

Nathan Sanford

723 W Melrose St, Apt 2R, Chicago, IL 60657
phone: (253) 326-9902

email: nathansanford2013@u.northwestern.edu
GitHub: github.com/natsan91
LinkedIn: linkedin.com/in/nathan-sanford-1b3476162/

PROFESSIONAL SUMMARY

A data scientist trained in applied mathematics who is interested in developing and using algorithms to solve problems and analyze data sets that have real-world impacts.

EDUCATION

- **Northwestern University** Evanston, Illinois
Ph.D. in Applied Mathematics 2013 – expected *Spring 2020*
 - **Thesis:** Rare Events in Mode-Locked Lasers
 - **Minor:** Scientific Computing
- **Seattle University** Seattle, Washington
B.S. in Mathematics 2009 – 2013
 - **Summa Cum Laude, Major GPA:** 4.00/4.00, **Overall GPA:** 3.94/4.00
 - **Specialization:** Applied Mathematics, **Minor:** Philosophy

WORK EXPERIENCE

- **Northwestern University** Evanston, Illinois
Research Assistant June 2014 – Present
 - Performed large-scale, parallelized, Monte Carlo simulations to quantify error rates in a mode-locked laser model.
 - Investigated algorithmic improvements to importance sampled Monte Carlo schemes in specialized conditions.
 - Identified novel error path features analytically and numerically using rare event and large deviation theory.
 - Directed research projects independently while learning and using various languages/platforms autonomously.
 - Collaborated with multi-continent research team on algorithm development and paper drafting.
 - Presented research at conferences, interdisciplinary workshops, and departmental seminars.
- **Northwestern University** Evanston, Illinois
Teaching Assistant Sept. 2014 – June 2019
 - Assisted professors in teaching core and advanced undergraduate mathematics classes for 12 quarters.
 - Collaborated with faculty to develop and compose course assessments and materials.
 - Coordinated with 5-15 person teaching teams to organize instruction for lecture sections of over 300 people.
 - Taught students in group settings and provided individualized help to students in office hours.
 - Communicated course concepts to students of various backgrounds throughout the University.
- **Seattle University** Seattle, Washington
Research Assistant Jan. 2012 – Sept. 2013
 - Investigated stability of steep waves in an integro-differential shallow water wave model.
 - Utilized a mixture of analytical and numerical techniques to assess solutions' stability.
 - Collaborated weekly with water wave research group at the University of Washington.
 - Wrote code collaboratively with another student that led to a publication.

PROGRAMMING SKILLS

- **Languages:** C/C++, Python, L^AT_EX
- **OS and Software:** Linux, Windows, MATLAB, R, Mathematica

PUBLICATIONS

- N. Sanford, G.M. Donovan, and W.L. Kath. *Slip Rates and Slip Modes in an Actively Mode-Locked Laser*. *SIAM Journal on Applied Dynamical Systems*, accepted.
- N. Sanford, K. Kodama, J.D. Carter, and H. Kalisch. *Stability of traveling wave solutions to the Whitham equation*. *Physics Letters A*, 2014.