepmind Robotics Team
<b>Graduate Researcher</b> 2019-2024	Computer Science and Artificial Intelligence Lab, MIT LIS Group (PIs: Tomás Lozano-Pérez and Leslie Pack Kaelbling)
<b>Graduate Researcher</b> 2019-2024	Brain and Cognitive Science Department, MIT Computational Cognitive Science Lab (PI: Joshua Tenenbaum)
<b>Research Advisor</b> 2023-2024	Pika Labs Text-to-Video Synthesis / Running Research Projects

<b>Research Intern</b> Summer 2023	Google Robotics Research Intern Working on Video Models for Robotics
<b>Student Researcher</b> 2022-2023	Google Brain Student Researcher Working on Video Models for Decision Making
<b>Research Intern</b> Summer 2022	Deepmind Research Intern Working on Compositional Generative Modeling
<b>Visiting Researcher</b> 2020-2022	Facebook AI Research Visiting Researcher on the FAIR Proteins (Generative Biology) Team
<b>Research Intern</b> Summer 2019	Facebook AI Research Research Intern on the FAIR Proteins (Generative Biology) Team
<b>Research Fellow</b> Summer/Fall 2018	OpenAI Research Fellow Working on Generative Models

## Awards and Honors

Outstanding Paper Award at ICLR	2024
Best Paper Award at NeurIPS Instruction Following Workshop	2023
Outstanding Paper Award at ICRA RAP4Robots Workshop	2023
Qualcomm Fellowship Finalist	2022
Outstanding Paper Award at NeurIPS Workshop on Controllable Generative Modeling	2021
National Science Foundation (NSF) Graduate Research Fellowship	2020-2024
Open Philanthropy Fellowship Finalist	2020
International Biology Olympiad Gold Medal	2014,2015

## Publications

The \* sign denotes equal contribution.

### Peer-Reviewed Papers

- C74** Yiqing Xu, Jiayuan Mao, Yilun Du, Tomas Lozano-Perez, Leslie Kaelbling, David Hsu. “ "Set It Up!": Functional Object Arrangement with Compositional Generative Models” *Robotics Science and Systems (RSS)*, 2024.
- C73** Lirui Wang, Alan Zhao, Yilun Du, Ted Adelson, Russ Tedrake. “PoCo: Policy Composition from and for Heterogeneous Robot Learning” *Robotics Science and Systems (RSS)*, 2024.
- C72** Yilun Du, Leslie Kaelbling. “Compositional Generative Modeling: A Single Model is Not All You Need” *International Conference on Machine Learning (ICML)*, 2024.

