

Maayan Shvo - CV

✉ maayan.shvo@gmail.com 🏠 www.cs.toronto.edu/~maayanshvo/

Research Interests

Critical to successful human interaction is a capacity for empathy - the ability to understand and share the thoughts and feelings of another. Artificial Intelligence (AI) systems are increasingly required to interact with other agents (be they human or artificial), but are lagging in their ability to empathize with them when reasoning about their behavior. By drawing from research in Psychology, AI, Machine Learning (ML), and Human-Computer Interaction (HCI), I aspire to develop intelligent systems that wield empathy as a tool to benefit those with whom they interact.

Education

University of Toronto	Toronto, Canada
<i>Ph.D. in Computer Science</i>	
<i>Thesis Title - Theory of Mind Reasoning in Explanation, Plan Recognition, and Assistance: Theory and Practice</i>	9.2018 - 06.2023
<i>Awarded the Honorable Mention for Best Dissertation Award at ICAPS 2024</i>	
<ul style="list-style-type: none">Ph.D. Supervisory Committee:<ul style="list-style-type: none">Prof. Sheila A. McIlraith (Advisor)Prof. Daniel J. Wigdor (Member)Prof. Rick Valenzano (Member)	
Utrecht University	Utrecht, Netherlands
<i>M.Sc. in Artificial Intelligence (Graduated Cum Laude)</i>	
<i>Thesis Title - Broadening the Scope of Multi-Agent Plan Recognition: Theory and Practice</i>	9.2016 - 7.2018
University of Toronto	Toronto, Canada
<i>International Visiting Graduate Student (IVGS) Under the Supervision of Prof. Sheila McIlraith</i>	1.2018 - 6.2018
University of Toronto	Toronto, Canada
<i>Undergraduate Exchange Student</i>	9.2015 - 12.2015
Tel-Aviv University	Tel-Aviv, Israel
<i>B.Sc. in Psychology and Computer Science</i>	10.2012 - 6.2016

Employment

Openstream.ai	Toronto, Canada
<i>Research Scientist</i>	1.2023 - 6.2024
<ul style="list-style-type: none">Conducted research and development on a neuro-symbolic conversational AI systemDeveloped semantic parsing datasets comprising pairs of natural language and corresponding logical form and experimented with a variety of large language models (LLM), both by fine-tuning the model and via in-context learningIntegrated fine-tuned LLM-based semantic parsers with the symbolic dialogue engine, with a view towards productionization of the overall dialogue systemPlayed a key role in the creation of multiple demo systems for customers by adapting both the symbolic dialogue engine as well as the semantic parser to various domains of interest	
Samsung AI Center Toronto	Toronto, Canada
<i>Research Intern (Full Time)</i>	6.2019 - 7.2019
<ul style="list-style-type: none">Led a reinforcement learning project focused on training agents to accomplish tasks in mobile apps, with the aspiration of creating 'smarter smartphones' that can better assist their users (resulted in a publication)Worked on two projects integrating Natural Language Processing (NLP), computer vision, and knowledge representation & reasoning. One of these projects involved real-time cognitive assistance and resulted in a publication	

Samsung AI Center Toronto

Toronto, Canada

Research Intern (Part Time)

8.2019 - 10.2021

- The description of work carried out at Samsung pertains to the entire period of my employment there, from June 2019 until October 2021.

University of Toronto

Toronto, Canada

Teaching Assistant

- CSC2542: Topics in Knowledge Representation and Reasoning (Winter 2021)
- CSC384: Introduction to Artificial Intelligence (Winter 2019)
- CSC384: Introduction to Artificial Intelligence (Winter 2018)

Disney Research

Los Angeles, CA, USA

Lab Associate

5.2018 - 8.2018

- Motivated by the objective of building intelligent agents that can believably interact with humans, I developed a computational model of affect which incorporated an empirically-based interplay between its various affective components - personality, motivation, emotion, and mood (resulted in a publication and a patent)

Philips Research

Eindhoven, Netherlands

Research Intern

11.2016 - 5.2017

- Conducted research utilizing deep learning techniques (and involving large medical datasets) with the goal of improving patient care

IBM Thomas J. Watson Research Center

Yorktown Heights, NY, USA

Research Intern

6.2016 - 9.2016

- Conducted research in the field of automated planning and plan recognition, which is the problem of inferring the goals and plans of agents given a set of observations (resulted in a publication)

Intel Corporation

Petah Tikva, Israel

Software Development Intern

4.2014 - 8.2015

- Worked as a software development intern in the WDE (Wireless Display Extension) team, WiGig technology group

Experience & Projects

Agent-Based Simulation of Inner-City Gentrification

Utrecht University

9.2017 - 11.2017

- As part of a research project, under the supervision of Prof. Frank Dignum, I created an agent based model for simulating the gentrification process using a multi agent system design

