Eion Blanchard

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EDUCATION

University of Illinois at Urbana-Champaign *Champaign, IL*
Doctor of Philosophy, Mathematics Expected May 2023
Researching decidability of logical theories (adviser: Philipp Hieronymi)

University of Illinois at Urbana-Champaign *Champaign, IL*
Master of Science, Applied Mathematics May 2020
Concentration in Computational Science and Engineering (CSE)

University of Florida *Gainesville, FL*
Bachelor of Science, Mathematics May 2018
Degree conferred *summa cum laude* · Honors Program · GPA 3.97
Honors thesis *Measuring Congressional district gerrymandering* (adviser: Kevin Knudson)

INTERESTS

Logical complexity, formal verification, tame geometry, automata theory, ensemble learning, numerical analysis, quantum computing, gerrymandering

RESEARCH / WORK

Sandia National Laboratories *Albuquerque, NM*
Mathematics and Analytics Research & Development Intern May 2020 - Aug 2020
· Crafted visualization tools for network analysis and employed SimGNN, a graph convolutional network, to analyze similarities between simulated temporal networks
· Constructed graph theory-based ensemble method in Python for object detection with FAIR's Detectron2, improving average precision by at least 6% over baseline models

Applied Research Laboratories, University of Texas at Austin *Austin, TX*
Research Engineering Scientist Associate June 2019 - Aug 2019
· Researched quantum computing and error correction under the direction of Brian La Cour
· Implemented cellular-automaton decoder for the color code, using local measurement-based information to correct qubit errors (thresholds below 8.0% for X and 0.8% for Z errors) via code lattices in Python

Illinois Geometry Lab, University of Illinois at Urbana-Champaign *Champaign, IL*
Graduate Research Mentor Aug 2018 - May 2019, Aug 2020 - Present
· Research logic and automatic theorem proving while managing a small team of undergraduate researchers under the direction of Philipp Hieronymi
· Harness MSR's proof assistant Lean to verify basic mathematical proofs; employed Walnut to mechanize arithmetic operations for Ostrowski numeration systems

Metric Geometry and Gerrymandering Group *Cambridge, MA*
Voting Rights Data Institute (VRDI) Fellow June 2018 - July 2018
· Analyzed vast demographic and voting datasets through visualization, topological data analysis, and Markov chain Monte Carlo methods for districting plans under Moon Duchin
· Prototyped *Districtr* web app in Python to facilitate community of interest self-identification

Budapest Semesters in Mathematics, St. Olaf College *Budapest, Hungary*
Study Abroad Student, Eötvös Loránd University June 2017 - Aug 2017
· Conducted research in graph rigidity—specifically, unit disk graphs and compactness in low-dimensions—under the direction of Tibor Jordán

University of Washington *Seattle, WA*
NSF Research Experience for Undergraduates (REU) Participant June 2016 - Aug 2016
· Conducted research on the inverse problem for electrical networks—specifically, graph embeddings on surfaces of extreme genera—under the direction of James Morrow

SKILLS

Intermediate: Python, MATLAB, LaTeX
Basic: Git, SQL, R, QGIS, Java, C++, Lean

Awards

UIUC List of Teachers Ranked As Excellent (Outstanding)	Spr 2019, Fall 2019, Spr 2020
Anderson Scholar, Highest Distinction	Oct 2016
Benacquisto Scholar	Aug 2014 - May 2018
Bright Futures Florida Academic Scholar	Aug 2014 - May 2018
National Merit Scholar	June 2014

Teaching

University of Illinois at Urbana-Champaign — *Champaign, IL*
Graduate Teaching Assistant, Department of Mathematics — Aug 2018 - Present

- Lead discussion and Python programming sections for students in Math 415 Linear Algebra
- Create educational material for and teach an active-learning classroom as part of the Merit program, targeted to support top scholars from underrepresented groups in STEM
- Led weekly discussion sections for students in Math 220/221 Calculus I and Math 231 Calculus II; graded quizzes and exams; held weekly tutoring and office hours

University of Florida — *Gainesville, FL*
Undergraduate Teaching Assistant, Dept. of Computer Science & Eng. — Aug 2016 - May 2018

- Led weekly discussion sections for students in COT3100 Applications of Discrete Structures

Professional

University of Michigan — *Ann Arbor, MI*
LG&TBQ Geometry and Topology Conference — June 2019

- Fostered collaboration and community among queer mathematicians at a week-long mathematics conference for geometry, topology, and dynamical systems

University of Illinois at Urbana-Champaign — *Champaign, IL*
Program for Interdisciplinary and Industrial Internships at Illinois — May 2019

- Completed computational bootcamps in linear algebra, statistical analysis, R, and Python

Out for Undergrad — *San Francisco, CA*
Out for Undergrad Technology Conference (OUTC) — Sept 2015, Sept 2016, Sept 2017

- Workshopped allyship and leveraging queer identity in the tech industry at multi-day summit

Telluride Association — *Ann Arbor, MI*
Telluride Association Summer Program (TASP) — June 2013 - Aug 2013

Talks

Sandia Machine Learning & Deep Learning Workshop — *Albuquerque, NM*
"Ensemble learning with graph inference cliques" — Aug 2020

University of Illinois Computability Seminar — *Champaign, IL*
"When is scalar multiplication decidable?" — Apr 2020

Wolfram Research Summer School — *Champaign, IL*
"Measuring Congressional district meandering and gerrymandering" — Nov 2019

Telus World of Science, Unveiling the Universe Series — *Vancouver, BC, Canada*
"Extreme genera and other techniques of graph embeddings" — Aug 2016

Service

Association for Women in Mathematics — *Champaign, IL*
Member, University of Illinois Chapter — Aug 2018 - Present

Varsity Vocals — *Chicago, IL*
Judge, International Championship of Collegiate A Cappella — Feb 2019 - Present

Involvement

Gestalt — *Gainesville, FL*
Director of Music, Co-Founder — May 2016 - Apr 2018

- Created and directed a cappella group to 1^{st} place at ICCA Quarterfinals and to Runner-up at ICCA Semifinal, SoJam, BOSS, and NACC competitions
- Managed group and individual rehearsals, coordinated repertoire, and engineered production of two albums garnering 13 CARA nominations and 3 wins, including for "Best Debut Album"