- C71** Yilun Du, Shuang Li, Antonio Torralba, Joshua B. Tenenbaum, Igor Mordatch. “Improving Factuality and Reasoning in Language Models through Multiagent Debate” *International Conference on Machine Learning (ICML)*, 2024.
- C70** Yilun Du\*, Jiayuan Mao\*, Joshua B. Tenenbaum. “Learning Iterative Reasoning through Energy Diffusion” *International Conference on Machine Learning (ICML)*, 2024.
- C69** Yunhao Luo, Chen Sun, Joshua B. Tenenbaum, Yilun Du. “Potential Based Diffusion Motion Planning” *International Conference on Machine Learning (ICML)*, 2024.
- C68** Jocelin Su\*, Nan Liu\*, Yanbo Wang\*, Joshua B. Tenenbaum, Yilun Du. “Compositional Image De-composition with Diffusion Models” *International Conference on Machine Learning (ICML)*, 2024.
- C67** Siyuan Zhou, Yilun Du, Jiaben Chen, Yandong Li, Dit-Yan Yeung, Chuang Gan. “RoboDreamer: Learning Compositional World Models for Robot Imagination” *International Conference on Machine Learning (ICML)*, 2024.
- C66** Sherry Yang, Jacob Walker, Jack Parker-Holder, Yilun Du, Jake Bruce, Andre Barreto, Pieter Abbeel, Dale Schuurmans. “Video as the New Language for Real-World Decision Making” *International Conference on Machine Learning (ICML)*, 2024.
- C65** Haoyu Zhen, Xiaowen Qiu, Peihao Chen, Jincheng Yang, Xin Yan, Yilun Du, Yining Hong, Chuang Gan. “3D-VLA: A 3D Vision-Language-Action Generative World Model” *International Conference on Machine Learning (ICML)*, 2024.
- C64** Yilun Du, Sherry Yang, Pete Florence, Fei Xia, Ayzaan Wahid, Brian Ichter, Pierre Sermanet, Tianhe Yu, Pieter Abbeel, Joshua B. Tenenbaum, Leslie Kaelbling, Andy Zeng, Jonathan Tompson. “Video Language Planning” *International Conference on Learning Representations (ICLR)*, 2024.
- C63** Kevin Black\*, Michael Janner\*, Yilun Du, Ilya Kostrikov, Sergey Levine. “Training Diffusion Models with Reinforcement Learning” *International Conference on Learning Representations (ICLR)*, 2024.
- C62** Tailin Wu\*, Takashi Maruyama\*, Long Wei\*, Tao Zhang\*, Yilun Du\*, Gianluca Iaccarino, Jure Leskovec. “Compositional Generative Inverse Design” *International Conference on Learning Representations (ICLR)*, 2024.
- C61** Mengjiao Yang\*, Yilun Du\*, Bo Dai, Dale Schuurmans, Joshua B. Tenenbaum, Pieter Abbeel. “Probabilistic Adaptation of Text-to-Video Models” *International Conference on Learning Representations (ICLR)*, 2024.
- C60** Mengjiao Yang, Yilun Du, Kamyar Ghasemipour, Jonathan Tompson, Dale Schuurmans, Pieter Abbeel. “Learning Interactive Real-World Simulators” *International Conference on Learning Representations (ICLR)*, 2024.
- C59** Po-Chen Ko, Jiayuan Mao, Yilun Du, Shao-Hua Sun, Joshua B. Tenenbaum. “Learning to Act from Actionless Video through Dense Correspondences” *International Conference on Learning Representations (ICLR)*, 2024.
- C58** Yichen Li, Yilun Du, Chao Liu, Chao Liu, Francis Williams, Michael Foshey, Benjamin Eckart, Jan Kautz, Joshua B. Tenenbaum, Antonio Torralba, Wojciech Matusik. “Learning to Jointly Understand Visual and Tactile Signals” *International Conference on Learning Representations (ICLR)*, 2024.
- C57** Hongxin Zhang, Weihua Du, Jiaming Shan, Qinhong Zhou, Yilun Du, Joshua B. Tenenbaum, Tianmin Shu, Chuang Gan. “Building Cooperative Embodied Agents Modularly with Large Language Models” *International Conference on Learning Representations (ICLR)*, 2024.
- C56** Qinhong Zhou, Sunli Chen, Yisong Wang, Haozhe Xu, Weihua Du, Hongxin Zhang, Yilun Du, Joshua B. Tenenbaum, Chuang Gan. “BHAZARD Challenge: Embodied Decision Making in Dynamically Changing Environments” *International Conference on Learning Representations (ICLR)*, 2024.

