

Theo Olausson

📍 Cambridge, MA, USA

✉ theoxo@mit.edu | 🏠 theoxo.xyz | 📷 theoxo

👤 Summary

PhD student and **Presidential Fellow ('21)** at MIT. Interested in combining **symbolic reasoning** and **deep learning** through **neural program synthesis** and **neurosymbolic AI** to build intelligent systems which are safe, interpretable, and reliable. 4+ years of experience carrying out research in both academic and industrial environments.

🎓 Education

Massachusetts Institute of Technology

Cambridge, MA, USA

PH.D. IN COMPUTER SCIENCE

September 2021 - May 2026

ADVISOR: Professor Armando Solar-Lezama, Computer Science and Artificial Intelligence Laboratory

RESEARCH INTERESTS: neurosymbolic AI, program synthesis, interpretability and safety in AI/ML

MODULES: inference in probabilistic graphical models, program analysis, neurosymbolic methods in NLP

University of Edinburgh

Edinburgh, United Kingdom

MASTER OF INFORMATICS, FIRST CLASS (HONOURS)

September 2016 - May 2021

ADVISOR: Professor Vijay Nagarajan

THESES: *Towards the Automatic Synthesis of Cache Coherence Protocols* (BSc), *Generating Gem5 Cache Coherence Controllers with ProtoGen* (MInf)

SUMMARY OF MASTER'S-LEVEL MODULES: NLP, deep learning, Bayesian machine learning, algorithmic game theory

GRADUATED **RANK 1** OUT OF THE ENTIRE COHORT

👜 Industry Experience

Microsoft Research

Redmond, WA, USA

RESEARCH INTERN - DEEP LEARNING

May 2022 - August 2022

SUPERVISOR: Dr. Jeevana Inala, Dr. Chenglong Wang

RESEARCH AREA: AI for code; large language models; neural program synthesis

Arm

Cambridge, United Kingdom

RESEARCH INTERN - MEMORY & SYSTEMS ARCHITECTURE

June 2019 - August 2019

SUPERVISOR: Dr. Nikos Nikoleris

RESEARCH AREA: Formal verification of memory persistency models

🏆 Recent Awards, Studentships & Grants

2021	Presidential Fellowship , Massachusetts Institute of Technology	\$92,123
	Master of Informatics Class Prize , Univ. of Edinburgh	
2020	ICSA Studentship , Institute for Computing Systems Architecture, Univ. of Edinburgh	£25,620

>_ Skills

PROGRAMMING LANGUAGES Python Rust OCaml Haskell C/C++ Kotlin

TOOLS/FRAMEWORKS Git VCS Linux PyTorch Murphi Coq Agda

THEORY Machine Learning Probabilistic Graphical Models Lambda Calculus Type Theory Game Theory

LANGUAGES English (fluent) Swedish (native)



Teaching, Service & Extracurricular

- 2021-2022 **Vice President of Student Life**, EECS Graduate Student Association, MIT
2018 **Tutor**, Informatics 1 – Introduction to Computation, Univ. of Edinburgh

Publications

PEER REVIEWED PAPERS

- M. Bowers, **TX. Olausson**, C. Wong, G. Grand, JB. Tenenbaum, K. Ellis, A. Solar-Lezama. *Top-Down Synthesis For Library Learning*. To appear at the 50th ACM SIGPLAN Symposium on Principles of Programming Languages (POPL 2023), Boston, USA, 2023.
- N. Oswald, V. Nagarajan, D. Sorin, V. Gavrielatos, **T. Olausson**, R. Carr. *HeteroGen: Automatic Synthesis of Heterogeneous Cache Coherence Protocols*. The 28th IEEE International Symposium on High-Performance Computer Architecture (HPCA-28), IEEE Press, Seoul, South Korea, 2022.
- S. Müksch*, **T. Olausson***, J. Wilhelm*, P. Andreadis. *Benchmarking the Accuracy of Algorithms for Memory-Constrained Image Classification*. The First Workshop on Edge Computing and Communications (EdgeComm) at the Fifth ACM/IEEE Symposium on Edge Computing (SEC 2020), San Jose CA, November 11-13, 2020. *Note: * = co-first author.*

DISSERTATIONS

- T. Olausson**. *Generating Gem5 Cache Coherence Controllers from Atomic Specifications*. Master of Informatics (Part 2) dissertation, School of Informatics, University of Edinburgh, May 2021.
- T. Olausson**. *Towards the Automatic Synthesis of Cache Coherence Protocols*. Master of Informatics (Part 1) dissertation, School of Informatics, University of Edinburgh, May 2020. **Nominated for best undergraduate dissertation.**