

# ALEXANDER

## BAGNALL

### CONTACT INFO

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### ABOUT ME

I'm graduating this Spring (having already defended my dissertation) with a PhD in Computer Science from Ohio University. My research is focused on programming languages and formal verification, with application to formally verified compilation of probabilistic programs.

### EXPERIENCE

**INSTRUCTOR** **2021-2022**  
*Ohio University* | Athens, OH  
(Taught CS3200 (Organization of Programming Languages) and CS4100 (Formal Languages and Compilers).)

- Designed series of assignments in Pyret and OCaml for teaching PL fundamentals. Course web page: <https://github.com/OUPL/cs3200-f21>.
- Designed compiler project in Rust targeting stack-based VM architecture. Course web page: <https://github.com/OUCompilers/cs4100-sp21>.

**INTERN** **Summer 2021**  
*Galois, Inc.* | Portland, OR

- Designed and implemented compiler in Haskell from Golang to symbolic execution backend for formal verification. Available at: <https://github.com/GaloisInc/crucible/tree/master/crucible-go>.

### EDUCATION

**PhD in Computer Science (Nearing Completion)** **2017-2023**  
*Ohio University* | Athens, OH

- Dissertation title: "Formally Verified Samplers From Discrete Probabilistic Programs".
- G.E. and G.V. Smith Memory Engineering Award

**BS in Computer Science** **2012-2016**  
*Ohio University* | Athens, OH

### PUBLICATIONS

## Articles

**Bagnall, Alexander**, Samuel Merten, and Gordon Stewart (2017a). "A Library for Algorithmic Game Theory in Ssreflect/Coq". In: *Journal of Formalized Reasoning* 10, pp. 67-95. DOI: 10.6092/issn.1972-5787/7235. URL: <http://ace.cs.ohio.edu/~abagnall/papers/jfr2017games.pdf>.

## Papers

**Bagnall, Alexander**, Samuel Merten, and Gordon Stewart (2017b). "Brief Announcement: Certified Multiplicative Weights Update". In: *Proceedings of PODC'17*, pp. 459-461. DOI: 10.1145/3087801.3087852. URL: <http://ace.cs.ohio.edu/~abagnall/papers/podc2017briefmwu.pdf>.

**Bagnall, Alexander** and Gordon Stewart (2019). "Certifying the True Error: Machine Learning in Coq with Verified Generalization Guarantees". In: *Proceedings of AAAI'19*, pp. 2662-2669. DOI: 10.1609/aaai.v33i01.33012662. URL: <http://ace.cs.ohio.edu/~abagnall/papers/aaai2019mlcert.pdf>.

**Bagnall, Alexander**, Gordon Stewart, and Anindya Banerjee (2020). "Coinductive Trees for Exact Inference of Probabilistic Programs". In: *LAFI'20*. URL: <http://ace.cs.ohio.edu/~gstewart/papers/lafi20-bagnall.pdf>.

Merten, Samuel, **Bagnall, Alexander**, and Gordon Stewart (2018). "Verified Learning Without Regret - From Algorithmic Game Theory to Distributed Systems with Mechanized Complexity Guarantees". In: *Proceedings of ESOP'18* 10801, pp. 561-588. DOI: 10.1007/978-3-319-89884-1\_20. URL: <http://ace.cs.ohio.edu/~abagnall/papers/esop2018cage.pdf>.

## Preprints

**Bagnall, Alexander**, Razvan Bunescu, and Gordon Stewart (2018). "Training Ensembles to Detect Adversarial Examples". In: *CoRR* abs/1712.04006. DOI: 10.48550/ARXIV.1712.04006. URL: <https://arxiv.org/abs/1712.04006>.

**Bagnall, Alexander**, Gordon Stewart, and Anindya Banerjee (2022). "Formally Verified Samplers From Probabilistic Programs With Loops and Conditioning". In: *CoRR* (to appear in *PLDI'23*) abs/1712.04006. DOI: 10.48550/ARXIV.2211.06747. URL: <https://arxiv.org/abs/2211.06747>.

– (2023). "Inductive Reasoning for Coinductive Types". In: *CoRR*. DOI: 10.48550/arXiv.2301.09802. URL: <https://arxiv.org/abs/2301.09802>.

## REFERENCES

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