Deep Learning Research Project

Tel-Aviv University

2.2016 - 6.2016

- As part of a research project, under the supervision of Prof. Lior Wolf, I experimented with variations of state-of-the-art deep learning techniques on the Language Modeling and NER tasks

Research Assistant at the University of Toronto

University of Toronto

9.2015 - 12.2015

- Assisted with research in the Knowledge Representation & Reasoning lab at U of T, focusing on non-deterministic planning
- Improved the state-of-the-art FOND planning platform, PRP, by applying new methods, involving heuristics and dead-end pruning

End-To-End Tool Development at Intel

Intel Corporation

2.2015 - 8.2015

- Developed, end-to-end, a working parsing tool for a cutting-edge wireless technology
- The tool's goal was to sniff messages delivered wirelessly from the transmitter to the receiver, parse those messages and display them in a readable and interactive user-interface

Seminar Work in Social Psychology

Tel-Aviv University

2.2015 - 8.2015

- Designed and implemented a study aimed at evaluating the effect of an empathy manipulation on attitudes towards an outgroup

Seminar Work in Computer Science

Tel-Aviv University

2.2015 - 7.2015

- Created a web-site aimed at curating a daily playlist based on the Wisdom of Crowds and top-ranking songs in the radio music charts
- Utilized different APIs made available by Facebook, Twitter and Google

Research Internship

University of Applied Sciences of Western Switzerland

8.2013 - 10.2013

- Conducted research focused on real-time energy monitoring systems and implemented a research prototype of the system

Programming Languages

Good Working Knowledge of Python & Prolog
Working Knowledge of JavaScript, Java, C & PHP

Publications

Maayan Shvo, Ruthrash Hari, Ziggy O'Reilly, Sophia Abolore, Nina Wang, Sheila A. McIlraith.

“Proactive Robotic Assistance via Theory of Mind”

In Proceedings of the 2022 IEEE/RSJ International Conference on Intelligent Robots and Systems (IROS 2022), pp. 9148–9155, 2022

Maayan Shvo, Toryn Q. Klassen, Sheila A. McIlraith. “Resolving Misconceptions about the Plans of Agents via Theory of Mind”

In Proceedings of the Thirty-Second International Conference on Automated Planning and Scheduling (ICAPS 2022), pp. 719–729, 2022

Maayan Shvo, Zhiming Hu, Rodrigo Toro Icarte, Iqbal Mohamed, Allan D. Jepson and Sheila A. McIlraith. “AppBuddy: Learning to Accomplish Tasks in Mobile Apps via Reinforcement Learning”

In Proceedings of the Thirty-Fourth Canadian Conference on Artificial Intelligence (CANAI 2021), 2021

Maayan Shvo, Andrew C. Li, Rodrigo Toro Icarte, Sheila A. McIlraith. “Interpretable Sequence Classification via Discrete Optimization”

In Proceedings of the Thirty-Fifth AAAI Conference on Artificial Intelligence (AAAI 2021), pp. 9647–9656, 2021

Maayan Shvo, Toryn Q. Klassen, Sheila A. McIlraith. “Towards the Role of Theory of Mind in Explanation”

In Proceedings of Second International Workshop on EXplainable TRansparent Autonomous Agents and Multi-Agent Systems (EXTRAAMAS 2020), pp. 75–93, 2020

Maayan Shvo, Toryn Q. Klassen, Shirin Sohrabi, Sheila A. McIlraith. “Epistemic Plan Recognition”

In Proceedings of the 19th Conference on Autonomous Agents and Multi-Agent Systems (AAMAS 2020), pp. 1251–1259, 2020

Maayan Shvo, Sheila A. McIlraith. “Active Goal Recognition”

In Proceedings of the Thirty-Fourth AAAI Conference on Artificial Intelligence (AAAI 2020), pp. 9957–9966, 2020

Maayan Shvo, Jakob Buhmann and Mubbair Kapadia. “An Interdependent Model of Personality, Motivation, Emotion, and Mood for Intelligent Virtual Agents”

In Proceedings of the 19th ACM International Conference on Intelligent Virtual Agents (IVA 2019), pp. 65–72, 2019

Maayan Shvo. “Towards Empathetic Planning and Plan Recognition”

In Proceedings of the 2019 AAAI/ACM Conference on AI, Ethics, and Society (AIES Doctoral Consortium)

Maayan Shvo, Shirin Sohrabi and Sheila A. McIlraith. "An AI Planning-Based Approach to the Multi-Agent Plan Recognition Problem"

In Proceedings of the Thirty-First Canadian Conference on Artificial Intelligence (CANAI 2018), pp. 253–258, 2018

Awards

2024 ICAPS 2024 Best Dissertation Award - Honorable Mention

2020 - 2021 Graduate Fellow at the Schwartz Reisman Institute for Technology and Society

2017 - 2019 AAIL Student Scholarship

2018 Panitch Beckow Memorial Scholarship Canada