- C55** Anurag Ajay\*, Seungwook Han\*, Yilun Du\*, Shuang Li, Abhi Gupta, Tommi Jaakkola, Joshua B. Tenenbaum, Leslie Kaelbling, Akash Srivastava, Pulkit Agrawal. “Compositional Foundation Models for Hierarchical Planning” *Neural Information Processing Systems (NeurIPS)*, 2023.
- C54** Yilun Du\*, Mengjiao Yang\*, Bo Dai, Hanjun Dai, Ofir Nachum, Joshua B. Tenenbaum, Dale Schuurmans, Pieter Abbeel. “Learning Universal Policies via Text-Guided Video Generation” *Neural Information Processing Systems (NeurIPS)*, 2023.
- C53** Siyuan Zhou, Yilun Du, Shun Zhang, Mengdi Xu, Yikang Shen, Wei Xiao, Dit-Yan Yeung, Chuang Gan. “Adaptive Online Replanning with Diffusion Models ” *Neural Information Processing Systems (NeurIPS)*, 2023.
- C52** Cameron Smith, Yilun Du, Ayush Tewari, Vincent Sitzmann. “FlowCam: Training Generalizable 3D Radiance Fields without Camera Poses via Pixel-Aligned Scene Flow ” *Neural Information Processing Systems (NeurIPS)*, 2023.
- C51** Yining Hong, Haoyu Zhen, Peihao Chen, Shuhong Zheng, Yilun Du, Zhenfang Chen, Chuang Gan. “3D-LLM: Injecting the 3D World into Large Language Models” *Neural Information Processing Systems (NeurIPS)*, 2023.
- C50** Tsun-Hsuan Wang, Juntian Zheng, Pingchuan Ma, Yilun Du, Byungchul Kim, Andrew Spielberg, Joshua B. Tenenbaum, Chuang Gan, Daniela Rus. “DiffuseBot: Breeding Soft Robots With Physics-Augmented Generative Diffusion Models” *Neural Information Processing Systems (NeurIPS)*, 2023.
- C49** Shengzhuang Chen, Long-Kai Huang, Jonathan Richard Schwarz, Yilun Du, Ying Wei. “Secure Out-of-Distribution Task Generalization with Energy-Based Models” *Neural Information Processing Systems (NeurIPS)*, 2023.
- C48** Zhutian Yang, Jiayuan Mao, Yilun Du, Jiajun Wu, Joshua B. Tenenbaum, Tomas Lozano-Perez, Leslie Kaelbling. “Compositional Diffusion-Based Continuous Constraint Solvers” *Conference on Robot Learning (CoRL)*, 2023.
- C47** Nan Liu\*, Yilun Du\*, Shuang Li\*, Joshua B. Tenenbaum, Antonio Torralba. “Unsupervised Compositional Concepts Discovery with Text-to-Image Generative Models” *International Conference on Computer Vision (ICCV)*, 2023.
- C46** Yilun Du, Conor Durkan, Robin Strudel, Joshua B. Tenenbaum, Sander Dieleman, Rob Fergus, Jascha Sohl-Dickstein, Arnaud Doucet, Will Grathwohl. “Reduce, Reuse, Recycle: Compositional Generation with Energy-Based Diffusion Models and MCMC” *International Conference on Machine Learning (ICML)*, 2023.
- C45** Armand Comas, Yilun Du, Christian Fernandez, Sandesh Ghimire, Mario Sznaiier, Joshua B. Tenenbaum, Octavia Camps. “Inferring Relational Potentials in Interacting Systems” *International Conference on Machine Learning (ICML)*, 2023.
- C44** Jiahui Fu, Yilun Du, Kurran Singh, Joshua B. Tenenbaum, John J. Leonard. “NeuSE: Neural SE(3)-Equivariant Embedding for Consistent Spatial Understanding with Objects” *Robotics Science and Systems (RSS)*, 2023.
- C43** Weiyu Liu, Yilun Du, Tucker Hermans, Sonia Chernova, Chris Paxton. “StructDiffusion: Language-Guided Creation of Physically-Valid Structures using Unseen Objects” *Robotics Science and Systems (RSS)*, 2023.
- C42** Cheng Chi, Siyuan Feng, Yilun Du, Zhenjia Xu, Eric Cousineau, Benjamin Burchfiel, Shuran Song. “Diffusion Policy: Visuomotor Policy Learning via Action Diffusion” *Robotics Science and Systems (RSS)*, 2023.
- C41** Yilun Du, Cameron Smith, Ayush Tewari, Vincent Sitzmann. “Learning to Render Novel Views from Wide-Baseline Stereo Pairs” *Computer Vision and Pattern Recognition (CVPR)*, 2023.

