

# Silviu Pitis

🇨🇦 Canadian citizen

✉ silviu.pitis@gmail.com

📍 spitis

🐦 @silviupitis

🔗 Google Scholar

🏠 silviupitis.com

## Research Summary

My ultimate research interest lies in the normative design of general purpose artificial agency: how *should* we design AIs that solve general tasks and contribute positively to society? To date, my work has focused on two more specific questions. First, how should we think about and design goals and abstractions for decision making agents? Second, how can we design such agents to reason about and generalize across a wide range of different goals? My work focuses on large language models and reinforcement learning agents, and applies tools from decision theory, causal inference, neural networks and representation learning. Full research statement available at <https://silviupitis.com/#research>.

## Education

### University of Toronto

PH.D. IN COMPUTER SCIENCE, 4.0/4.0. ADVISOR: JIMMY BA.

Toronto, ON

Sep 2018 - May 2024

### Georgia Institute of Technology

M.S. IN COMPUTER SCIENCE, 4.0/4.0

Atlanta, GA

Sep 2016 - Dec 2017

### Harvard Law School

J.D., *Magna Cum Laude*, 4.2/4.0. JOHN M. OLIN FELLOW IN LAW AND ECONOMICS.

Cambridge, MA

Sep 2011 - May 2014

### Schulich School of Business, York University

B.B.A., *With Distinction*, 8.4/9.0

Toronto, ON

Sep 2006 - May 2010

## Publications

*All papers accessible via my Google Scholar profile*

### CONFERENCE

- **Silviu Pitis**. [Consistent Aggregation of Objectives with Diverse Time Preferences Requires Non-Markovian Rewards](#). Neural Information Processing Systems (NeurIPS). 2023.
- Andrei Muresanu, Yongchao Zhou, Ziwen Han, Keiran Paster, **Silviu Pitis**, Harris Chan, Jimmy Ba. [Large Language Models are Human-Level Prompt Engineers](#). International Conference on Learning Representations (ICLR). 2023.
- **Silviu Pitis**, Elliot Creager, Ajay Mandelkar, Animesh Garg. [MoCoDA: Model-based Counterfactual Data Augmentation](#). Neural Information Processing Systems (NeurIPS). 2022.
- **Silviu Pitis**, Elliot Creager, Animesh Garg. [Counterfactual Data Augmentation using Locally Factored Dynamics](#). Neural Information Processing Systems (NeurIPS). 2020.
- **Silviu Pitis\***, Harris Chan\*, Stephen Zhao, Bradly Stadie, Jimmy Ba. [Maximum Entropy Gain Exploration for Long Horizon Multi-goal Reinforcement Learning](#). International Conference on Machine Learning (ICML). 2020.
- **Silviu Pitis\***, Harris Chan\*, Jimmy Ba. [An Inductive Bias for Distances: Neural Nets that Respect the Triangle Inequality](#). International Conference on Learning Representations (ICLR). 2020.
- **Silviu Pitis**, Michael Zhang. [Objective Social Choice: Using Auxiliary Information to Improve Voting Outcomes](#). International Conference on Autonomous Agents and Multi-Agent Systems (AAMAS). 2020.
- Kristopher De Asis, Alan Chan, **Silviu Pitis**, Daniel Graves, Richard Sutton. [Fixed-Horizon Temporal Difference Methods for Stable Reinforcement Learning](#). AAAI Conference on Artificial Intelligence (AAAI). 2020.
- **Silviu Pitis**. [Rethinking the Discount Factor in Reinforcement Learning: A Decision Theoretic Approach](#). AAAI Conference on Artificial Intelligence (AAAI). 2019.
- **Silviu Pitis**. [Source Traces for Temporal Difference Learning](#). AAAI Conference on Artificial Intelligence (AAAI). 2018.
- **Silviu Pitis**. [Methods for Retrieving Alternative Contract Language Using a Prototype](#). International Conference on Law and Artificial Intelligence (ICAIL). 2017. (Oral, **Best Student Paper**).

### WORKSHOP

- Yangjun Ruan, Honghua Dong, Andrew Wang, **Silviu Pitis**, Yongchao Zhou, Jimmy Ba, Yann Dubois, Chris J. Maddison, Tatsunori Hashimoto. [Identifying the Risks of LM Agents with an LM-Emulated Sandbox](#). Foundation Models for Decision Making Workshop at NeurIPS. 2023.
- **Silviu Pitis**, Ziang Xiao, Alessandro Sordoni. [Canonical Design for Language Agents using Natural Language Reward Models](#). AI meets Moral Philosophy and Moral Psychology Workshop at NeurIPS. 2023.

