Militsa Sotirova

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EDUCATION

Cornell University, College of Engineering, Ithaca, NY **Estimated May 2022**
Master of Engineering, Computer Science
***Relevant Courses*:** System Security; Database Systems; The Structure of Information Networks

Cornell University, College of Engineering, Ithaca, NY **December 2021**
Bachelor of Science, Computer Science
Minor: Dyson Business Minor for Engineers
GPA: 3.79, Awards: Dean's List
***Relevant Courses*:** Compilers & Compilers Practicum; Distributed Computing Principles; Computer Networks; Cryptography; Operating Systems; Data Structures; Functional Programming; Embedded Systems; Digital Logic and Computer Organization; Analysis of Algorithms; Computer Vision; Discrete Structures; Probability Models and Inference; Linear Algebra

Thomas Jefferson High School for Science and Technology (TJHSST), Alexandria, VA **June 2018**
TJHSST Advanced Diploma: Computer Systems, **GPA: 4.41**
Relevant Courses: Computer Systems Research Lab; Parallel Computing; Cryptography; Computer Vision; App Development

SKILLS

Java, Python, C++, SQL, MQL, Golang, OCaml, JavaScript, HTML/CSS, SQLite, GitHub

WORK EXPERIENCE

MongoDB: Software Engineering Intern, *New York City* **June 2021 - August 2021**

Worked on the query optimization team:

- Implemented the internal swapping of two aggregation stages for better performance
- Implemented the pushdown of a $match stage before an unpack bucket stage to filter and reduce the number of documents needed to be examined in a time-series collection
- Introduced a feature flag to allow execution of the $lookup and $graphLookup aggregation stages to occur in a distributed environment
  - Wrote new integration tests and updated existing ones to reflect the new specification
  - Modified the $graphLookup stage constraints in order to only permit its execution on the proper nodes
- Designed and measured performance benchmarks for the MQL $graphLookup aggregation stage
  - Explored consequences of using different collection sizes, limiting the recursion depth of the query, and using various document shapes as they affected the expected size of the result set
  - Validated results from executions in distributed vs non-distributed environments and targeted vs non-targeted queries

Ruminant Farm Systems (RuFaS) Model: Developer, *Cornell University* **November 2018 - Present**

Designing, developing, maintaining, and testing a Python application for nutrient flow through a farm system; collaborating with student team members and professors from universities nationwide:

- Technical lead of output and data analysis team
  - Implementing different options for data export and analysis for a more complete set of model outputs
- Technical lead of data management team (Summer 2020)
  - Introduced the usage of databases in the project to store input and output data
  - Designed, implemented, and documented a server that hosts a website allowing users to interact with a database that persists outputs of the model. Interactions include presenting the outputs, filtering displayed outputs, and exporting outputs to standard format files (JSON and CSV)
  - Designed reusable Python modules that use SQL in order to achieve above functionality
- Redesigned a substantial amount of inefficient legacy code, reducing application run time by 20% and improving maintainability
- Independently designed and refactored one of the four major components of the model responsible for the animal life cycle and activity
- Introduced unit-testing to the project and continually maintains/encourages development of the testing suite
- Published a paper on the model's design and functionality
- Mentor new team members, perform code reviews on a regular basis
- Presented above contributions at conferences to leaders of the project and potential industry partners