Kellen Sun

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› SKILLS

- **Languages:** Python, JavaScript, C/C++, Rust, Scheme/Racket, HTML/CSS, Haskell, SQL.
- **Frameworks and Libraries:** Flask, Node.js, React.js, MongoDB, NumPy, PyTorch, TensorFlow, Matplotlib, Django, pandas.
- **Software and Dev Tools:** GitHub, Git, VSCode, Docker, LaTeX, Linux, Bash.

› PROJECTS

Exploring AI & Chess Transformer, Dec 2023 - Jan 2024

- Used **semantic search** to find files based on text matches from vector embeddings using the BERT sentence tranformer.
- Trained a handwritten digit **classification model** from scratch using gradient descent in **Python** achieving a **94%** accuracy.
- Constructed a bigram language model with self-attention (2M parameters) in **PyTorch** to generate Shakespeare and custom Discord messages by implementing the Transformer architecture thus learning about current advances in LLMs and **AI/ML**.
- Implemented alpha-beta pruning and minimax for a **chess bot** and scaled a (21.4M parameters) chess transfomer and **tokenizer** based on this paper.

OpenBias, Hack the 6ix, Aug 2023

- Developed a **MERN** web app and Chrome Extension (HTML/CSS/JS) to crowdsource bias in the news over a 36-hour hackathon.
- Built **RESTful** APIs in **Express.js/MongoDB** backend and tested **CRUD** API endpoints.
- Filtered articles using **Google Cloud NLP** to determine the relevance of articles based on **sentiment analysis** of content and warn users of potential bias.

PokerEngine Nov 2023 - Ongoing

- Designed a poker engine to autonomously host competitions between poker bots submitted to a web server using **Docker**.
- Drafted an executor file in **Rust** to enforce game rules through a custom protocol.

Memoir, UofTHacks, Jan 2024

- Developed a social media app with account creation, user authentication and posting features using **Auth0**.
- Used **MongoDB Atlas** to store post information securely and **React.js** for an interactive front end.
- Created graphs from posts by semantic analysis using NLP from **Cohere** and BIRCH Clustering algorithm from **scikit-learn** and used **D3.js** to visualize clusters.

› EXPERIENCE

Logiscool, Ottawa, Ontario
Coding Instructor Jul 2022 - Feb 2023

- Leveraged strong technical proficiency to **tutor Python** data structures and control flow in imperative programming.
- Facilitated learning in various formats including EV3 robotics, Roblox Game Design, Minecraft Redstone and block-based coding by employing effective communication to make concepts understandable.
- Provided attentive supervision and mentorship to children thus creating a safe and inclusive learning environment.

Introduction to Geometry, Ottawa, Ontario
Co-Founder Jul 2022 - Sep 2022

- Founded an organization for math and computing contest preparation cultivating a collaborative learning environment.
- Designed from scratch and instructed a 12-hour long geometry course with lecture slides, problems and homework.

› EDUCATION

University of Waterloo, Waterloo, Ontario — September 2023 — Present
BCS, Honours Computer Science with Co-op — Faculty Average: **95.2**
National Math Scholarship, and President's Scholarship of Distinction ($17.5k) — Cumulative Average: **93.6**

Relevant Courses:

- Designing Functional Programs (Advanced) & Elementary Algorithm Design and Data Abstraction (Advanced):
  - » Applied functional programming concepts with lambda calculus to abstract data structures and analyze time complexity.
  - » Created an interpreter, compiler and assembler in **Racket** while developing an imperative model of computation.
- Tools and Techniques for Software Development:
  - » Learned about Linux, VSCode and Git. Wrote **Bash** scripts to automate compiling and testing code.
- Object-Oriented Software Development, Logic and Computation, Linear Algebra 2 (Advanced).

Awards:

- Canadian Open Math Challenge (Top 1%)
- Canadian Computing Competition (Senior) Honour Roll
- Leetcode Top 2%

High School: Math Club President (2021-2023), Schulich Leader Nominee