# Samuel Stewart

## Research Experience

2015-2020

**Graduate Research Assistant (Minneapolis, MN)**

* Implemented spectral method in Matlab to obtain numerical evidence of attractor solutions for a fluid model.
* Proved existence of attractor solutions using techniques from spectral theory and published the results in top journal.
* Designed and wrote fast algorithm for simulating a crowd model.

2017

**Tractors for Africa (Burkina Faso)**

* Acted as language and cultural liason between US team and local team in a rural town in Burkina Faso.
* Wrote weekly reports for US team
* Managed finances of local team and coordinated funds with US team

2012-2015

**Summer Undergraduate Research Experiences (Portland, OR)**

* Coded a custom PDE solver in Python / Numpy for a nonlinear wave equation to find numerical evidence of blowup and presented my results at the Joint Mathematical Meetings.
* Developed custom library in Mathematica to search through thousands of examples to help prove a statistical classification condition and published classification result in undergraduate journal.
* Built and deployed a parallelized Computer Go player across a cluster of five machines to compare voting schemes.
* Wrote statistical compression algorithm for a Computer Go player that significantly reduced memory usage and published the results in AI journal.

## Work Experience

2013 - 2015

**Contract Developer, Upsight Analytics (Portland, OR)**

* Wrote Android advertising framework that served millions of ads per month
* Built an automated UI testing framework
* Mentored junior developers
* Patched mission-critical bugs in both iPhone and Android SDKs

2011

**iPhone Development Intern, Yelp Reservations (San Francisco, CA)**

* Wrote core UI components for main application now used by hundreds of restaurants

## Publications

* "De Gregorio's Equation: a 1D model of Euler equations with Swirl". Hoa, J; Stewart, S; Sverak, V. *Archive for Rational Mechanics and Analysis* 2 (2019): 1269-1304. Print
* "Orbigraphs - Graph Theoretic Analogue of Orbifolds". Daly, K; Gavin, C; Montes de Oca, G; Ochoa, D; Stanhope, E; Stewart, S. To appear in *Involve, a Journal of Mathematics.*
* "Two Online Learning Playout Policies in Monte Carlo Go: An Application of Win/Loss State." Basaldua, J; Stewart, S; Moreno-Vega, JM; Drake, PD. *IEEE Transactions on Computational Intelligence and AI in Games* 1 (2014): 46-54. Print.

## Presentations

* "Lost in the Crowd: How Mathematicians Model Crowds" at Cafe Scientifique, Duluth, MN, Nov 29, 2018.
* Presented "The Beautiful Problem of Turbulence" at Café Scientifique, Minneapolis, MN, Jan 17, 2017.
* "Wave Equations with Quadratic Nonlinearities" at the Joint Mathematical Meetings, San Antonio, TX, Jan 10-13, 2015.

## Posters

* "Cellular Automata Models of Dense Crowds", Pedestrian Dynamics: Modeling, Validation, and Calibration, Brown University, Providence, RI. Aug 21 - 25, 2017.

## Skills

**Programming:** Unix, Git, Python, C, Mathematica, Matlab, R, Julia, Java  
**Math:** PDEs, convex optimization, numerical PDE **Languages:** French (professional working proficiency)

## Education

2020

**PhD Candidate, Mathematics, University of Minnesota** (Minneapolis, MN).

2017

**Master of Science, Mathematics, University of Minnesota** (Minneapolis, MN).

2011-2015

**Bachelor of Mathematics, Lewis & Clark College** (Portland, OR).

2014

**Budapest Semesters in Mathematics** (Budapest, Hungary).

* Took three graduate level classes
* Studied Hungarian and interacted with local culture via language exchange

## Awards

2017

National Defense Science and Engineering Graduate Fellowship Competitive (<10% awarded) fellowship with four years of full funding. 2014

Phi Beta Kappa

[sams@umn.edu](mailto:sams@umn.edu) • 503-877-2851 • <https://github.com/samstewart>  
Minneapolis, MN