- C40** Yining Hong, Chunru Lin, Yilun Du, Zhenfang Chen, Joshua B. Tenenbaum, Chuang Gan. “3D Concept Learning and Reasoning from Multi-View Images” *Computer Vision and Pattern Recognition (CVPR)*, 2023.
- C39** Anurag Ajay\*, Yilun Du\*, Ahbi Gupta\*, Joshua B. Tenenbaum, Tommi S. Jaakkola, Pulkit Agrawal. “Is Conditional Generative Modeling all You Need for Decision-Making?”. *International Conference on Learning Representations (ICLR)*, 2023.
- C38** Shuang Li\*, Yilun Du\*, Joshua B. Tenenbaum, Antonio Torralba, Igor Mordatch. “Composing Ensembles of Pre-trained Models via Iterative Consensus”. *International Conference on Learning Representations (ICLR)*, 2023.
- C37** Hongyi Chen\*, Yilun Du\*, Yiye Chen\*, Joshua B. Tenenbaum, Patricio Antonio Vela. “Planning with Sequence Models through Iterative Energy Minimization” *International Conference on Learning Representations (ICLR)*, 2023.
- C36** Prafull Sharma, Ayush Tewari, Yilun Du, Sergey Zakharov, Rares Ambrus, Adrien Gaidon, William T. Freeman, Fredo Durand, Joshua B. Tenenbaum, Vincent Sitzmann. “Seeing 3D Objects in a Single Image via Self-Supervised Static-Dynamic Disentanglement”. *International Conference on Learning Representations (ICLR)*, 2023.
- C35** Ethan Chun, Yilun Du, Anthony Simeonov, Tomas Lozano-Perez, Leslie Kaelbling. “Local Neural Descriptor Fields: Locally Conditioned Object Representations for Manipulation”. *International Conference on Robotics Automation (ICRA)*, 2023.
- C34** Jose Iturralde\*, Aiden Curtis\*, Yilun Du, Leslie Kaelbling, Tomas Lozano-Perez. “Visibility-Aware Navigation Among Movable Objects”. *International Conference on Robotics Automation (ICRA)*, 2023.
- C33** Anthony Simeonov\*, Yilun Du\*, Yen-Chen Lin, Alberto Rodriguez, Leslie Kaelbling, Tomas Lozano-Perez, Pulkit Agrawal. “SE(3)-Equivariant Relational Rearrangement with Neural Descriptor Fields” *Conference on Robot Learning (CoRL)*, 2022.
- C32** Yen-Chen Lin, Pete Florence, Andy Zheng, Johnathon T. Barron, Yilun Du, Wei-Chiu Ma, Anthony Simeonov, Alberto Rodriguez, Phillip Isola. “MIRA: Mental Imagery for Robotic Affordances” *Conference on Robot Learning (CoRL)*, 2022.
- C31** Andrew Luo, Yilun Du, Michael J. Tarr, Joshua B. Tenenbaum, Antonio Torralba, Chuang Gan. “Learning Neural Acoustic Fields” *Neural Information Processing Systems (NeurIPS)*, 2022.
- C30** Yining Hong, Yilun Du, Chunru Lin, Joshua B. Tenenbaum, Chuang Gan. “3D Concept Grounding on Neural Fields” *Neural Information Processing Systems (NeurIPS)*, 2022.
- C29** Shuang Li, Xavier Puig, Chris Paxton, Yilun Du, Clinton Wang, Linxi Fan, Tao Chen, De-An Huang, Ekin Akyurek, Anima Anandkumar, Jacob Andreas, Igor Mordatch, Antonio Torralba, Yuke Zhu. “Pre-Trained Language Models for Interactive Decision-Making” *Neural Information Processing Systems (NeurIPS)*, 2022.
- C28** Nan Liu\*, Shuang Li\*, Yilun Du\*, Antonio Torralba, Joshua B. Tenenbaum. “Compositional Visual Generation with Composable Diffusion Models” *European Computer Conference in Vision (ECCV)*, 2022.
- C27** Yilun Du, Tomas Lozano-Perez, Leslie Kaelbling. “Learning Object Based State Estimators for Household Autonomy” *International Conference on Intelligent Robots and Systems (IROS)*, 2022.
- C26** Jiahui Fu, Yilun Du, Kurran Singh, Joshua B. Tenenbaum, John J. Leonard. “Robust Change Detection Based on Neural Descriptor Fields” *International Conference on Intelligent Robots and Systems (IROS)*, 2022.

