ALEX BAGNALL

CONTACT INFO

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ABOUT ME

PhD in Computer Science from Ohio University. I'm a strong generalist programmer with teaching experience and publications on formal verification of probabilistic programming and machine learning systems.

EXPERIENCE

INSTRUCTOR, TEACHING/RESEARCH ASSISTANT — 2021-2022

Ohio University | *Athens, OH*

(Taught CS3200 (Organization of Programming Languages) and CS4100 (Formal Languages and Compilers).)

- Designed projects, gave all lectures, and tutored students.

INTERN — Summers 2018, 2020

Galois, Inc. | *Portland, OR*

- Developed Coq library for solving recursive domain equations. See: github.com/bagnalla/recursive-domains.
- Implemented compiler in Haskell from Golang to strongly-typed symbolic execution backend for SMT-based verification. See: github.com/GaloisInc/golang and github.com/GaloisInc/crucible/tree/master/crucible-go.

INTERN / APPLICATION DEVELOPER — Summer 2015

Society of Cardiovascular Patient Care | *Columbus, OH*

- Developed CRM applications with C#/ASP.NET MVC and HTML/JavaScript

EDUCATION

PhD in Computer Science — 2017-2023

Ohio University | *Athens, OH*

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

HOBBY PROJECTS

AAL, s-expression viewer, hakan, nash, TempleOS Lisp

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.

– (2023a). "Formally Verified Samplers From Probabilistic Programs With Loops and Conditioning". In: *CoRR (to appear in PLDI'23)* abs/2211.06747. DOI: 10.48550/arXiv.2211.06747. URL: https://arxiv.org/abs/2211.06747.

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 (2023b). "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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