Ben Clarage

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Education

University of Illinois Urbana-Champaign Aug 2020 - May 2023
Degree: Bachelor of Science in Mathematics and Computer Science
Accolades: Edmund J. James Scholar, Highest Distinction

University of Illinois Urbana-Champaign Aug 2023 - May 2024
Degree: Master of Computer Science

Experience

Program Verification Graduate Teaching Assistant Aug 2023 – Dec 2023
University of Illinois Urbana-Champaign Computer Science Department

- Graded assignments, answered questions and maintained website *courses.grainger.illinois.edu/cs476/fa2023/*
- Topics included: algebraic specification of programs, rewriting logic specification, modal and temporal logic checking, rewriting logic semantics, model checking and symbolic model checking

Strategic Instructional Innovations Program Developer May 2022 – May 2023
University of Illinois Urbana-Champaign PrairieLearn for Theoretical Computer Science

- Developed resources to support the teaching of algorithms, data structures, and other theoretical aspects of computer science
- Refactored 7 year old codebase of 33,000+ files (net 198,987 lines eliminated) to improve question development

Class Transcribe Developer May 2022 – Aug 2022
University of Illinois Urbana-Champaign Computer Science Department

- Experimented with different Python interfaces for a PostgreSQL database such as Psycopg, Pydal, and SQLAlchemy
- Began transition of C# web API to Python for improvement of future maintainability

Head Course Staff Aug 2021 – May 2022
University of Illinois Urbana-Champaign Into to Computer Science

- Worked with 3 other Head Course Members to oversee 250+ staff and individually mentored a group of Course Associates
- Guided and developed goals for a class with 1400+ students that have led to near equity in grade performance between new and experienced programmers
- Held 1500+ individual student help sessions ranging on topics from debugging Android applications in Kotlin and Java to theoretical algorithm runtime

Course Developer May 2021 – Aug 2021
University of Illinois Urbana-Champaign Computer Science Department

- Implemented source level code mutation for arbitrary Kotlin code to help develop automatic test generation
- Created cyclomatic complexity counter for Kotlin code to give general code performance feedback compared to an ideal solution

Course Staff Associate Jan 2021 – May 2021
University of Illinois Urbana-Champaign Into to Computer Science

- Developed course content using custom code walkthroughs to teach concepts of object-oriented programming
- Ran virtual office hours and moderated course forum

Assorted Projects

Maze Visualization

- N-Dimensional maze generator and solver with a touch interactive 3-dimensional visualization in the browser hosted on Amazon Web Services at *maze.benclarage.com*
- Maze logic written in C++, ported to JavaScript using WebAssembly with Emscripten bindings and visualized with WebGL using three.js

AES Visualization

- Cross-platform (Windows, MacOS, GNU/Linux) implementation and visualization of the 128-bit, 196-bit, and 256-bit versions of the Rijndael Advanced Encryption Standard Algorithm
- Algorithm written in C++, tested with Catch2 and visualized using Cinder

Skills

Languages	C, C++, Python, Java, Kotlin, Java, C#, JavaScript, Clojure, Bash, Assembly, SQL, Cypher
Tools	CMake, Git, Emscripten, Antlr, Docker, MPI, OpenMP, GDB, SQL, Neo4j, MongoDB