Michelle Qiu

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Education

Duke University August 2021 - May 2025

B.S. in Computer Science, B.A. in Sociology, minor in Mathematics; GPA: 3.957 *Durham, NC*

- Graduate level coursework: Theory and Algorithms of Machine Learning, Computer Vision, Deep Learning
- Other relevant coursework: Artificial Intelligence, Natural Language Processing, Design and Analysis of Algorithms, Linear Algebra, Multivariable Calculus, Probability, Real Analysis, Statistical Inference

Publications

Agnew, E*, **Qiu, M.***, Zhu, L.*, Wiseman, S., & Rudin, C. (2023, July). The Mechanical Bard: An Interpretable Machine Learning Approach to Shakespearean Sonnet Generation. In Proceedings of the 61st Annual Meeting of the Association for Computational Linguistics (Volume 2: Short Papers) (pp. 1627-1638). *Outstanding Paper Award.*

Research

Bot or Not: Social Turing Test March 2024 - Present

Polarization Lab (Duke University) *Durham, NC*

- Analyze whether knowingly sharing social identities such as partisanship, race, and/or gender impacts social media users' perception of other accounts on a social media platform as botlike or not, in collaboration with Dr. Christopher Bail, Dr. Sunshine Hillygus, and Dr. Alex Volfovsky.
- Generated social media posts by prompt engineering a pretrained large language model (LLM) and created a Qualtrics survey to evaluate the perceived partisanship of generated content using Connect CloudResearch crowdworkers.
- Programmed a static Qualtrics survey using a combination of human- and LLM-generated social media posts and comments to test respondents' ability to identify bot-generated versus human generated content, using advanced Javascripting to embed data and preserve randomness of treatment.
- Evaluate our research question using a lab-developed simulated social media platform to emulate a user's experience on a social media site, using real-time LLM-generated content.

Interpretable Natural Language Processing for Meniere's Disease September 2023 - Present

Interpretable Machine Learning Lab (Duke University) *Durham, NC*

- Develop interpretable text analysis process for patient note data to better diagnose patients with Meniere's Disease, a commonly misdiagnosed debilitating illness, under the supervision of Dr. Cynthia Rudin and Dr. David Kaylie.
- Compose programs in GATE (Generalized Architecture for Text Engineering) to tokenize electronic health record data, extract text markers for various symptoms associated with this disease, and implement a decision tree based on extracted symptoms to predict a diagnosis.
- Collaborate with surgeons from the Department of Head and Neck Surgery at Duke University to refine symptom identification methods and obtain a preliminary proposed diagnosis decision tree.
- Algorithmically identify the presence of markers of improvements in quality of life and symptom prevalence for patients who receive endolymphatic sac decompression to understand the efficacy of this particular surgical treatment.

The Mechanical Bard March 2022 - July 2023

Interpretable Machine Learning Lab (Duke University) *Durham, NC*

- Generated realistic Shakespearean sonnets with an algorithm incorporating both line templating and a pretrained LLM (GPT-2) finetuned on a corpus of sonnets, under the supervision of Dr. Cynthia Rudin and Dr. Sam Wiseman.
- Utilized a modified beam search algorithm to optimally fill line templates with words generated with the LLM, using a rhyming dictionary and known part-of-speech tags to ensure grammatical correctness and adherence to sonnet constraints, as well as weighting for poetic characteristics like alliteration, repetition, and other figurative language to increase creative output.
- Evaluated the quality of our system's generated poems against comparable sonnet generation algorithms, ablative versions of our model, and true human-written sonnets using Amazon MTurk crowdworkers and expert faculty/students at an academic English department.
- Our paper, The Mechanical Bard: An Interpretable Machine Learning Approach to Shakespearean Sonnet Generation, was published at the Association for Computational Linguistics (ACL) 2023 and selected for an Outstanding Paper Award.

Outnumbered Online January 2023 - May 2023

Polarization Lab (Duke University) *Durham, NC*

- Used LLM-powered accounts on a lab-developed social media platform to study the effects of interacting in a social media setting with a majority of individuals with politically different opinions, under the supervision of Dr. Christopher Bail, Dr. Sunshine Hillygus, and Dr. Alex Volfovsky.

*denotes equal contribution

Web Scraping for Criminal Activity Detection August 2021 - December 2021
DevLab (Duke University) *Durham, NC*

- Developed various web-scraping algorithms using BeautifulSoup to collect text data from hundreds of news sites to identify markers for criminal activity occurring in Mexico.

Work Experience

Software Engineer Intern May 2023 - August 2023
UiPath, Inc. *Bellevue, WA*

- Developed a chatbot using Retrieval Augmented Generation (RAG) for moving on-premises tools to the cloud.
- Wrote APIs to ingest a variety of documents (primarily product documentation and Slack help threads) into Weaviate vector databases and feed the vectorized data as context for a pretrained large language model.
- Used React and WebView2 to seamlessly integrate the chat application into a core product's frontend.
- Generated and verified a set of questions and answers in order to evaluate chatbot accuracy.

Full Stack Software Developer Intern August 2022 - December 2022
Mash, Inc *Remote*

- Designed a versatile dashboard using SQL querying to analyze user data and optimize existing product features for a burgeoning meetup app.

Awards and Honors

CRA Outstanding Undergraduate Researcher Award - Honorable Mention January 2024
Recognized by the Computing Research Association for showing potential in computing research.

ACL Outstanding Paper Award July 2023
Selected as one of <1.6% of papers at the 61st meeting of the Association for Computational Linguistics.

DTech Scholar July 2023
Selected to receive summer housing funding and networking opportunities for female students in STEM at Duke.

Dean's List May 2023

3rd Place DTCC x HackerRank Competition August 2022

Dean's List with Distinction December 2021

Scholarship Recipient May 2021
Recipient of scholarships from the Scarlett Family Foundation, Mu Alpha Theta, National Honor Society, Cornerstone Financial Credit Union, and the Nashville Athena Program.

Leadership and Community Involvement

Advising Fellow May 2023 - Present
Matriculate *Remote*

- Support high-achieving, low-income high school seniors applying to college by editing their essays, connecting them to relevant scholarships/university programs, and providing general application advice/insight through 1:1 meetings.

Member Advocate January 2022 - Present
Community Empowerment Fund (CEF) *Durham, NC*

- Meet with local Durham community members in weekly 1:1 office hours to provide supportive resources to reach employment, housing, and finance goals.

Workshop Lead November 2022, November 2023
FEMMES+ Hacks (Duke University) *Durham, NC*

- Produce slideshow and Python Jupyter notebook materials on introductory programming and data cleaning skills.
- Co-lead workshops and debug code to encourage female-identifying students' interest in computer science.

Diversity in Tech Fair Vice President January 2023 - January 2024
DTech (Duke University) *Durham, NC*

- Organize the Diversity in Tech Fair to connect students that are traditionally underrepresented in tech with companies focused on diversity/inclusion, culminating in 300+ students and 90 company reps registered, and 780 1:1 sessions.
- Engage in skill development, networking, and mentoring activities designed for women pursuing technical careers.

Technical Skills

Languages: Python, Java, JavaScript, C, TypeScript, SQL, R, HTML/CSS
Software/Frameworks: Git, Numpy, Pandas, PyTorch, GATE, Weaviate, Postman, RStudio, React.js, Cloudflare Workers, Flask