

# Rohan Chitnis

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## Education

**Massachusetts Institute of Technology**, Cambridge, MA

**GPA: 4.8 / 5.0.** Minor: Econometrics.

Doctor of Philosophy in Electrical Engineering and Computer Science, May 2022 (expected).

Master of Science in Electrical Engineering and Computer Science, May 2018.

*Relevant Coursework:* Advanced Algorithms, Randomized Algorithms, Advanced Natural Language Processing, Econometrics, Time Series Analysis.

**University of California, Berkeley**, Berkeley, CA

**Graduated with Highest Honors (GPA in top 3%). GPA: 3.95 / 4.0.**

Bachelor of Science in Electrical Engineering and Computer Sciences, May 2016.

*Relevant Coursework:* Advanced Robotics, Machine Learning, Deep Reinforcement Learning, Artificial Intelligence, Computer Vision, Optimization, Graphics, Computational Geometry, Image Processing, Probability and Random Processes, Algorithms, Data Structures.

## Research Experience

**MIT Learning & Intelligent Sys. Lab** (Adviser: Leslie Kaelbling) 09/16 - Present

- Conduct research in artificial intelligence for robotics, toward a PhD.
- Focus on integrated learning and planning for solving long-horizon robotic tasks.

**Facebook AI Research, Robotics** (Research Intern with Abhinav Gupta) 06/19 - 09/19

- Researched formulations of intrinsic motivation for emergence of synergistic behavior in robotics via deep reinforcement learning.
- Built and tested my algorithms in bimanual manipulation environments, both in simulation and on real Sawyer robot arms.

**Google Brain, Robotics** (Research Intern with Sergey Levine) 05/17 - 09/17

- Researched methods for speeding up deep reinforcement learning for robotics, by regressing on event outcomes to improve exploration.
- Designed and implemented a stand-alone framework for learning-based manipulation.

**UC Berkeley Robot Learning Lab** (Adviser: Pieter Abbeel) 02/13 - 05/16

- Performed work in hierarchical combined task and motion planning for execution of long-horizon robotic tasks such as laundry.
- Integrated reinforcement learning to improve existing approaches.
- Lead coordinator of lab outreach program, providing tours to visitors of varied ages.

**UC Berkeley Oscii Lab** (Adviser: John DeNero) 04/15 - 05/16

- Conducted research in Natural Language Processing.
- Improved performance of neural machine translation using Huffman code compression.

## Journal Publications

**Integrated Task and Motion Planning**

Caelan Reed Garrett, **Rohan Chitnis**, Rachel Holladay, Beomjoon Kim, Tom Silver, Leslie Pack Kaelbling, Tomás Lozano-Pérez.

Annual Review of Control, Robotics, and Autonomous Systems, Volume 4, 2021.

## Conference Publications

**Towards Optimal Correlational Object Search**

Kaiyu Zheng, **Rohan Chitnis**, Yoonchang Sung, George Konidaris, Stefanie Tellex.

IEEE International Conference on Robotics and Automation (ICRA), 2022.

**Learning Symbolic Operators for Task and Motion Planning**

Tom Silver\*, **Rohan Chitnis\***, Joshua Tenenbaum, Leslie Pack Kaelbling, Tomás Lozano-Pérez.

IEEE/RSJ International Conference on Intelligent Robots and Systems (IROS), 2021.

**GLIB: Efficient Exploration for Relational Model-Based Reinforcement Learning via Goal-Literal Babbling**

**Rohan Chitnis\***, Tom Silver\*, Joshua Tenenbaum, Leslie Pack Kaelbling, Tomás Lozano-Pérez.  
AAAI Conference on Artificial Intelligence (AAAI), 2021.

**Planning with Learned Object Importance in Large Problem Instances using Graph Neural Networks**

Tom Silver\*, **Rohan Chitnis\***, Aidan Curtis, Joshua Tenenbaum, Tomás Lozano-Pérez, Leslie Pack Kaelbling.  
AAAI Conference on Artificial Intelligence (AAAI), 2021.

**CAMPs: Learning Context-Specific Abstractions for Efficient Planning in Factored MDPs**

**Rohan Chitnis\***, Tom Silver\*, Beomjoon Kim, Leslie Pack Kaelbling, Tomás Lozano-Pérez.  
Conference on Robot Learning (CoRL), 2020.

**Efficient Bimanual Manipulation Using Learned Task Schemas**

**Rohan Chitnis**, Shubham Tulsiani, Saurabh Gupta, Abhinav Gupta.  
IEEE International Conference on Robotics and Automation (ICRA), 2020.

**Intrinsic Motivation for Encouraging Synergistic Behavior**

**Rohan Chitnis**, Shubham Tulsiani, Saurabh Gupta, Abhinav Gupta.  
International Conference on Learning Representations (ICLR), 2020.

**Learning Compact Models for Planning with Exogenous Processes**

**Rohan Chitnis**, Tomás Lozano-Pérez.  
Conference on Robot Learning (CoRL), 2019.

**Learning Quickly to Plan Quickly Using Modular Meta-Learning**

**Rohan Chitnis**, Leslie Pack Kaelbling, Tomás Lozano-Pérez.  
IEEE International Conference on Robotics and Automation (ICRA), 2019.