- C25** Michael Janner\*, Yilun Du\*, Joshua B. Tenenbaum, Sergey Levine. “Planning with Diffusion for Flexible Behavior Synthesis” *International Conference on Machine Learning (ICML)*, 2022.
- C24** Yilun Du, Shuang Li, Joshua B. Tenenbaum, Igor Mordatch. “Learning Iterative Reasoning through Energy Minimization” *International Conference on Machine Learning (ICML)*, 2022.
- C23** Rylan Schaeffer, Yilun Du, Gabrielle Liu, Ila Fiete. “Streaming Inference for Infinite Feature Models” *International Conference on Machine Learning (ICML)*, 2022.
- C22** Shuang Li, Yilun Du, Guido M. van de Ven, Antonio Torralba, Igor Mordatch. “Energy-Based Models for Continual Learning” *Conference on Lifelong Learning Agents (CoLLA)*, 2022.
- C21** Rylan Schaeffer, Gabrielle Liu, Yilun Du, Scott Linderman, Ila Fiete. “Streaming Inference for Infinite Non-Stationary Clustering” *Conference on Lifelong Learning Agents (CoLLA)*, 2022.
- C20** Klaus Greff, Francois Belleetti, Lucas Beyer, Carl Doersch, Yilun Du, Daniel Duckworth, David J. Fleet, Dan Gnanapragasam, Florian Golemo, Charles Herrmann, Thomas Kipf, Abhijit Kundu, Dmitry Lagun, Issam Laradji, Derek Liu, Hanning Meyer, Yishu Miao, Derek Nowrouzezahrai, Cengiz Oztireli, Etienne Pot, Noha Radwan, Daniel Rebain, Sara Sabour, Mehdi Sajjadi, Matan Sela, Vincent Sitzmann, Austin Stone, Deqing Sun, Suhani Vora, Ziyu Wang, Tianhao Wu, Kwang Moo Yi, Fangcheng Zhong, Andrea Tagliasacchi. “Kubric: A Scalable Dataset Generator” *Computer Vision and Pattern Recognition (CVPR)*, 2022.
- C19** Anthony Simeonov\*, Yilun Du\*, Andrea Tagliasacchi, Joshua B. Tenenbaum, Alberto Rodriguez, Pulkit Agrawal, Vincent Sitzmann. “Neural Descriptor Fields: SE(3)-Equivariant Object Representations for Manipulation”. *International Conference on Robotics Automation (ICRA)*, 2022.
- C18** Yilun Du, Shuang Li, Yash Sharma, Joshua B. Tenenbaum, Igor Mordatch. “Unsupervised Learning of Compositional Energy Concepts” *Neural Information Processing Systems (NeurIPS)*, 2021.
- C17** Nan Liu\*, Shuang Li\*, Yilun Du\*, Joshua B. Tenenbaum, Antonio Torralba. “Learning to Compose Visual Relations” *Neural Information Processing Systems (NeurIPS)*, 2021.
- C16** Yilun Du, Katie Collins, Joshua B. Tenenbaum, Vincent Sitzmann. “Learning Signal-Agnostic Manifolds of Neural Fields” *Neural Information Processing Systems (NeurIPS)*, 2021.
- C15** Joseph Suarez, Yilun Du, Clare Zhu, Igor Mordatch, Phillip Isola. “The Neural MMO Platform for Massively Multiagent Research” *Neural Information Processing Systems Track on Datasets and Benchmarks (NeurIPS)*, 2021.
- C14** Yilun Du, Chuang Gan, Phillip Isola. “3D Shape Generation and Completion through Point-Voxel Diffusion” *International Conference on Computer Vision (ICCV)*, 2021.
- C13** Yilun Du, Yinan Zhang, Hong-Xing Yu, Joshua B. Tenenbaum, Jiajun Wu. “Neural Radiance Flow for 4D View Synthesis and Video Processing” *International Conference on Computer Vision (ICCV)*, 2021.
- C12** Linqi Zhou, Yilun Du, Jiajun Wu. “Curious Representation Learning for Embodied Intelligence” *International Conference on Computer Vision (ICCV)*, 2021.
- C11** Shuang Li, Yilun Du, Antonio Torralba, Josef Sivic, Bryan Russell. “Weakly Supervised Human-Object Interaction Detection in Video via Contrastive Spatiotemporal Regions” *International Conference on Computer Vision (ICCV)*, 2021.
- C10** Yilun Du, Shuang Li, Joshua B. Tenenbaum, Igor Mordatch. “Improved Contrastive Divergence Training of Energy Based Models” *International Conference on Machine Learning (ICML)*, 2021.
- C9** Yilun Du, Kevin Smith, Tomer Ullman, Joshua B. Tenenbaum, Jiajun Wu. “Unsupervised Discovery of 3D Physical Objects from Video” *International Conference on Learning Representations (ICLR)*, 2021.