## WORKSHOP, CONTINUED

- **Silviu Pitis**. Failure Modes of Learning Reward Models for LLMs and other Sequence Models. The Many Facets of Preference-based Learning at ICML. 2023.
- Mingjian Jiang, Yangjun Ruan, Sicong Huang, Saifei Liao, **Silviu Pitis**, Roger Grosse, Jimmy Ba. Calibrating Language Models via Augmented Prompt Ensembles. Deployment Challenges for Generative AI Workshop at ICML. 2023.
- Keiran Paster\*, **Silviu Pitis\***, Sheila A. McIlraith, Jimmy Ba. Return Augmentation Gives Supervised RL Temporal Compositionality. Deep Reinforcement Learning Workshop at NeurIPS. Foundation Models for Decision Making Workshop at NeurIPS. 2022.
- Eric Xu, Jimmy Ba, **Silviu Pitis\***, Harris Chan\*. Temporary Goals for Exploration. Deep Reinforcement Learning Workshop at NeurIPS. 2022.
- **Silviu Pitis**, Elliot Creager, Animesh Garg. Counterfactual Data Augmentation using Locally Factored Dynamics. Object-Oriented Learning Workshop at ICML. 2020. (Contributed talk, **Outstanding Paper**).
- **Silviu Pitis\***, Harris Chan\*, Stephen Zhao, Bradly Stadie, Jimmy Ba. Maximum Entropy Gain Exploration for Long Horizon Multi-goal Reinforcement Learning. Adaptive and Learning Agents Workshop at AAMAS. 2020. (Contributed talk, **Best Paper**).
- **Silviu Pitis\***, Harris Chan\*, Jimmy Ba. ProtoGE: Prototype Goal Encodings for Multi-goal Reinforcement Learning. The 4th Multi-disciplinary Conference on Reinforcement Learning and Decision Making (RLDM). 2019.
- **Silviu Pitis**. Reasoning for Reinforcement Learning. Hierarchical RL Workshop, NeurIPS. 2017.

## PREPRINTS / OLDER UNPUBLISHED WORK

- Silviu Pitis, Michael R. Zhang, Andrew Wang, Jimmy Ba. Boosted Prompt Ensembles for Large Language Models. Arxiv 2023.
- Silviu Pitis. An Alternative Arithmetic for Word Vector Analogies. 2016.
- Silviu Pitis. Punitive Damages in International Trade. Advised by Mark Wu. 2014.
- Silviu Pitis. Designing Optimal Takeover Defenses. Advised by Holger Spamann. 2013.
- Silviu Pitis. Examining Expected Utility Theory from Descriptive & Prescriptive Perspectives. Advised by Archishman Chakraborty. 2010.

## OPEN SOURCE PROJECTS

- Silviu Pitis, Harris Chan, Stephen Zhao. mrl: modular RL. [github.com/spitis/mrl](https://github.com/spitis/mrl). Github. 2020.
- Silviu Pitis. Swoosh: A leaner, faster backend for Whoosh. [github.com/spitis/PyIndex](https://github.com/spitis/PyIndex). Github. 2016.

## Fellowships & Awards

---

- 2023 - 2024 **SRI Graduate Fellowship**, Schwartz Reisman Institute for Technology and Society
- 2020 - 2023 **Canada Graduate Scholarship - Doctoral (CGS D)**, Natural Sciences and Engineering Research Council of Canada
- 2019 - 2024 **Vector Institute Research Grant**, Vector Institute
- 2019 - 2020 **Ontario Graduate Scholarship (OGS)**, Government of Ontario
- 2018 - 2022 **Faculty of Arts and Science Top (FAST) Doctoral Fellowship**, University of Toronto
- 2018 **Faculty of Arts and Science Entrance Scholarship**, University of Toronto
- 2017 **Don Berman Best Student Paper**, International Conference on Law and Artificial Intelligence
- 2013 - 2014 **John M. Olin Fellowship in Law & Economics**, Olin Center for Law & Economics (1 of 3 in HLS Class of 2014)
- 2011 - 2014 **Dean's Scholar Prize (8x)**, Harvard Law School (awarded to top 1-2 students in large classes)
- 2006 - 2010 **York University Renewable Entrance Scholarship**, York University
- 2006 **Invitee**, Canadian Mathematics Olympiad (1 of 60 in Canada)

## Service

---

### REVIEWER / PROGRAM COMMITTEE

- |                |                |              |                |
|----------------|----------------|--------------|----------------|
| • NeurIPS 2022 | • ICML 2021    | • ICML 2020  | • NeurIPS 2019 |
| • ICML 2022    | • ICLR 2021    | • IJCAI 2020 | • ICML 2019    |
| • AAAI 2022    | • AAAI 2021    | • AAAI 2020  |                |
| • NeurIPS 2021 | • NeurIPS 2020 | • IJCAI 2019 |                |

## Teaching & Supervision

---

### INSTRUCTOR

- Introduction to Machine Learning (CSC311). Fall 2020. (Joint with Roger Grosse, Chris Maddison, Juhan Bae).

