
EDUCATION

- 2020 **Ph.D in Computer Science**, *Brown University*, Providence, RI.
Advisor: Michael L. Littman.
Thesis: Effective Reinforcement Learning through State Abstraction.
- 2019 **M.A. in Philosophy**, *Brown University*, Providence, RI.
Advisor: Joshua Schechter.
Thesis: Concepts in Bounded Rationality: Perspectives from Reinforcement Learning.
- 2015 **M.S. in Computer Science**, *Brown University*, Providence, RI.
Advisor: Stefanie Tellex.
Thesis: Learning to Plan in Complex Stochastic Domains.
- 2013 **B.A. in Computer Science & Philosophy**, *Carleton College*, Northfield, MN.
Advisors: David Liben-Nowell (CS), Anna Moltchanova (Philosophy).
Thesis: Toward the Defense of Hypercomputation.

PUBLICATIONS

Conference Papers

The Expected Length Model of Options.

David Abel*, John Winder*, Marie DesJardins, Michael L. Littman
IJCAI 2019.

Finding Options that Minimize Planning Time.

Yuu Jinnai, David Abel, D. Ellis Hershkowitz, Michael L. Littman, George Konidaris.
ICML 2019.

Discovering Options for Exploration by Minimizing Cover Time.

Yuu Jinnai, Jee Won Park, David Abel, George Konidaris.
ICML 2019.

State Abstraction as Compression in Apprenticeship Learning.

David Abel, Dilip Arumugam, Kavosh Asadi, Yuu Jinnai, Michael L. Littman, Lawson L.S. Wong.
AAAI 2019.

Optimal planning to plan: People partially plan based on plan specificity.

Mark K. Ho, David Abel, Jonathan Cohen, Michael Littman, Thomas L. Griffiths.
CCN 2019.

State Abstractions for Lifelong Reinforcement Learning.

David Abel, Dilip Arumugam, Lucas Lehnert, Michael L. Littman.
ICML 2018.

Policy and Value Transfer in Lifelong Reinforcement Learning

David Abel*, Yuu Jinnai*, Yue Guo, George Konidaris, Michael L. Littman.
ICML 2018.

Bandit-Based Solar Panel Control.

David Abel, Edward C. Williams, Stephen Brawner, Michael L. Littman, Emily Reif.
IAAI 2018.

Near Optimal Behavior via Approximate State Abstraction.

David Abel*, D. Ellis Hershkowitz*, Michael L. Littman.
ICML 2016.

Goal-Based Action Priors.

David Abel, D. Ellis Hershkowitz, Gabriel Barth-Maron, Stephen Brawner, Kevin O'Farrell, James MacGlashan, Stefanie Tellex.
ICAPS 2015.

Journal Papers

The Value of Abstraction.

Mark K. Ho, David Abel, Thomas L. Griffiths, Michael L. Littman.
Current Opinions in Behavioral Sciences, 2019.

Workshops, Symposia, and Extended Abstracts

Value Preserving State-Action Abstractions.

David Abel, Nathan Umbanhowar, Khimya Khetarpal, Dilip Arumugam, Doina Precup, and Michael L. Littman.
ICLR Workshop on Structure and Priors in Reinforcement Learning, 2019.

Skill Discovery with Well-Defined Objectives.

Yuu Jinnai, David Abel, Jee Won Park, D. Ellis Hershkowitz, Michael L. Littman, and George Konidaris.
ICLR Workshop on Structure and Priors in Reinforcement Learning, 2019.

simple_rl: Reproducible Reinforcement Learning in Python.

David Abel.
ICLR Workshop on Reproducibility in Machine Learning, 2019.

Boundedly Rational Concept Formation.

David Abel, Mark K. Ho.
IACAP 2019.

A Theory of State Abstraction for Reinforcement Learning.

David Abel.
AAAI Doctoral Consortium 2019.

Toward Good Abstractions for Lifelong Learning.

David Abel, Dilip Arumugam, Lucas Lehnert, Michael L. Littman.
NeurIPS Workshop on Hierarchical Reinforcement Learning, 2017.

Toward Improving Solar Panel Efficiency using Reinforcement Learning.

David Abel, Emily Reif, Edward C. Williams, Michael L. Littman.
EnvironInfo 2017, early version at RLDM 2017.

Agent-Agnostic Human-in-the-Loop Reinforcement Learning.

David Abel, John Salvatier, Andreas Stuhlmüller, Owain Evans.

NeurIPS Workshop on the Future of Interactive Learning Machines, 2016.

