Beomjoon Kim

Contact Information
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Education
Ph.D. in Computer Science
Sept 2014 - May 2020 (Advisors: Leslie Pack Kaelbling and Tomás Lozano-Pérez)
Massachusetts Institute of Technology, EECS, Cambridge, USA

M.Sc. in Computer Science
Jan 2012 - Dec 2013 (Advisor: Joelle Pineau)
McGill University, School of Computer Science, Montreal, Canada

BMath. in Joint Honours of Computer Science and Statistics (with Distinction)
Sep 2007 - Dec 2011
University of Waterloo, Faculty of Mathematics, Waterloo, Canada

Journal Papers
Representation, learning, and planning algorithms for geometric task and
motion planning
Beomjoon Kim, Luke Shimamuki, Leslie P. Kaelbling, Tomás Lozano-Pérez.
International Journal of Robotics Research (IJRR), 2021.

Integrated task and motion planning
Caelan Reed Garrett, Rohan Chitnis, Rachel Holladay, Beomjoon Kim, Tom Silver,
Leslie P. Kaelbling, Tomás Lozano-Pérez.
Annual Review of Control, Robotics, and Autonomous Systems, 2021.

Learning to guide task and motion planning using score-space representa-
tion
Beomjoon Kim, Zi Wang, Leslie P. Kaelbling, Tomás Lozano-Pérez.
International Journal of Robotics Research (IJRR), 2019.

Socially adaptive path planning in dynamic environments using inverse re-
inforcement learning
Beomjoon Kim, Joelle Pineau.
International Journal of Social Robotics, 2015.

Conference Papers
Preference learning for guiding the tree search in continuous POMDPs
Jiyong Ahn, Sanghyeon Son, Dongryung Lee, Jisu Han, Dongwon Son., Beomjoon Kim.
Conference on Robot Learning (CoRL), 2023.

Pre- and post-contact policy decomposition for non-prehensile manipulation
with zero-shot sim-to-real transfer.
Minchan Kim, Junhyek Han, Jaehyung Kim, Beomjoon Kim.
International Conference on Intelligent Robots and Systems (IROS), 2023.

Local object crop collision network for efficient simulation of non-convex
objects in GPU-based simulators.
Dongwon Son, Beomjoon Kim.
Robotics: Science and Systems (RSS), 2023.

Ohm²: Optimal hierarchical planner for object search in large environments
via mobile manipulation
Yoonyoung Cho*, Donghoon Shin*, Beomjoon Kim.
International Conference on Intelligent Robots and Systems (IROS), 2022.

A long horizon planning framework for manipulating rigid pointcloud objects
Anthony Simeonov, Yilun Du, Beomjoon Kim, Francoi Hogan, Joshua Tenenbaum, Pulkit Agrawal, Alberto Rodriguez.
Conference on Robot Learning (CoRL), 2020.

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.
(Plenary talk 12% acceptance rate)

Monte Carlo Tree Search in continuous spaces using Voronoi optimistic optimization with regret bounds
Beomjoon Kim, Kyungjae Lee, Sungbin Lim, Leslie P. Kaelbling, Tomás Lozano-Pérez.
AAAI Conference on Artificial Intelligence (AAAI), 2020.
(20.6% acceptance rate. Selected for an oral presentation)

Learning value functions with relational state representations for guiding task-and-motion planning
Beomjoon Kim, Luke Shimamuki.
Conference on Robot Learning (CoRL), 2019.
(27.6% acceptance rate)

Adversarial actor-critic method for task and motion planning problems using planning experience
Beomjoon Kim, Leslie P. Kaelbling, Tomás Lozano-Pérez.
AAAI Conference on Artificial Intelligence (AAAI), 2019.
(16.2% acceptance rate. Selected for an oral presentation with 6% acceptance rate)

Regret bounds for meta Bayesian optimization with an unknown Gaussian process prior
Beomjoon Kim*, Zi Wang*, Leslie P. Kaelbling. (* indicates equal contribution)
Neural Information Processing Systems (NeurIPS), 2018.
(20.8% acceptance rate. Selected for a spotlight presentation with 3.5% acceptance rate)

Guiding search in continuous state-action spaces by learning an action sampler from off-target search experience
Beomjoon Kim, Leslie P. Kaelbling, Tomás Lozano-Pérez.
AAAI Conference on Artificial Intelligence (AAAI), 2018.
(24.6% acceptance rate. Selected for an oral presentation)

Learning to guide task and motion planning using score-space representation
Beomjoon Kim, Leslie P. Kaelbling, Tomás Lozano-Pérez.
IEEE International Conference on Robotics and Automation (ICRA), 2017.
(Winner of Best Cognitive Robotics Paper Award)

Generalizing over uncertain dynamics for online trajectory generation
Learning from limited demonstrations
Beomjoon Kim, Amir M. Farahmand, Joelle Pineau, Doina Precup.
Neural Information Processing Systems (NeurIPS), 2013.
(25.3% acceptance rate. Selected for a spotlight presentation with 4% acceptance rate)

Maximum mean discrepancy imitation learning
Beomjoon Kim, Joelle Pineau.
Robotics: Science and Systems (RSS), 2013.
(30% acceptance rate)

Research Experience
Research Assistant, Reasoning and Learning Lab, McGill University.
Montreal, QC. Jan 2012 - Dec 2013
Developed novel reinforcement and imitation learning methods and applied them
to the path planning for a robotic wheelchair. Advised by Joelle Pineau.

Research Assistant, Reasoning and Learning Lab, McGill University.
Montreal, QC. Jan 2011 - April 2011
Applied a POMDP solver to the user intention inference problem for a robotic
wheelchair. Advised by Joelle Pineau.

Research Assistant, Department of National Defence - Center for operational R&D.
Ottawa, ON. Sept 2008 - Dec 2008
Developed a novel genetic algorithm for an aircraft cargo-loading problem. Ad-
vised by Bohdan L. Kaluzny.

Teaching Experience
Teaching Assistant for 6.036 Intro to Machine Learning, MIT.
Boston, MA. Sept 2017 - Dec 2017
Helped design exams, weekly labs, and problem sets. Held office hours and an-
swered questions on the course on-line forum to help students with course mate-
rials.

Industry Experience
Machine Learning Engineer, Thalmic Labs.
Waterloo, ON. Jan 2014 - April 2014
Developed a gesture recognition algorithm for a gesture-controlled human-computer
interaction device.

Digital Signal Processing Algorithm Developer, ON Semiconductor.
Waterloo, ON. Jan 2010 - April 2010
Developed noise reduction and echo cancellation algorithms for cell phone chips.

Software Consultant, Engenuity Corporation.
Toronto, ON. May 2009 - Aug 2009
Developed diverse software for different customer enterprises. Web development
using JQuery and embedded system development for medical equipment.
Awards

- Google Research Scholar Award, 2023
- ICRA Best Cognitive Robotics Paper Award, 2017
- McGill GREAT Award, 2013
- NSERC Undergraduate Student Research Award, 2010
- University of Waterloo Full-time Bursary (merit-based), 2007-2011
- University of Waterloo President’s Scholarship, 2007