- C8** Yilun Du, Shuang Li, Igor Mordatch. “Compositional Visual Generation with Energy Based Models” *Neural Information Processing Systems (NeurIPS)*, 2020.
- C7** Anthony Simeonov, Yilun Du, Beomjoon Kim, Francois Hogan, Joshua B. Tenenbaum, Pulkit Agrawal, Alberto Rodriguez. “A Long Horizon Planning Framework for Manipulating Rigid Pointcloud Objects” *Conference on Robot Learning (CoRL)*, 2020.
- C6** Yilun Du, Joshua Meier, Jerry Ma, Rob Fergus, Alexander Rives. “Energy-based models for atomic-resolution protein conformations”. *International Conference on Learning Representations (ICLR)*, 2020.
- C5** Xingyou Song, Yiding Jiang, Yilun Du, Behnam Neyshabur. “Observational Overfitting in Reinforcement Learning”. *International Conference on Learning Representations (ICLR)*, 2020.
- C4** Yilun Du, Toru Lin, Igor Mordatch. “Model Based Planning with Energy Based Models” *Conference on Robot Learning (CoRL)*, 2019.
- C3** Yilun Du, Igor Mordatch. “Implicit Generation and Generalization with Energy Based Models” *Neural Information Processing Systems (NeurIPS)*, 2019.
- C2** Yilun Du, Karthik Narasimhan. “Task-Agnostic Dynamics Priors for Deep Reinforcement Learning” *International Conference on Machine Learning (ICML)*, 2019.
- C1** Yilun Du, Zhijian Liu, Hector Basevi, Ales Leonardis, William T. Freeman, Joshua B. Tenenbaum, Jiajun Wu. “Learning to Exploit Stability for 3D Scene Parsing” *Neural Information Processing Systems (NeurIPS)*, 2018.

## Preprints

- P1** Robert Verkuil\*, Ori Kabeli\*, Yilun Du, Basile Wicky, Lukas Milles, Justas Dauparas, David Baker, Sergey Ovchinnikov, Tom Sercu, Alexander Rives. “Language Models Generalize Beyond Natural Proteins” bioRxiv 2023

## Teaching

### Experience

<b>6.867 Machine Learning</b> (Graduate) Teaching Assistant, Massachusetts Institute of Technology	Fall 2021
<b>6.036/6.862 Machine Learning</b> (Undergraduate/Graduate) Teaching Assistant, Massachusetts Institute of Technology	Spring 2018
<b>6.036 Machine Learning</b> (Undergraduate) Teaching Assistant, Massachusetts Institute of Technology	Fall 2017

## Invited Talks

<b>ICML Workshop on Multimodal Foundation Models in Embodied AI</b> Compositional Foundation Models, July 2024	
<b>RSS Workshop on Semantic Reasoning and Goal Understanding in Robotics</b> Panelist, July 2024	