Exploratory Gradient Boosting for Reinforcement Learning in Complex Domains.

David Abel, Alekh Agarwal, Fernando Diaz, Akshay Krishnamurthy, Robert Schapire.
ICML Workshop on Abstraction in Reinforcement Learning, 2016.

Reinforcement Learning as a Framework for Ethical Decision Making.

David Abel, James MacGlashan, Michael L. Littman.
AAAI Workshop on AI, Society, & Ethics, 2016.

Affordances as Transferrable Knowledge for Planning Agents.

Gabriel Barth-Maron, David Abel, James MacGlashan, Stefanie Tellex.
AAAI Symposium on Knowledge and Skill Transfer, 2014.

Toward Affordance-Aware Planning.

David Abel, Gabriel Barth-Maron, James MacGlashan, Stefanie Tellex.
RSS Workshop on Affordances in Vision for Cognitive Robotics, 2014.

TEACHING EXPERIENCE

- Primary Instructor **A First Byte of Computer Science**, 110 students, Brown University.
Instructor **Artificial Intelligence and Society**, 20 students, High School Summer at Brown.
- Guest Lecturer **Reinforcement Learning**, Brown University.
Lecturer **Data Science**, Brown University.
A First Byte of Computer Science, Brown University.
Data Science Summer Program, Microsoft Research NYC Summer School.
- Teaching Assistant **A First Byte of Computer Science**, Brown University.
Artificial Intelligence, Brown University.
Data Structures, Carleton College.
Logic, Carleton College.
Intro to Computer Science ×3, Carleton College.
- Volunteer Work **Hour of Code**, Nathan Bishop Middle School.
Math Tutor, OES Elementary School.
Chess Coach, Vose Elementary School.

PROFESSIONAL EXPERIENCE

- Summer 2019 **Research Intern**, *DeepMind London*, Mentored by Dr. Will Dabney.
Summer 2016 **Visiting Researcher**, *University of Oxford*, Mentored by Dr. Owain Evans.
Summer 2015 **Research Intern**, *Microsoft Research NYC*, Mentored by Dr. Fernando Diaz.

INVITED TALKS

- 2019 *Abstraction and Meta-Learning*, NeurIPS Workshop on Meta-Learning.

- State Abstraction in Reinforcement Learning*, U. Mass. Amherst, UT Austin, Oxford
- 2018 *State Abstraction in Reinforcement Learning*, UCLA, USC, UCSD, CU Boulder, Princeton, Oregon State, Baidu Sunnyvale.
Bandit-Based Solar Panel Control, Computational Sustainability Seminar
- 2017 *How Artificial Intelligence Should Model the World*, Research Matters.
Abstraction and Lifelong Reinforcement Learning, Carnegie Mellon University
Artificial Intelligence; How Intelligent, and How Soon?, Nordea Markets NYC
Abstraction and Reinforcement Learning, Microsoft Research, Redmond

AWARDS

- Brown University **Presidential Award for Excellence in Teaching.**
Open Graduate Fellowship for Masters in Philosophy.
Great Teaching Assistant Award, *Artificial Intelligence.*
Great Teaching Assistant Award, *A First Byte of Computer Science.*
- Carleton College **Distinction in Major and Thesis**, *Philosophy.*
Distinction in Major and Capstone, *Computer Science.*
- Travel Awards **RLDM, ICML, AAI, NeurIPS, Brown.**
- Misc. **The Automated Poet**, Discover Art Show, Providence, RI.
Best Visualization of Data, *Hack at Brown.*

SERVICE

- Brown CS Faculty-Grad Student Liaison, 2018-2019.
 Ph.D Recruiting Czar, 2018
 Grad Student Social Czar, 2016-2017
 Ph.D Mentorship Program Coordinator, 2017-2019
 Co-organizer, Reinforcement Learning Reading Group, 2017-2018
- Committees RLDM Workshop on Moral Decision Making, *Co-Chair w/ Dan Kasenberg*, 2019.
- Reviewing AAI, 2019, 2020.
 ACM, 2019
 JMLR, 2018, 2019
 ICAPS, 2017
 ICLR, 2019, 2020
 ICML, 2018, 2019
 IEEE Transactions on Neural Networks and Learning, 2017, 2018
 MLJ, 2018, 2019
 NeurIPS, 2018, 2019
 Workshops, ICLR 2019; ICML 2019; RLDM 2019
- Professional Memberships Association for Computing Machinery (ACM).
 International Association for Computing and Philosophy (IACAP).
 Association for the Advancement of Artificial Intelligence (AAAI).