Brayden Carlson

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Summary

A versatile software developer proficient in multiple programming languages, database systems, and artificial intelligence technologies. Skilled in delivering impactful solutions through custom software development, data migration, and research frameworks. Combines deep technical expertise with strong communication abilities to effectively translate stakeholder requirements into meaningful business outcomes.

Education

Bachelor of Science, Computer Science September 2020 – May 2024
University of Lethbridge, Lethbridge, Alberta

- **GPA:** 3.86/4.00
- "With Great Distinction" designation
- "Honours Thesis" designation

Diploma, Digital Media and IT September 2015 – May 2017
Northern Alberta Institute of Technology, Edmonton, Alberta

Experience

Intermediate Software Developer June 2024 – Present
Stratus Advanced Technologies, Lethbridge, Alberta

- Developed internal tooling and standardized development practices, resulting in an estimated $50,000 in annual savings as suggested by the CEO, through reduced development time, faster onboarding, and elimination of redundant processes.
- Acted as the sole developer tasked with cleaning, consolidating, and migrating data from four separate MySQL databases into a unified SAP database using Python and pandas DataFrames, while preserving data integrity and maintaining minimal disruption to business operations throughout the transition.
- Designed and implemented a tailored Computerized Maintenance Management System (CMMS) with a small team, replacing legacy third-party software with a modern solution, while collaborating with stakeholders to gather requirements, deliver progress updates, and align solutions with business objectives.
- Provided technical guidance to fellow developers through structured code reviews and teambuilding meetings, while managing project workflow via Jira issue creation, assignment, and prioritization to maintain consistent delivery.
- Designed and built web and mobile applications with intuitive interfaces using Python, Django, Alpine.js, PostgreSQL, Bootstrap, and HTML/CSS, and integrated artificial intelligence into software solutions, such as using Large Language Models (LLMs) and Speech-to-Text (STT) technologies.

Research Assistant, Tata Lab May 2023 – May 2024
University of Lethbridge, Lethbridge, Alberta

- Conducted in-depth research on the cocktail party problem – an issue within computer science, cognitive psychology, and neuroscience – aiming to develop an effective algorithm to separate overlapping acoustic signals into individual sources.
- Assisted in the development of a neural network and machine learning model to perform speech-to-text or phoneme classification on isolated signals, including determining optimal settings, parameters, and the appropriate neural network architecture.
- Developed a research framework and data pipeline for exploring the relationship between pupillometry and the autonomous nervous system using specialized hardware.
- Facilitated collaboration and version control using GitHub, and maintaining efficient and improved communication among team members.

Acoustic Analysis in Python, The Birdsong Lab January 2022 – June 2023
University of Lethbridge, Lethbridge, Alberta

- Designed and created a graphical user interface for a dynamic thresholding segmentation algorithm to include or exclude animal vocalizations based on a set of parameters.
- Implemented a pipeline to analyze, filter and segment 1100 Adelaide's warbler's songs into individual notes.
- Created several interactive 2D and 3D plots using the Uniform Manifold Approximation and Projection for Dimension Reduction (UMAP) algorithm, and clustered notes using Hierarchical Density-Based Spatial Clustering of Applications with Noise (HDBSCAN) and Fuzzy C-Means clustering algorithms.
- Prepared, collaborated, and participated in meetings; presented information, images and data, received feedback, discussed current progress, and planned for weekly deadlines.

Conferences

1. Huang, S. Y., **Carlson, B. L.**, Mower, P. C., & Logue, D. M. (2023, October 31). Characterizing structural variation in the notes of Adelaide's warbler (Setophaga adelaidae) songs [Session talk]. *International Bioacoustics Congress 2023, Sapporo, Japan.*

2. Martens, T., De Sousa Costa, A., **Carlson, B. L.**, & Tata, M. S. (2023, August 17). Using artificial neural networks (ANNs) with acoustic reverberation to classify room size [Poster]. *Undergraduate Research Showcase 2023, Lethbridge, AB, Canada*

3. Huang, S. Y., **Carlson, B. L.**, Mower, P. C., & Logue, D. M. (2023, July 12). Using automated classification to build a note library of Adelaide's warbler songs [Session talk]. *Animal Behavior Society 2023, Portland, OR.*

4. Huang, S. Y., **Carlson, B. L.**, Mower, P. C., & Logue, D. M. (2023, March 25). Using AI to build a note library of Adelaide's warbler songs [Session talk]. *Meeting of the Minds 2023, Lethbridge, AB, Canada.*

5. Huang, S. Y., **Carlson, B. L.**, Mower, P. C., & Logue, D. M. (2023, February 9). Using AI to build a note library of Adelaide's warbler songs [Poster]. *Women in STEM Conference 2023, Lethbridge, AB, Canada*

Highlights and Skills

- **Languages and frameworks:** Python, Go, Rust, and C++
- **GUIs and UIs:** Qt, Fyne, wxWidgets, Slint, egui, Sass, Tailwind, and Bootstrap
- **Databases:** PostgreSQL, MySQL, and Redis.
- **File formats and data storages:** pandas DataFrames, JSON, XML, INI, and Apache Parquet.
- **Operating systems and other technologies:** Windows, Linux, single-board computers, virtualization, remote desktop, automation, SSH, and FTP.
- **Technology and software:** Docker, Jira, Confluence, Git, GitHub/GitLab, Windows API, LaTeX, and UML.
- **Media software:** Adobe suite applications including Photoshop, Illustrator, InDesign, Lightroom, and Animate.
- **General software:** Microsoft Office suite applications including Word, PowerPoint, and Excel.
- **Clean Class 5 (Non-GDL) License**

Scholarships and Awards

- **Arts and Science Gold Medal Nominee** 2024
- **Dean's List** 2020 – 2022, 2024
- **Jason Lang Scholarship** 2021 – 2023
- **University of Lethbridge Scholarship** 2022 – 2023

Volunteering and Mentoring

Git and GitHub Workshop, The Birdsong Lab April 2022
University of Lethbridge, Lethbridge, Alberta

- Designed and delivered tailored Git and GitHub training for The Birdsong Lab at the University of Lethbridge.
- Created a user-friendly lab manual including step-by-step instructions and troubleshooting tips.
- Conducted hands-on exercises, and real-world examples to reinforce concepts.
- Provided ongoing support and guidance for lab members' Git and GitHub adoption.

Microbial Characterization, Independent Study January 2021 – May 2021
University of Lethbridge, Lethbridge, Alberta

- Designed, tested, and integrated a cross-platform graphical user interface for a native experience on Windows, macOS and Linux using wxWidgets in C++ for software that updated and generated reference gene databases from NCBI GenBank data.
- Planned, communicated and collaborated with a fellow computer science student on the goals, objectives and specifications of the project as required by the principal investigator and graduate student.
- Organized and modularized an existing codebase for sustainability and maintainability, formatted comments for consistency, and wrote documentation for the compilation process of the software.