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Ryan Mitchell
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Education

Northeastern University, Boston, MA   **Sep 2018 - May 2022**
Khoury College of Computer Sciences (**GPA: 3.75**)   Candidate for BSCS
Relevant courses:
> GPU Programming, Building Game Engines, Programming Languages, Computer Systems/Networks, Object Oriented Design, Algorithms and Data

Distinctions:
> Honors Program, Deans List, Technology Director for Northeastern Club Esports

Technical Knowledge

Languages: C++, Python, C, Java, C#, TypeScript, JavaScript, SQL, HTML
Systems: MAC OS X, Windows, Ubuntu
Software: LLVM Compiler Infrastructure, IntelliJ IDEA, Eclipse, Visual Studio, GitHub, Jupyter Notebook

Work Experience

Fuzzing LLVM Constraint Research, Northeastern University   **Jan 2021 - Present**
- Analyzing symbolic constraints of target binaries to improve fuzzing/concolic execution.
- Instrumenting LLVM IR to provide compiler-time concolic execution overhead, shown to be an improvement by SymCC research.
- Instrumenting LLVM IR to gather symbolic constraint data, in C++.

Software Development Co-op, Advanced Micro Devices (AMD)   **Jan 2020 - Jun 2020**
- Analyzed shader and game performance through frame captures, using 3DMark and other tooling.
- Developed a MongoDB database system and performance dashboard using Python and the Django framework for handling data collection/presentation of thousands of shaders that are continuously generated.
- Created a TypeScript WebSocket API to stream data to and from the dashboard in the background to not interrupt user workflow.
- Took ownership of the dashboard and proposed plans to further improve developer experience.
- Organized communication with peers and established a feedback loop for constantly improving upon existing work.
- Successfully integrated adjacent projects through the exposure of simple and robust python APIs to my coworkers.

Object Oriented Design TA, Northeastern University   **Sep 2020 - Dec 2020**
- Actively engaged students in coursework, helped students develop good code design habits and strong debugging practices.

Projects

Breakout Game
- Developed a breakout game and underlying game engine.
- Built up a game engine from barebones C++ and the SDL2 library.
- Prioritizes efficient resource management and supports localization and level generation from text files.

Raft Distributed Database
- Implemented the Raft consensus protocol to support a key-value distributed database.
- Made correctness-preserving improvements to optimize for varying RTT and additionally replica failure recovery.
- Maintained good performance and data integrity in the face of leader failures, replica failures, segmentation faults, and unreliable networks.

Your Friendly Pokédex
- Provides a simple command UX that quickly gets users involved with the detailed Pokémon world.
- Co-created a Discord bot in Java that calls custom MySQL procedures to provide advanced Pokédex lookups and analysis of Pokémon teams and items.

Khosury
- Co-developed an OSU clone in C# and using the Unity engine at the HackBeanpot hackathon.
- Used an object pool for efficient resource management.
- Improved user experience by allowing users to create song maps.

Interests: Electric Guitar, Competitive Esports, Rock Climbing, Hiking, Film

References and Private Projects Available Upon Request