Theo **Olausson**

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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. **Selected as an Outstanding Dissertation.**

T. Olausson. *Towards the Automatic Synthesis of Cache Coherence Protocols*. Master of Informatics (Part 1) dissertation, School of Informatics, University of Edinburgh, May 2020. **Selected as an Outstanding Dissertation.**