Theo **Olausson**

Cambridge, MA, USA
theoxo@mit.edu | theoxo.xyz | theoxo

Summary

PhD student and **Presidential Fellow** at MIT. Interested in combining **symbolic methods** and **machine learning** to build intelligent systems which are safe, transparent, 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 machine learning, program synthesis, interpretability and safety in AI/ML
MODULES THUS FAR: algorithms for inference in probabilistic graphical models, program analysis, neurosymbolic methods in NLP with applications in human-machine cooperation

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, computer vision, Bayesian machine learning, algorithmic game theory
*Graduated **rank 1** out of the entire cohort*

Industry Experience

Arm *Cambridge, United Kingdom*
RESEARCH INTERN *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*

Teaching, Service & Outreach

Winter '21 **Vice President of Student Life**, EECS Graduate Student Association, MIT
Fall '18 **Tutor**, Informatics 1 – Introduction to Computation, Univ. of Edinburgh

Skills

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

TOOLS/FRAMEWORKS Git VCS Linux PyTorch Murphi Coq Agda

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

LANGUAGES English (fluent) Swedish (native)

Publications

Peer Reviewed Papers

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***.

Preprints

S. Müksch*, **T. Olausson***, J. Wilhelm*, P. Andreadis. Quantitative Analysis of Image Classification Techniques for Memory-Constrained Devices. arXiv preprint 2005.04968, May 2020. Available online: `https://arxiv.org/pdf/2005.04968.pdf`. *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.**