D. Estes McKnight

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Motivated software engineer with 3 years of ML research and cross-stack experience. Eager to leverage skills in Python, SQL, PyTorch, and more to drive innovative financial technology solutions.

EDUCATION

University of Alberta   2019–2022

    M.Sc. Computer Science research-based, *GPA 4.0*

    Research in NLP and machine learning with Prof. Alona Fyshe's Representations Lab

University of Oklahoma   2014–2019

    B.S. Mathematics *magna cum laude*

    B.S. Computer Engineering *GPA 3.7*, with **Minor in Computer Science**

EMPLOYMENT

University of Alberta . . . . Edmonton, Alberta
Research Associate   Jan 2023–Jan 2024
Graduate Research Assistant   Apr 2020–Oct 2022

- Machine learning & NLP research. Published & presented papers, including at the NLP-top-3-venue NAACL
- Designed/analyzed models with Python, PyTorch, pandas, and SciPy. Trained hundreds on multimillion-scale datasets with Docker, SLURM, and cloud clusters. Indexed data using ElasticSearch.
- Used Python, Flask, JavaScript, HTML, and CSS to design response-annotation webpages on GCP

Graduate Teaching Assistant   Aug 2019–Apr 2020

MiTek USA, Inc. . . . . St. Louis, Missouri
Backend Software Engineering Intern   May–Aug 2018

- Refactored SQL CRUD tests with C# and mocked with NSubstitute to eliminate dependencies

Frontend Software Engineering Intern   May–Aug 2017

- Used C#, WPF, and Entity Framework to create an incident report-editing application that interfaced with the company's e-mail databases. Application part of manager's workflow a year later

Iowa State University VR Application Center . . . . Ames, Iowa
Research Intern   May–Aug 2016

- Created a simulation for the U.S. military in Unity with C# as part of an Intelligent Team Tutoring project.

CONTRACT WORK

Ballpark Housing . . . . Edmonton, Alberta
Backend/NLP Development   May–Jul 2024

- Collaborated to design an LLM-based RAG system using Pinecone and OpenAI's GPT-4. Prepared a scraping server and PostgreSQL database on GCP using SQLAlchemy.

Alberta Machine Intelligence Institute . . . . Edmonton, Alberta
ML Educational Material Development   Jun–Aug 2023

LANGUAGES AND TECHNOLOGIES

Languages	Proficient in *Python*, *Java*, *C++*, *C#*, & *SQL*. Familiar with *R*, *MATLAB*, *JavaScript*, & *Bash*
SWE	Version Control (*Git*, *TFS*), CI/CD (*GH Actions*), Containerization (*Docker*), ORM (*SQLAlchemy*, *Ent. Framework*), Tests (*PyTest/NUnit*), REST (*FastAPI*) MVX (*WPF, Swing*), Cloud (*GCP*)
ML/Data Sci.	*PyTorch*, *Pandas*, *sklearn*, *NumPy*, *XGBoost*, *Elasticsearch*, 🤗 *transformers*, *Pinecone* & *wandb*

SELECTED PROJECTS

- Developed a **Python** bitfield/serialization library for ROM-hacking with **CI/CD**, **PyTest**, and **Sphinx docs**
- Created a **GCP**-hosted self-updating website to track statistics for a multi-month 1500-vote **video-game music contest** using a **LASPy** (**Debian**, **Apache**, **SQLite**, and **Python**) stack and BeautifulSoup4
- Worked with a cross-Canada team to discover online depressive language trends during COVID-19 in various cities. Used **ElasticSearch**, **GloVe** and **VADER** on scraped geocoded tweets and Reddit posts. Wrote **bash/Python scripts** for others to collect additional data

LEADERSHIP

- **President** of **UAlberta's Computing Science Graduate Students' Association** (Sum. 2021–Sum. 2022)
- **President** of **UOklahoma's Math Club** (Fall 2016–Spring 2019), VP (Spring 2016), Treasurer (Fall 2015)
- **Captain** of **UOklahoma's ACM-ICPC Programming Competition Club** (Fall 2017–Spring 2019)

PUBLICATIONS

Forthcoming

- **McKnight** et al. "Adult age and object-similarity judgment: Differences between 25–35- and 50–60-year-olds concerning interpretable neural-embedding dimensions".

- **McKnight** & Fyshe "Taxonomic–thematic preference differences between adults and young children through sparse object-similarity embeddings".

Published

- **McKnight** & Fyshe. "Characterizing Human and Zero-Shot GPT-3.5 Object-Similarity Judgment". *Find. 2024 Conference of the North American Chapter of the Association for Computational Linguistics (NAACL)*, 2024.
  https://demcknight.com/served_files/919-characterizing-human-and-zero.pdf

- **McKnight**. "Age-Related Differences in Object-Similarity Judgment". Master's thesis, The University of Alberta, 2022.
  https://doi.org/10.7939/r3-mz1n-v607

- Davis, **McKnight**, et al. "Quantifying Depression-Related Language on Social Media During the COVID-19 Pandemic". *International Journal of Population Data Science (IJPDS)*, 2020.
  https://doi.org/10.23889/ijpds.v5i4.1716

- Stewart, Epstein, Troup, **McKnight**. "A Mathematician's Deliberation in Reaching the Formal World and Students' Views of the Eigentheory". *Proc. 11th Congress of the European Society for Research in Mathematics Education (CERME)*, 2019.
  https://hal.science/hal-02459875/

- Stewart, Epstein, Troup, **McKnight**. "An Analysis of a Mathematician's Reflections on Teaching Eigenvalues and Eigenvectors: Moving between Embodied, Symbolic and Formal Worlds of Mathematical Thinking". *Proc. 22nd Annual Conference on Research in Undergraduate Mathematics Education (RUME)*, 2019.
  http://sigmaa.maa.org/rume/crume2019/Papers/147.pdf