Simon Alford

✉ alford@cs.cornell.edu
simonalford42.github.io
Google Scholar

Education

2021–present **Cornell University**.
PhD candidate, Computer Science
Advised by Kevin Ellis

2020–2021 **Massachusetts Institute of Technology**.
M. Eng. in Computer Science
Thesis: *A Neurosymbolic Approach to Abstraction and Reasoning*
Thesis advisor: Tomaso Poggio

2016–2020 **Massachusetts Institute of Technology**.
B.S. in Math and in Computer Science

Publications

Preprint Atharv Sonwane, Eng-Shen Tu, Wei-Chung Lu, Claas Beger, Carter Larsen, Debjit Dhar, **Simon Alford**, Rachel Chen, Ronit Pattanayak, Tuan Anh Dang, Guohao Chen, Gloria Geng, Kevin Ellis, Saikat Dutta.
OmniCode: A Benchmark for Evaluating Software Engineering Agents. *arXiv preprint, Feb. 2026*

ICLR 2025 Wen-Ding Li, Keya Hu, Carter Larsen, Yuqing Wu, **Simon Alford**, Caleb Woo, Spencer M. Dunn, Hao Tang, Wei-Long Zheng, Yewen Pu, Kevin Ellis.
Combining Induction and Transduction for Abstract Reasoning. *International Conference on Learning Representations (ICLR), 2025*
2024 ARC-AGI Paper Award 1st Place

AAAI 2025 (workshop) Edward Gu, **Simon Alford**, Omar Costilla-Reyes, Miles Cranmer, Kevin Ellis.
InceptionSR: Recursive Symbolic Regression for Equation Synthesis. *AAAI Workshop on AI to Accelerate Science and Engineering (AI2ASE), 2025*

ICML 2022 (workshop) **Simon Alford**, Zenna Tavares, Kevin Ellis.
Desiderata for Abstraction. *International Conference on Machine Learning "Beyond Bayes: Paths Towards Universal Reasoning Systems" workshop, July 2022*

Master's Thesis **Simon Alford**
A Neurosymbolic Approach to Abstraction and Reasoning.

Complex Networks 2021 **Simon Alford**, Anshula Gandhi, Akshay Rangamani, Andrzej Banburski, Tony Wang, Sylee Dandekar, John Chin, Tomaso A. Poggio, Peter Chin.
Neural-guided, Bidirectional Program Search for Abstraction and Reasoning. *Complex Networks and their Applications, Nov. 2021*

IEEE HPEC 2020 Jeremy Kepner, **Simon Alford**, Vijay Gadepally, Michael Jones, Lauren Milechin, Albert Reuther, Ryan Robinett, Sid Samsi.
GraphChallenge.org Sparse Deep Neural Network Performance. *At IEEE High Performance Extreme Computing Conference (HPEC), Sep. 2020*

NeurIPS 2020 (workshop) Andrzej Banburski*, **Simon Alford***, Anshula Gandhi*, Sylee Dandekar, Sang Chin, Tomaso A. Poggio.
Dreaming with ARC. *Neural Information Processing Systems "Learning Meets Combinatorial Algorithms" workshop, Dec. 2020*
*equal contribution

IEEE HPEC 2019 **Simon Alford**, Ryan Robinett, Lauren Milechin, Jeremy Kepner.
Training Behavior of Sparse Neural Network Topologies. *At IEEE High Performance Extreme Computing Conference (HPEC), Sep. 2020*
Best Paper Award

IEEE HPEC 2019 Jeremy Kepner, **Simon Alford**, Vijay Gadepally, Michael Jones, Lauren Milechin, Ryan Robinett, Sid Samsi.
Sparse Deep Neural Network Graph Challenge. *At IEEE High Performance Extreme Computing (HPEC) conference, Sep. 2019*

IEEE MIT URTC 2018 **Simon Alford**, Ryan Robinett, Lauren Milechin, Jeremy Kepner.
Pruned and Structurally Sparse Neural Networks. *At IEEE MIT Undergraduate Research Technology Conference, Oct. 2018*

Ongoing Work

Under review **Simon Alford**, Edward Gu, Omar Costilla-Reyes, Dan Tamayo, Miles Cranmer, Kevin Ellis. Distilling neural networks into equations that predict instability of planetary systems. *Under review at Nature (submitted Dec. 2025)*

Work Experience

Jun.–Aug. 2017 **Germain APM**, *R&D Summer Intern in Denver, CO*.

- Researched unsupervised machine learning methods (K-means, hidden Markov models, CM-SPADE) to automatically discover patterns from a 20+ million point Siebel UX clickstream dataset for a software analytics startup.