KEVIN KRAHN

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PROFILE

Computer science student with research interests in natural language processing, computational linguistics, machine learning, and computer graphics. Undergraduate research involved the application of transformer language models to the study of Ancient Greek texts.

EDUCATION

08/2020 - 05/2023 **Bachelor of Science in Computer Science** (*Summa cum laude*)
Sattler College | Boston, Massachusetts

01/2017 - 12/2019 **Ontario College Advanced Diploma: Computer Programmer Analyst**
Fanshawe College | London, Ontario

WORK EXPERIENCE

08/2023 - Present **Teaching Assistant** | Sattler College, Boston
Assisted teaching, preparing course materials, and grading for *CS422 - Machine Learning.*

08/2022 - 05/2023 **Computer Science Tutor (Work Study)** | Sattler College, Boston
Tutored underclassmen with computer science coursework.

08/2022 - 05/2023 **Resident Assistant (RA)** | Sattler College, Boston
Supervised and assisted residents, organized events, and mediated between staff and students.

01/2021 - 05/2023 **Mobile App Developer (Work Study)** | Sattler College, Boston
Developed Android & iOS app called Journey Groups, now being used by students.

01/2018 - 12/2020 **Junior Software Developer** | Cineplex Digital Media, London, Ontario
Developed software for controlling digital displays via serial and TCP protocols; maintained custom Linux distribution for embedded systems. Began as co-op position; switched to full-time after graduation.

PUBLICATIONS, PEER REVIEWED

- Frederick Riemenschneider* and **Kevin Krahn***. 2024. *Enhancing Low-Resource Language Analysis With Character-Aware Hierarchical Transformers: SIGTYP 2024 Shared Task*, in *Proceedings of the The 6th Workshop on Research in Computational Linguistic Typology and Multilingual NLP.* (forthcoming)

  Implemented hierarchical transformer architecture for enhanced performance on 13 low-resource historical languages.

- **Kevin Krahn**, Derrick Tate, and Andrew C. Lamicela. 2023. *Sentence Embedding Models for Ancient Greek Using Multilingual Knowledge Distillation*. In *Proceedings of the Ancient Language Processing Workshop associated with RANLP-2023,* pages 13–22. | [**Paper**] [**Online Demo**]

  Trained language models for Ancient Greek utilizing knowledge distillation and cross-lingual transfer from modern languages; compiled parallel training data with translation alignment; developed new evaluation datasets.

Conferences Attended

- RANLP-2023 | *Recent Advances in Natural Language Processing*, Varna, Bulgaria | 09/2023
  Gave oral presentation at *First Workshop on Ancient Language Processing (ALP).*
- ACL-2023 | *The 61st Annual Meeting of the Association for Computational Linguistics*, Toronto, Canada | 07/2023

Skills

- *Developer Tools:* Linux environments, SSH, Docker, Git, Bash, Jupyter, PyTorch, Numpy
- *Programming Languages:* C++, Python, Javascript, Go, Rust
- *Web Development:* HTML, CSS, WebGL, React, Svelte, Node.js
- *Computer graphics:* GLSL, OpenGL, Vulkan
- *Natural languages:* English (native), Ancient Greek (3 years), Ancient Hebrew (2 years)

Selected Projects

- **Ζήτησις - Semantic Search for Ancient Texts**
  Online tool for searching the Ancient Greek corpus with English queries. | [**Website**]
- **Char to Word DeBERTa**
  Expanded DeBERTa model with hierarchical architecture for unlimited vocabulary. | [**GitHub**]
- **Machine Translation for Ancient Greek**
  Fine-tuned multilingual-T5 model for translation of Ancient Greek to English. | [**Website**]
- **Ray Tracer**
  Implemented multithreaded ray tracer from scratch in Rust. | [**GitHub**]
- **3D Renderer + Game Engine**
  Developed game engine and renderer in C++ and OpenGL, now open source. | [**GitHub**]
- ***One2Three***
  Developed puzzle game for Android with LibGDX (Java) and published on Google Play. | [**Google Play**]

Awards & Honors

- Sattler College: *President's List* (all semesters)
- Fanshawe College: *President's Honor Roll, Dean's Honor Roll* (all semesters)
- Fanshawe College: *2020 Information Technology Academic Achievement Award*
  Awarded for achieving the highest cumulative GPA in a final year of the program.
- Fanshawe College: *2020 Dean's Academic Award*
  Awarded for achieving the highest academic standing in the Faculty upon completion of diploma.
- Fanshawe College: *Info-Tech Research Group Academic Excellence Award Computer Programmer Analyst*
  Awarded for achieving the highest GPA upon completion of year 1.