Theo Kroening

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EDUCATION

Carnegie Mellon University May 2025
Bachelor of Science, Computer Science *Pittsburgh, PA*

- *Selected Coursework*: Computer Systems, Parallel Data Structures and Algorithms, Algorithm Design, AI, Computer Security, Programming Languages
- *Current Coursework*: Compiler Design, Software Engineering, Automated Program Verification
- *Planned Concentration*: Computer Systems
- Dean's List Spring 2023

EXPERIENCE

School of Computer Science, Carnegie Mellon University August 2023 - December 2023
Teaching Assistant - 15-213 (Introduction to Computer Systems) *Pittsburgh, PA*

- TA for CMU's *Introduction to Computer Systems* Course (15–213). Held weekly recitations and office hours to help students strengthen their understanding of systems programming concepts, including:
  - Reasoning about x86 assembly, and tracing its execution with `gdb` (GNU Debugger), with a special focus on how to exploit and guard against security vulnerabilities in this assembly.
  - Writing a dynamic memory allocator (`malloc`) and virtual memory.
  - Process and thread-level programming, including signals and concurrency. Applied in the context of shells and network programming.

School of Computer Science, Carnegie Mellon University January 2022 - August 2023
Teaching Assistant - 15-112 (Fundamentals of Programming and Computer Science) *Pittsburgh, PA*

- TA for CMU's introductory programming course (15–112). The course is taught in Python.
- Held weekly recitations and office hours to help students with coursework and strengthen conceptual understanding.
- Mentored over 40 students through their final Python programming projects. Advised students on code organization and style, as well as how to solve problems in their projects with algorithms. Algorithms include:
  - Maze generation algorithms (DFS, Hunt and Kill), MST algorithms (Kruskal's, Prim's)
  - Pathfinding algorithms (DFS, BFS, Dijkstra's)
  - Network programming with Flask and requests.
- Two of my mentees were selected to appear in the course's Term Project Showcase, which highlights a selection of the most impressive projects.

PROJECTS

Wean 9 Fall 2021
15-112 Term Project *Pittsburgh, PA*

- Implemented a 2000-line game in Python and `tkinter`, making heavy use of OOP. The project was selected from several hundred others as the winner of the Term Project showcase by popular vote.

Dragonfly 2021
High School Term Project *Oxford, England*

- Designed and developed a learning platform for students, interviewing both students and teachers to determine program features and objectives.
- Implemented a robust backend with Python Flask and SQL, together with a fully-featured web application written in vanilla Javascript.

TECHNICAL SKILLS

Computer Languages	Python, C, C++, Javascript, SML, SQL, HTML, CSS
Protocols & APIs	XML, JSON, AJAX
Tools	Vim, LaTeX, Git/GitHub, gdb