Sean L. Snaider

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EDUCATION

Northeastern University   **Boston, Massachusetts**
B.S. in Computer Science   *Expected Graduation, May 2028*
- o **Concentration:** Software Engineering
- o **GPA:** 3.93/4.00, *Dean's List*
- o **Related Coursework:** Computer Systems, Algorithms and Data Structures, Fundamentals of Computer Science 1, Fundamentals of Computer Science 2, Object-Oriented Design, Introduction to Databases, Theory of Computation

SKILLS

Languages: Python, Java, C, x86-64 Assembly, SQL, JavaScript, TypeScript
Frameworks & Libraries: React, Tailwind CSS, Zustand, Web Audio API, Pandas, NumPy, Matplotlib, PyGame, Java Swing, FUSE
Tools & Platforms: Git, Linux/WSL, Docker, GDB, Vite, JUnit, Unittest, VS Code, IntelliJ IDEA, Claude AI, GitHub Copilot

EXPERIENCE

Khoury College of Computer Sciences, Northeastern University   **Boston, Massachusetts**
TA for Program Design and Implementation 1 (Fall '25) & 2 (Spring '26)   *Sep 2025 - Present*
- Diagnose and resolve Python and Java bugs for **30+ students weekly** across two **400+ student** courses, targeting issues in list comprehensions, class hierarchies, and data structures to reduce repeated office hour visits by an estimated **25%**
- Coach systematic debugging practices including breakpoint usage, test isolation, and fault localization, enabling students to independently resolve issues rather than relying on line-by-line code review
- Co-develop curriculum integrating agentic AI tools (Claude, Copilot) into assignments, conducting research to measure AI-assisted coding's impact on student debugging skills and learning outcomes
- Evaluated **6 agentic AI platforms** (Cursor, Claude Code, Copilot, Gemini, Warp, Aider) for new AI literacy lab, selecting tools that balance development speed with code comprehension for **400+ students**

PROJECTS

Guitar Learning Tool *- React, TypeScript, Zustand, Web Audio API, Tailwind*   *Dec 2025 - Present*
- Engineered real-time audio synthesis using Web Audio API oscillators with ADSR envelope shaping, achieving **<10ms** latency for responsive note playback across a **144-position** interactive fretboard
- Built comprehensive scale library covering **40+ patterns** (modes, pentatonics, jazz, exotic) with CAGED and 3-note-per-string systems, persisting user progress via Zustand with localStorage
- Designed three practice modes (note identification, sequence drills, interval training) with adaptive difficulty scaling from open position to full neck mastery

Sanguine - *Java, JUnit, Java Swing*   *Nov 2025 - Dec 2025*
- Architected pub-sub event system in Java Swing synchronizing two-player game state in real time, eliminating UI lag and ensuring consistent move rendering across clients
- Designed pluggable AI strategy system using Java interfaces enabling runtime difficulty selection without code modification, demonstrating polymorphism and Strategy pattern mastery
- Maintained **90%+ code coverage** across model and strategy components using JUnit mock objects, catching edge cases in controller, strategy, and model layers

Rubik's Cube Solver and Teaching Tool - *Python, PyGame*   *Oct 2025 - Jan 2026*
- Implemented Kociemba two-phase algorithm computing near-optimal solutions **(≤20 moves)** in **<1 second**, rendered in real-time 3D simulator built with PyGame
- Created step-by-step teaching mode with state validation blocking progression until each stage (cross, corners, second layer, top face) is completed correctly

File System - *C, FUSE*   *Nov 2025 - Dec 2025*
- Developed FUSE driver mounting 1MB disk image as persistent filesystem supporting **128 files/directories** with inode-based storage, free-space bitmaps, and nested directory structures
- Achieved full Unix command compatibility (ls, cat, rm, mkdir) by implementing POSIX syscalls via memory-mapped I/O, demonstrating systems programming proficiency