Alexander Martin

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EDUCATION

University of Rochester — **Rochester, New York**
Bachelor of Science, Computer Science; — *Anticipated May 2024*
Honors in Research

RESEARCH EXPERIENCE

FACTS Lab (http://factslab.io/) — ***Rochester, New York***
Research Assistant — ***May 2022 – Present***

FAMuS: Frames Across Multiple Sentences (Middle Author):

- Constructed a corpus consisting of ~800 FrameNet frames to facilitate supervised learning of broad-coverage document level role extraction models.
- Created custom IAA metrics and F-scores to calculate annotator agreement with gold annotations, reducing number of annotators by 86.5% and increasing average accuracy by 40%.
- Coordinated Amazon Mechanical Turk launches for 3 stages of annotator selection.

Independent Research

Relative Importance Analysis of PFAS Exposure on Bone Mineral Density (Middle Author): — ***May 2022 – Present***
Environmental Protection Agency

- Developed algorithms and MATLAB code for QR factorization based on Householder, Gram-Schmidt, Givens Rotation, and Singular Value Decomposition.
- Produced results on large-scale matrices measuring the effect of Per and Polyfluorinated Alkyl Substances (PFAS) exposure on bone mineral density.

A Complicated Probability Problem (1st Author): — ***September 2022 – Present***

- Derived a method to calculate the probability of n hits where the n^i hit is after the n^{i-1} hit and summed the probabilities reducing the range of the summation after every instance of a hit.
- Vectorized the method to produce 'infinite' probability sums in shorter time by using GPU resources.

Image-to-Image Translation Across Large Domain Gaps (1st Author): — ***July 2022 – Present***
Advised by Jiebo Luo, University of Rochester

- Built computer vision model to perform image-to-image translation for paired images with large domain gaps

PROJECTS

Applied Instance Segmentation
Machine Vision

- Engineered a platform to automate visual home inspections, using a computer vision model with instance segmentation modifying Mask R-CNN that identifies common problems discovered during inspections.
- Received the "Make it Happen" Grant from the University of Rochester.

LEADERSHIP ACTIVITIES

University of Rochester, Computer Science Department — **Rochester, New York**
Teaching Assistant – Data Structures and Algorithms (CSC 172) — *Spring 2022, Fall 2022*
Workshop Leader – Intro to Computer Science (CSC 171) — *Fall 2021*
Math and Computer Science Tutor — *Feb 2021 – May 2022*
Computer Science Undergraduate Council: Internal Communications Chair — *Feb 2021 – May 2022*

University of Rochester, Residential Life — **Rochester, New York**
Resident Advisor (RA) — *Aug 2022 – Present*
D'Lion (First Year Staff) — *Aug 2021 – May 2022*

University of Rochester, Clubs and Activities — **Rochester, New York**
STEM Initiative: Education Mentor — *Feb 2021 – Present*
Men's Ice Hockey: Assistant Captain — *August 2020 – Present*

SKILLS

Programming languages: Python (PyTorch, TensorFlow), Java, C, SQL, MATLAB, HTML/CSS, JavaScript, R, Kotlin
Other: GIT, Raspberry Pi, Android Studio, LaTeX, MongoDB, Notebooks, Amazon Mechanical Turk, AWS Shell
Courses: NLP w/ Classification and Vector Spaces
Interests: World Record Holder, NLP, NLU, machine vision, long duration autonomy, efficiency, ML math, hiking