# Anurag Ajay

aajay@mit.edu |anuragajay.github.io

## Education

**Massachusetts Institute of Technology** September 2019 - Present
Ph.D. in Electrical Engineering and Computer Science GPA: 5.00/5.00
**MIT Presidential fellowship**

**Massachusetts Institute of Technology** September 2017 - September 2019
S.M. in Electrical Engineering and Computer Science GPA: 5.00/5.00
**MIT Presidential fellowship**

**University of California, Berkeley** August 2013 - May 2017
B.S. in Electrical Engineering and Computer Science GPA: 3.95/4.00
**Graduated with Highest Honors (top 3%)**

## Experience

**Improbable AI Lab** September 2019 - Present
(Adviser: Pulkit Agarwal)

- Flexibly composing foundation models, each pretrained on different modality of internet data, for decision-making in embodied agents
- Building deep RL algorithms that leverages past offline interactions for faster online learning

**Meta FAIR Research Internship** June 2023 - Present
(Advisers: Aravind Rajeswaran)

- Curated an evaluation dataset for Embodied Question Answering consisting of high-quality human generated questions representative of real-world use cases for Embodied AI agents
- Worked on leveraging Vision-Langauge-Models and composing them with other foundation models for Embodied Question Answering.

**Google Brain Research Internship** June 2020 - August 2020
(Advisers: Ofir Nachum and Sergey Levine)

- Worked on leveraging (unlabelled) offline data to extract skills which allows for improved offline reinforcement learning, online reinforcement learning and few-shot imitation learning.

**Learning and Intelligent Systems Group** September 2017 - September 2019
(Advisers: Leslie Kaelbling and Josh Tenenbaum)

- Worked on leveraging physics engine for dynamics model learning and control
- Worked on curiosity driven exploration for reinforcement learning in environment with sparse rewards

**Madry Lab** (with Aleksander Madry) March 2019 - September 2019

- Worked on robust style transfer for images and videos

**Berkeley Artificial Intelligence Research Lab** October 2014 - May 2017
(Advisers: Pieter Abbeel and Sergey Levine)

- Worked on deep learning for state estimation
- Developed model-based sample efficient reinforcement learning algorithm

## Publications

**Compositional Foundation Models for Hierarchical Planning**
**Anurag Ajay***, Seungwook Han*, Yilun Du*, Shuang Li, Abhi Gupta, Tommi Jaakkola, Joshua B. Tenenbaum, Leslie Kaelbling, Akash Srivastava, Pulkit Agrawal.
Neural Information Processing Systems (NeurIPS), New Orleans, USA, December 2023.

**Statistical Learning under Heterogenous Distribution Shift**
Max Simchowitz*, **Anurag Ajay***, Pulkit Agrawal, Akshay Krishnamurthy.
International Conference on Machine Learning (ICML), Hawaii, USA, July 2023.

**Parallel-Q-Learning: Scaling Off-policy Reinforcement Learning**
Zechu Li, Tao Chen, Zhang-Wei Hong, **Anurag Ajay**, Pulkit Agrawal.
International Conference on Machine Learning (ICML), Hawaii, USA, July 2023.

**Is Conditional Generative Modeling all you need for Decision Making?**
**Anurag Ajay***, Yilun Du*, Abhi Gupta*, Josh Tenenbaum, Tommi Jaakkola, Pulkit Agrawal.
International Conference on Learning Representations (ICLR), Kigali, Rwanda, May 2023.
**Oral Talk**

**Distributionally Adaptive Meta Reinforcement Learning**
**Anurag Ajay***, Abhishek Gupta*, Dibya Ghosh, Sergey Levine, Pulkit Agrawal.
Neural Information Processing Systems (NeurIPS), New Orleans, USA, December 2022.

**Offline RL Policies should be trained to be Adaptive**
Dibya Ghosh, **Anurag Ajay**, Pulkit Agrawal, Sergey Levine.
International Conference on Machine Learning (ICML), Baltimore, USA, July 2022.
**Oral Talk**

**Overcoming The Spectral Bias of Neural Value Approximation**
Ge Yang*, **Anurag Ajay***, Pulkit Agrawal.
International Conference on Learning Representations (ICLR), Virtual, May 2022.

**Understanding the Generalization Gap in Visual Reinforcement Learning**
**Anurag Ajay***, Ge Yang*, Ofir Nachum, Pulkit Agrawal.
ICML Reinforcement Learning for Real Life Workshop, July 2021.

**OPAL: Offline Primitive Discovery for Accelerating Offline Reinforcement Learning**
**Anurag Ajay**, Aviral Kumar, Pulkit Agrawal, Sergey Levine, Ofir Nachum.
International Conference on Learning Representations (ICLR), Vienna, Austria, May 2021.

**Learning Action Priors for Visuomotor transfer**
**Anurag Ajay**, Pulkit Agrawal.
ICML Inductive biases, invariances and generalization in RL workshop, July 2020.

**Long-Horizon Prediction and Uncertainty Propagation with Residual Point Contact Learners**
Nima Fazeli, **Anurag Ajay**, Alberto Rodriguez.
IEEE International Conference on Robotics and Automation (ICRA), Paris, France, May 2020.

**Learning Skill Hierarchies from Predicate Descriptions and Self-Supervision**
Tom Silver*, Rohan Chitnis*, **Anurag Ajay**, Josh Tenenbaum, Leslie Pack Kaelbling.
AAAI Workshop on Generalization in Planning (GenPlan), 2020.

**Learning to Navigate Endoscopic Capsule Robots**
Mehmet Turan, Yasin Almalioglu, Hunter B Gilbert, Faisal Mahmood, Nicholas J Durr, Helder Araujo, Alp Eren Sar,**Anurag Ajay**, Metin Sitti.
Robotics and Automation Letters (RA-L), 2019.

**Combining Physical Simulators and Object-Based Networks for Control**
**Anurag Ajay**, Maria Bauza, Jiajun Wu, Nima Fazeli, Joshua B. Tenenbaum, Alberto Rodriguez, Leslie P. Kaelbling.
IEEE International Conference on Robotics and Automation (ICRA), Montreal, Canada, May 2019.

**Augmenting Physical Simulators with Stochastic Neural Networks: Case Study of Planar Pushing and Bouncing**
**Anurag Ajay**, Jiajun Wu, Nima Fazeli, Maria Bauza, Leslie P. Kaelbling, Joshua B. Tenenbaum, Alberto Rodriguez.
IEEE International Conference on Intelligent Robots and Systems (IROS), Madrid, Spain, October 2018.
**Best Paper for Cognitive Robotics**

**Reset-Free Guided Policy Search: Efficient Deep Reinforcement Learning with Stochastic Initial States**
**Anurag Ajay***, William Montgomery*, Chelsea Finn, Pieter Abbeel, Sergey Levine. IEEE International Conference on Robotics and Automation (ICRA), Singapore, May 2017.

**Backprop KF: Learning Discriminative Deterministic State Estimators**
Tuomas Haarnoja, **Anurag Ajay**, Sergey Levine, Pieter Abbeel.
Neural Information Processing Systems (NIPS), Barcelona, Spain, December 2016.