### **RSS Workshop on GenAI and HRI**

Build Customizable Generative Models through Compositional Generation, July 2024

### **Generalizing Outside the Training Distribution through Composition Generation**

Vanderbilt Machine Learning, September 2024

NUS Tea Time, July 2024

CMU MLD, April 2024

UMich CSE, April 2024

UT Austin, April 2024

UBC, April 2024

UT Austin, April 2024

Princeton, April 2024

Brown, April 2024

NYU, March 2024

Columbia, March 2024

UPenn, March 2024

University of Washington, March 2024

Georgia Tech, March 2024

University of Toronto, March 2024

Harvard, March 2024

UCSD, Feb 2024

Boston Dynamics AI Institute, Feb 2024

ASU Frontiers in GenAI Seminar, Jan 2024

Genesis Therapeutics, Jan 2024

JHU, Nov 2023

KAIST, Nov 2023

CMU, AI Seminar, Nov 2023

Brown University, Robotics Seminar, Oct 2023

Cornell University, Robotics Seminar, Oct 2023

UC Berkeley, Oct 2023

UT Austin, Oct 2023

Stanford, Vision Seminar, July 2023

### **NeurIPS Tutorial on Language Models Meet World Models**

Panelist, Dec 2023

### **Learning a Visual Imagination**

BuzzRobot, Dec 2023

### **Towards Multi-AI Intelligent Systems**

University of Tokyo, IRCN Keynote Speech, Oct 2023

### **Eye on AI Podcast**

AI Self-Improvement from Multiagent Debate, Oct 2023

### **Riding the Wave of Generative Modeling for Decision Making**

University of Montreal, Robot Learning Seminar, Oct 2023

### **Planning with Diffusion Models**

Donders Institute, Feb 2023

Deepmind, Aug 2022



## Implicit Learning with Energy Based Models

Nuro, October 2022

Tencent, September 2022

CMU, August 2022

## Generally Intelligent Podcast

Modularity and Energy Based Models, Nov 2021

## Mentoring

### Research Mentoring

#### Undergraduates and Master Students

Katherine Lin

Zhengyang Liang

Yunhao Luo

*Potential Based Diffusion Motion Planning*

Pochen Ko

*Learning to Act from Actionless Videos through Dense Correspondences*

Bharat Runwal

*A Benchmark for Learning to Continually Generate*

Alpner Canberk

Jocelin Su

*Compositional Image Decomposition with Diffusion Models*

Zachery Akner

Megan Wei - Now PhD Student at Brown

Ethan Chun

*Local Neural Descriptor Fields: Locally Conditioned Object Representations for Manipulation*

Hongyi Chen - Now PhD Student at CMU

*Planning with Sequence Models through Iterative Energy Minimization*

Qingquan Bao - Now Master Student at UPenn

*Embodied Depth Prediction*

Nan Liu - Now Research Engineer at Google

*Learning to Compose Visual Relations*

*Compositional Visual Generation with Composable Diffusion Models*

*Unsupervised Compositional Concepts Discovery with Text-to-Image Generative Models*

Jose Itturalde

*Visibility-Aware Navigation Among Movable Objects*

Vabhihav Singh

*Wake-Sleep Energy Based Models for Continual Learning*

Yihong Sun - Now PhD Student at Cornell

Alex Zhou - Now PhD Student at Stanford

*3D Shape Generation and Completion through Point-Voxel Diffusion*

2023-

2023-

2023-

ICML 2024

2023-

ICLR 2024

2022-

In Submission

2023

2022-2023

ICML 2024

2022-2023

2022-2023

2022-2023

ICRA 2023

2022-2023

ICLR 2023

2022-2023

In Submission

2021-2023

NeurIPS 2021

ECCV 2022

ICCV 2023

2022

ICRA 2023

2022

In Submission

2021-2022

2020-2021

ICCV 2021

#### PhD Students

Yichen Li

*Learning to Jointly Understand Visual and Tactile Signals*

Siyuan Zhou

*Adaptive Online Replanning with Diffusion Models*

Armand Comas

*Inferring Relational Potentials in Interacting Systems*

2022-2023

ICLR 2024

2022-

NeurIPS 2023

2021-

ICML 2023

## Professional Service

### Conference Refereeing

Neural Information Processing Systems (NeurIPS)	2021-23
International Conference in Machine Learning (ICML)	2021-23
International Conference in Learning Representations (ICLR)	2021-24
Computer Vision and Pattern Recognition (CVPR)	2021-23
International Conference in Computer Vision (ICCV)	2021,23
European Conference in Computer Vision (ECCV)	2022
Special Interest Group in Graphics (SIGGRAPH)	2022-24
SIGGRAPH Asia	2024
Conference on Robot Learning (CoRL)	2023-24
Robotics: Science and Systems (RSS)	2023
International Conference on Robotics and Automation (ICRA)	2022-23
International Conference on Intelligent Robots and Systems (IROS)	2022-23

### Workshop Organization

Workshop on Compositional Learning at NeurIPS 2024	Dec 2024
Workshop on Safe Generative AI at NeurIPS 2024	Dec 2024
Workshop on Geometric and Algebraic Structure in Robot Learning at RSS 2024	July 2024
Generative Models for Decision Making Workshop at ICLR 2023	May 2024
Foundation Models for Decision Making Workshop at NeurIPS 2023	Dec 2023
Foundation Models for Decision Making Workshop at NeurIPS 2022	Dec 2022

### Seminar Organization

MIT Embodied Intelligence Seminar	2021-2023
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