## TEACHING ASSISTANT

- Neural Networks and Deep Learning (CSC413/2516). Spring 2020.
- Machine Learning and Data Mining (CSC411). Spring 2019.
- Introduction to Artificial Intelligence (CSC384). Fall 2018.

## RESEARCH SUPERVISION / MENTORING

- Blair Yang. Automatic Model Cards for Large Language Models. 2023. (Joint with Michael R. Zhang, Keiran Paster, Pashootan Vaezipoor).
- Andrew Wang. Variable Rate Discounting as Implicit Bayesian Reinforcement Learning. 2021-2022.
- Eric Xu. Temporary Goals for Exploration. 2021-2022. (Joint with Harris Chan).
- Ian Jiang. Architectures for Learning Local Causal Graphs. FY2021. (Joint with Elliot Creager, Animesh Garg).
- Andrew Gritsevskiy. Leveraging Heuristic Search in Goal-Conditioned RL. 2020-2021. (Joint with Harris Chan).
- Stephen Zhao. Layer-Wise Contrastive Unsupervised Representation Learning. Summer-Fall 2019. (Joint with Jimmy Ba).
- Kiarash Jamali. Metric Nearness Experiments for Deep Norms. 2019-2020. (Joint with Harris Chan).
- Bohan Zhang. Towards Unifying Deterministic and Stochastic Deep Reinforcement Learning Algorithms. Undergraduate Thesis (ESC499). Spring 2019. (Joint with Jimmy Ba).

# Industry/Professional Experience

## Microsoft Research

RESEARCH INTERN (LARGE LANGUAGE MODELS; WITH ALESSANDRO SORDONI, ZIANG XIAO, NICOLAS LE ROUX)

Montreal, QC  
May 2023 - May 2024

## Kirkland & Ellis LLP

ASSOCIATE (CORPORATE LAW; PRIVATE EQUITY, PUBLIC M&A AND CROSS-BORDER TRANSACTIONS)  
SUMMER ASSOCIATE

New York, NY  
Oct 2014 - Mar 2016  
May 2013 - Aug 2013

## Harvard University

RESEARCH ASSISTANT (LAW & ECONOMICS; WITH PROFESSOR LOUIS KAPLOW)

Cambridge, MA  
Feb 2012 - May 2013

## Pokerstars

PROFESSIONAL ONLINE POKER PLAYER

Toronto, ON  
Jan 2008 - Aug 2011

# Other

## AFFILIATIONS

- Schwartz Reisman Institute. 2023 to present.
- Vector Institute for Artificial Intelligence. 2018 to present.
- AAAI. 2017 to 2021.
- New York Bar. 2015 to present.
- Recurse Center. Spring 2016.
- John M. Olin Center for Law and Economics. 2013 to 2014.

## PROGRAMMING

- Poker hand evaluator and Nash equilibrium solver (Java).
- Real-time multi-user whiteboard application (Javascript).
- Contract aggregator and multi-way diff tool (C#, F#).
- Proprietary stock valuation model (Python, Tensorflow).
- Search engine (Python, 2x faster than best Python alternative).
- Deep reinforcement learning framework (Python, Pytorch).

## PRIVATE TUTORING / COACHING

- Poker. 2008 to 2011.
- Management statistics (undergraduate level). 2008.
- Math and physics (gifted high school level). 2006 to 2008.

## ENTREPRENEURIAL & RELATED

- Smart Contract Developer/Auditor (independent). 2021 to 2022.
- NextAI, Scientist-in-Residence. 2019 to 2020.
- DealWIP (legal tech startup). Advisor, 2019.
- iAgree LLC (alt. dispute resolution startup). Consultant. 2012.
- SCOPE. Cofounder & Director. 2006 to 2009. Not-for-profit that recruited over 60 student volunteers and ran goal-setting workshops for over 2000 Toronto high school students.