

# Aaron Bauer

awb@carleton.edu  
(206) 348-3268  
Northfield, MN

<https://cs.carleton.edu/faculty/awb>  
<https://linkedin.com/in/aaron-bauer-926371157/>  
<https://github.com/awb-carleton>

PhD computer scientist with 15 years programming experience, broad experience across many areas, and a demonstrated ability to quickly learn new technologies and domains. Deep expertise in educational technology, web applications, low-level implementation, concurrency, operating systems, and database systems. Mentored 18 undergraduates across 5 research projects. Looking to join a world-class team and excited to work on significant, high-impact problems.

## Experience

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**Assistant Professor of Computer Science, Carleton College** ..... 2019–present

### *Active research projects:*

*Problem-solving and Collaboration in Open-Ended Environments*

Applying data visualization and machine learning to understand human behavior in the scientific-discovery game *Foldit* and the online strategy game *Starcraft II*. (Python, big data, machine learning)

*Unikernel for Lightweight Serverless Computing*

Implementing a minimal x86-64 kernel to provide lightweight lambdas in a serverless environment.

Using PNG thumbnail generation as proof-of-concept application. (Rust, qemu, Docker, x86-64)

*Dragon Architect: An Educational Computational-Thinking Game*

Creating a web-based game to introduce computational ideas. Designed and implemented the UI and internal interpreter. (JavaScript, HTML/CSS, TypeScript, React, Three.js, Flask, PostgreSQL)

*Practicum: A Scalable Online System for Faded Worked Examples in CS1*

Providing scalable, interactive, automatically-scaffolded introductory CS practice problems. Deployed in a large, real-world experiment. (JavaScript, HTML/CSS, Domain-specific language)

### *Courses taught:*

*Introduction to Computer Science:* Introductory programming in Python

*Data Structures:* Data structure implementation and analysis in Java

*Introduction to Computer Systems:* C memory model, x86 assembly, heap allocation, and networking

*Operating Systems:* File systems, processes, kernels, concurrency, scheduling, and virtual memory

*Database Systems:* SQL, indexes, query processing & optimization, consistency, and crash recovery

**Research Assistant, Computer Science & Engineering, University of Washington** ..... 2012–2019

Designed and implemented research projects across a variety of fields as part of the Center for Game Science. Project areas included analyzing data on problem-solving strategies, implementing educational games and tutoring systems, and creating game design tools.

**Pre-Doctoral Instructor, Computer Science & Engineering, University of Washington** ..... 2014 and 2016

Taught *Intermediate Programming Concepts & Tools:* bash shell, git, C programming, and memory management (winter 2016) and *Data Structures & Algorithms:* upper-level course in data structures and algorithms, including asymptotic analysis, proof by induction, and concurrency (winter 2014).

**Software Development Engineer in Test Intern, Microsoft** ..... 2013

Implemented a frontend for a memory diagnostic tool in Visual Studio using JavaScript and C#.

## Education

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**University of Washington, Ph.D. Computer Science** ..... 2019

*Thesis:* Understanding Problem Solving and Collaboration in Open-Ended Environments

**University of Washington, M.Sc. Computer Science** ..... 2013

*Qualifying Project:* Automated Redesign of Local Playspace Properties

*Coursework:* Algorithms, Programming Languages, Computer Systems, Software Engineering, Principles of DBMS, Artificial Intelligence, Advanced Human-Computer Interaction, Computer Graphics, Data Visualization

**Williams College, B.A. Computer Science (magna cum laude)** ..... 2011

## Technical Skills

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Python, C, Java, SQL, Rust, Go, C++, JavaScript, HTML/CSS, React, Flask, Docker, PostgreSQL, scikit-learn, Git, Unix