

Samuel Mercier

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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

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

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

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.

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

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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.

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