

Dawn E. McKnight

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EDUCATION

- University of Alberta 2019-2022
M.Sc. Computer Science research-based, *GPA 4.0*
Research in NLP and machine learning under Dr. Alona Fyshe
Best thesis nominee: "Age Differences in Similarity Judgment through Neural Embeddings"
- University of Oklahoma 2014-2019
B.S. Mathematics *magna cum laude*
B.S. Computer Engineering *GPA 3.7*, with **Minor in Computer Science**
Undergraduate research in linear algebra pedagogy under Dr. Sepideh Stewart

EMPLOYMENT

- University of Alberta** **Edmonton, Alberta**
ML/NLP Graduate Research - RA Fellowship & TA Fall 2019-Fall 2022
- Machine learning and natural language processing research using Python, pytorch, machine learning, neural embeddings, word vectors, data analysis, statistical testing, data scraping, and sentiment analysis
 - TA for CMPUT 566 Machine Learning; 272 Discrete Maths; 355 Games, Puzzles, Algorithms
- MiTek USA, Inc.** **St. Louis, Missouri**
Software Engineer Summers 2017, 2018
- Developed an incident report-viewing/editing application using C#, WPF, and Entity Framework, still in use by the company the following year
 - Refactored (C#) unit tests and mocked with NSubstitute to eliminate dependencies and database reliance
- Iowa State University VR Application Center** **Ames, Iowa**
Research Intern Summer 2016
- Created a military simulation for the U.S. Army in Unity with C# as part of an Intelligent Team Tutoring project. Designed 3D models with Blender and AutoCAD

LANGUAGES AND TECHNOLOGIES

- Proficient in *Java*, *C++*, *C#*, and *Python*. Familiar with *MATLAB*, *Mathematica*, *JavaScript*, *LaTeX*, and *Bash*
- Uses paradigms and tools such as *Torch/PyTorch*, *Keras*, *Git*, *TFS*, *JavaDoc*, *Doxygen*, and *UML*

SELECTED PROJECTS

- Created a novel algorithm to determine differences between younger and older adults in performing object-similarity judgment using **machine learning** and an **interpretable neural network embedding**
- Examined the effects of the COVID-19 pandemic on online discourse using **natural language processing** and **sentiment analysis**
- Implemented a priorly-untried method for classifying butterflies via **neural nets & topological data analysis**
- Developed a program in **C++** to construct 3D-printable triangular mesh approximations from continuous real bivariate functions. Sped up processing via parallelization with **CUDA**
- Animated a winter night sky scene using fractals (IFS, Koch, and n-flake) and **OpenGL/JOGL**

EXPERIENCE AND AWARDS

- Master's thesis nominated for **Best Department Thesis** by the defence committee
- President of UAlberta's Computing Science Graduate Students' Association** (Fall 2021-)
- President of OU's Math Club** (Fall 2016-Spring 2019), Vice President (Spring 2016), Treasurer (Fall 2015)
- Captain of OU's ACM-ICPC Programming Competition Club** (Fall 2017-Spring 2019)
- OU Presidential Honor Roll** (Fall 2015, Spring 2017, Spring 2018, Spring 2019), **OU Dean's Honor Roll** (all semesters but Fall 2018)

PUBLICATIONS

- “Adult age and object-similarity judgment: Differences between 25–35- and 50–60-year-olds concerning interpretable neural-embedding dimensions”. Forthcoming, 2023.
- “Taxonomic–thematic preference differences between adults and young children through object-similarity neural embeddings”. Forthcoming, 2023.
- “Age-Related Differences in Object-Similarity Judgment”. Master’s thesis, The University of Alberta, 2022. <https://era.library.ualberta.ca/items/1b3e4006-c1dc-4aaa-864a-3fe8be783c5f>
- “Quantifying Depression-Related Language on Social Media During the COVID-19 Pandemic”. *International Journal of Population Data Science*, 2020. <https://doi.org/10.23889/ijpds.v5i4.1716>
- “A Mathematician’s Deliberation in Reaching the Formal World and Students’ Views of the Eigentheory”. *The 11th Congress of the European Society for Research in Mathematics Education*, 2019. <https://hal.science/hal-02459875/>
- “An Analysis of a Mathematician’s Reflections on Teaching Eigenvalues and Eigenvectors: Moving between Embodied, Symbolic and Formal Worlds of Mathematical Thinking”. *The 22nd SIGMAA on Research in Undergraduate Mathematics Education Conference*, 2019. <http://sigmaa.maa.org/rume/crume2019/Papers/147.pdf>
- “The Development of Interactive Applications to Assist with a Linear Algebraic Curriculum”. Undergraduate honors thesis, the University of Oklahoma, 2019. <https://dem1995.github.io/files/McKnightHC-LAApps.pdf?raw=true>