**Learning What Information to Give in Partially Observed Domains**

**Rohan Chitnis**, Leslie Pack Kaelbling, Tomás Lozano-Pérez.  
Conference on Robot Learning (CoRL), 2018.

**Integrating Human-Provided Information Into Belief State Representation Using Dynamic Factorization**

**Rohan Chitnis**, Leslie Pack Kaelbling, Tomás Lozano-Pérez.  
IEEE/RSJ International Conference on Intelligent Robots and Systems (IROS), 2018.

**Finding Frequent Entities in Continuous Data**

Ferran Alet, **Rohan Chitnis**, Leslie Pack Kaelbling, Tomás Lozano-Pérez.  
International Joint Conference on Artificial Intelligence (IJCAI), 2018.

**Sequential Quadratic Programming for Task Plan Optimization**

Dylan Hadfield-Menell, Christopher Lin, **Rohan Chitnis**, Stuart Russell, Pieter Abbeel.  
IEEE/RSJ International Conference on Intelligent Robots and Systems (IROS), 2016.

**Guided Search for Task and Motion Plans Using Learned Heuristics**

**Rohan Chitnis**, Dylan Hadfield-Menell, Abhishek Gupta, Siddharth Srivastava, Edward Groshev, Christopher Lin, Pieter Abbeel.  
IEEE International Conference on Robotics and Automation (ICRA), 2016.

**Variable-Length Word Encodings for Neural Translation Models**

**Rohan Chitnis**, John DeNero.  
Conference on Empirical Methods in Natural Language Processing (EMNLP), 2015.

**Modular Task and Motion Planning in Belief Space**

Dylan Hadfield-Menell, Edward Groshev, **Rohan Chitnis**, Pieter Abbeel.  
IEEE/RSJ International Conference on Intelligent Robots and Systems (IROS), 2015.

**Combined Task and Motion Planning Through an Extensible Planner-Independent Interface Layer**

Siddharth Srivastava, Eugene Fang, Lorenzo Riano, **Rohan Chitnis**, Stuart Russell, Pieter Abbeel.

IEEE International Conference on Robotics and Automation (ICRA), 2014.

**Honors /  
Awards**

**Facebook Fellowship Finalist, 2020.** Top 4% of applicants for the Facebook Fellowship, Machine Learning track.

**NSF GRFP Fellow, 2016. Awarded NDSEG Fellowship (declined).**

**Hertz Fellowship Finalist, 2016.** One of 40 finalists for the Hertz Fellowship, a highly reputable fellowship for student researchers in the physical, biological, and engineering sciences.

**Runner-up for the Computing Research Association (CRA) Outstanding Undergraduate Researcher Award (Male, PhD-granting institution), 2016.** Highly prestigious award recognizing North American undergraduate students who show outstanding research potential in a field of computing.

**Sole recipient of the EECS Mark D. Weiser Excellence in Computing Scholarship, 2015.** Merit-based scholarship awarded to one student in the Berkeley EECS department each year for excellence in research.

**Member of the EECS Honors Degree Program, concentration in Mathematics.** Honors program with 20-30 students. Requirements include research and extended studies in concentration outside EECS.

**UC Berkeley Outstanding Graduate Student Instructor (OGSI) Award recipient, 2015.** Awarded to top 10% of Teaching Assistants across the university each year.

**UC Berkeley Regents' and Chancellor's Scholar.** Merit-based scholarship awarded to top 1.5% of applicants to UC Berkeley each year.

**National Merit Scholar.** Merit-based scholarship awarded to high-achieving high school students for partial college tuition payment.

**Teaching  
Assistantships**

**CS106A: Code In Place.** *Stanford, free online course during COVID-19.* Summer 2020.

**6.036: Introduction to Machine Learning.** *MIT.* Fall 2018.

**CS189: Introduction to Machine Learning.** *UC Berkeley.* Spring 2016.

**CS188: Introduction to Artificial Intelligence.** *UC Berkeley.* Fall 2015.

**CS61A: Structure and Interpretation of Computer Programs.** *UC Berkeley.* Spring 2015, Spring 2014, Summer 2013.

**CS61C: Great Ideas in Computer Architecture.** *UC Berkeley.* Fall 2014.

**Industry**

**Nuro Inc., Planning** (Software Engineering Intern) 06/21 - 09/21

- Explored integrated data-driven and rule-based reasoning to improve planning stack.
- Developed a synergistic approach that improves behavior in 20-40% of challenge scenes.

**Airbnb Inc., Search Ranking** (Software Engineering Intern) 06/16 - 08/16

- Worked on incorporating mobile data into machine learning models used by the Search Ranking team. Collected and organized data using tools in Hive, Presto, and Scala.

**eBay Inc., Checkout** (Software Engineering Intern) 05/14 - 08/14

- Developed an end-to-end pipeline to create a model that classifies checkout transactions.

- Collected data using Hadoop MapReduce under the Apache Pig framework.

**Technical  
Skills**

**Languages:** Python, C++, Java, Scala, LaTeX.

**Software:** PyTorch, TensorFlow, Theano, Unix/Linux, Robot Operating System (ROS), OpenCV, Apache Pig, Apache Spark, Hadoop MapReduce.