

# Samuel Mercier

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Citizenship: Ireland, United States (Dual Citizen) | Github: <https://github.com/samontea>

## Education

University of Oxford (Exeter College) September 2023 (Expected)  
*M.Sc. in Mathematics and Foundations of Computer Science*

Purdue University (College of Science, Honors College) May 2020  
*B.S. in Mathematics with Departmental Honors. Minors: Computer Science, Philosophy.*

Bachelors Thesis: An Introduction to Homotopy Colimits Advisors: Jeremy K. Miller, Paul VanKoughnett

### Awards & Honors:

- E. V. Schenkman Award (Awarded to the best algebra student in the Dept. of Mathematics) Spring 2020
- Outstanding Senior in Mathematics (Awarded to one senior in the Dept. of Mathematics) Spring 2019
- Merit scholarships covering 97.5% of tuition: 2015–2020  
Presidential Scholarship (University), Marquis Scholarship (University), T. Arai Scholarship (Math Dept.), M. Daniels Early Graduation Scholarship (Indiana Gov.)
- Dean's List 2015–2020 ◦ Senior Achievement Award (Math Dept.) Spring 2020

## Experience

### Selected Work Experience – Software Engineering

Software Engineer 3 MongoDB (New York, NY) – Query Optimization Team Nov. 2021–Sept. 2022

Software Engineer 2 Aug. 2020–Oct. 2021

Implemented query [language optimizations](#) and [new language features](#) for the MongoDB Query Language (MQL). Developed [differential testing](#) strategies using a fuzzer for the database. Extended the [query planner](#) to support new index types and operators. Mentored junior engineers and managed interns. Ran projects as a [technical lead](#). Scoped a project to [open-source](#) the fuzz testing system. Reviewed design documents.

Software Engineer Intern NASA JPL (Pasadena, CA) – Modeling & Verification May 2020–July 2020

Developed “Next-Generation Modeling and Simulation Software” in Java in support of JPL engineering missions (e.g. Europa Clipper). Built a [continuous integration](#) pipeline for daily builds. Expanded functionality of the [modeling SDK](#) by developing Java annotation processors. *Technologies:* Java, Docker, Jenkins, & Python

Software Engineer Intern MongoDB (New York) – Query Team May 2018–Aug. 2018 & May 2019–Aug. 2019

Implemented a new index type which can index all fields of all documents in a given collection. Sped up \$lookup queries by 28x according to performance tests. Recovered technical debt by rearchitecting projection execution. *Technologies:* C++, Python (for testing), & JavaScript (for testing).

Software Engineer Intern MongoDB (New York, NY) – Monitoring Team May 2017–Aug. 2017

Researched and implemented time series analysis techniques for anomaly detection for their “DaaS” platform. Created automated anomaly detection alerts. *Technologies:* Java & MongoDB.

Web Dev. Intern for NASA Systems Engineering NASA JSC (Houston, TX) Jan. 2017–May 2017

Developed requirement management software used throughout NASA. Added routing. Isolated state.

### Work Experience – Teaching

Undergraduate Teaching Assistant Purdue University 2016–2020

Prepared course materials (labs, homework, exams, etc.) and taught the following courses:

- CS 240 (Programming in C) Spring 2020, Fall 2016, Spring 2016
- CS 252 (Systems Programming) Spring 2019, Fall 2018, Spring 2018
- MA 162/MA 161 (Analytic Geom. and Calculus II/I) Spring 2019/Fall 2018 (respectively)

CS 180/CS 240 (Programming in Java/C resp.) Departmental Tutor Purdue University Sept. 2015–Dec. 2015

## Volunteer Experience.....

Tutoring Chicago Volunteer *Sept. 2021–May 2022*  
Tutored low-income, middle school students from local public schools in Math, English, Social Studies, and Science.

BoilerMake Hackathon Executive Board (Dev & User Experience Team) *Jan. 2016–Oct. 2018*

Purdue FIRST Programs (IT Team; IT Director) *Aug. 2015–Dec. 2016*

## Other Work Experience.....

Software Engineer Intern Affirm (San Francisco, CA) – Risk Engineering Team *Sept. 2019–Nov. 2019*  
Expanded the functionality of the underwriting microservice. Made loan decision tasks asynchronous. Expanded integration testing of loan decisioning. *Technologies:* Python, SQL, & Docker.

Software Engineer Intern (Fullstack) Springbuk (Indianapolis, IN) *June 2016–Aug. 2016*  
Led development on a client onboarding application.