Daniel Yoontae **Hwang**

Software Engineer · Mathematician · Educator

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Education

Georgia Institute of Technology
Atlanta, Georgia

Ph.D. in Mathematics — *Aug. 2022 - Present*

- Cumulative GPA: 4.000
- First-year graduate student and Graduate Teaching Assistant for the Math Department.

Duke University
Durham, North Carolina

B.S. in Mathematics and Computer Science — *Aug. 2018 - May 2022*

- Cumulative GPA: 3.864
- **Received a 4-year full-tuition scholarship** as the top scorer in the North Carolina Comprehensive Contest.

Experience

Los Alamos National Laboratory
Los Alamos, NM

Student Researcher — *June 2023 - Aug. 2023*

- Performed research on fully homomorphic encryption schemes utilizing novel mathematical techniques and gave an intenral presentation.

The Social Institute
Durham, NC

Developer Intern — *May 2021 - Aug. 2021*

- Performed comprehensive QA review; wrote detailed feedback and bug reports on their platform promoting healthy social media use.
- Communicated with the Marketing department; contributed to a website advertising their annual summit.

WoTo
Durham, NC

Backend Engineer — *May 2020 - Jan. 2021*

- Contributed to the backend of WoTo, a web app designed for scheduling and holding office hours.
- Created and tested new endpoints on the backend Express API, restructured a MongoDB database to improve user functionality.
- Notable contributions include a dynamic question template, join/leave functionality, and data filtering based on user type.

4th Medical Group, Duke Phoenix Project
Goldsboro, NC

Mobile Developer Intern — *May 2020 - August 2020*

- Implemented a redesigned prototype of 4th Medical Group's mobile application using React Native.
- Lead engineer on navigation menu allowing users to switch between different screens, along with a news screen and directory screen.
- Advised other developers with React Native, organized peer programming sessions.

Research and Academic Experience

Backend Head Teaching Assistant for Data Structures and Algorithms
Durham, NC

Duke Computer Science Department — *Aug. 2019 - May 2022*

- Configured and maintain the autograder, starter code, and JUnit test code for Java projects on GitLab and Gradescope.
- Troubleshooted assignments, student submissions, and students' use of programming tools, as needed.
- Lead weekly discussions and office hours. Guide small groups through short exercises; encourage familiarity with Java and algorithms.

PRUV 2021 Fellow and Independent Researcher
Durham, NC

Duke Math Department | Advisor: Dr. Margaret Regan — *May 2021 - May 2022*

- Researched the set of solutions to a parameterized system corresponding to the steady statesof the ERK biochemical network for various combinations of parameters.
- Utilized homotopy continuation via Bertini to find the pseudo-witness set points of the discriminant locus,separating the parameter space into distinct regions yielding the same number of real solutions.
- Implemented MATLAB code that repeatedly samples over a 2-dimensional subspace of the parameterspace to generate the discrete set of pseudo-witness set points for a given parameterization.

DOMath 2019 Researcher
Durham, NC

Duke Math Department | Advisors: Profs. Thomas Witelski and Jeffrey Wong — *May 2019 - July 2019*

- Modeled the motion of a slider on top of a body of fluid as a MATLAB simulation using differential equations from fluid dynamics.

Presentations

Chesapeake Large-Scale Analytics Conference

Annapolis, MD

PRESENTER *November 1, 2023*

- Expected to present a poster titled *Fully Homomorphic Encryption Schemes For Real-World Usage* based off summer work from Los Alamos.

48th Annual New York State Regional Graduate Mathematics Conference

Syracuse, NY

PRESENTER *April 1st, 2023*

- Gave a 20-minute expository talk titled *Chip-firing, served three ways* based on Part 1 of "*Divisors and Sandpiles: An Introduction to Chip Firing*" by Scott Corry and David Perkinson.
- Chip-firing asks a simple question: "Given an group of people and an initial distribution of dollars among the people, including people in debt, can we redistribute the money such that no one ends up in debt?" This simple question with its origins in combinatorics can be reformulated using concepts from linear algebra, graph algorithms, and even Riemann surfaces.

Skills

Programming Java & JUnit, LaTeX, Node.js, MongoDB, SQL, MATLAB, Python

Web Express with Mongoose and Node.JS, React and React Native, Django with Python, HTML5 with Bootstrap

Tools Git, Postman, Visual Studio Code, IntelliJ