



Curtis Murray (he/him)

- NLP Researcher
- Data Scientist
- Applied Mathematician
- PhD Candidate
- Husband & Father

Languages

R 7 yrs

Python 4 yrs.

Skills

Data science 5 yrs.

Statistics 5 yrs.

Data Visualisation 5 yrs.

Data Engineering 5 yrs.

Machine learning 5 yrs.

Natural Language Processing 4 yrs.

Deep learning 1 yrs.

Biography

As an experienced NLP Healthcare Researcher and Applied Mathematics PhD from the University of Adelaide (pending near submission!), my journey has been driven by a deep fascination with the power of data and algorithms to unravel complex patterns and address critical challenges in healthcare. In my PhD, I harnessed NLP to extract patient reported experiences from social media data, offering a fresh perspective on healthcare experiences. Beyond my PhD, I've applied statistical and machine learning techniques in diverse contexts, including a project at the University of Adelaide where I used NLP to detect signals for recall in adverse event medical report data, and at Swinburne University of Technology where I conduct predictive modeling of falls for elderly care. Further, a short exposure to the corporate world as an energy market analyst has allowed me to hone my communication and team-centred skills, leading to successful clean energy proposals. My academic rigor, combined with practical experience, positions me uniquely for contributing to pioneering NLP research in healthcare.

Education

PhD in Applied Mathematics

2020 - 2023 (Expected)

School of Mathematical Sciences
The University of Adelaide

My PhD lies in a fascinating intersection of Applied Mathematics, Statistics, Computer Science, and Healthcare. Understanding patient experience in healthcare is increasingly important and desired by medical professionals in a patient-centred care approach. Healthcare discourse on social media presents an opportunity to gain a unique perspective on patient-reported experiences, complementing traditional survey data. Harnessing patient reported experiences from this discourse requires modern techniques in Natural Language Processing that can reveal structure from free-text comments. In my PhD I make numerous contributions to this research problem through a series of papers.

First Class Honours in Mathematics (Statistics)

2019

School of Mathematical Sciences
The University of Adelaide

Exploring methodologies for uncertainty quantification and misclassification diagnosis in deep learning through stochastic injection techniques.

- GPA 7.0 of 7.0
- University Medal

Bachelors in Mathematics (Pure Mathematics)

2015-2018

School of Mathematical Sciences
The University of Adelaide

- Executive Dean's Recognition for Academic Excellence

Work experience

Interests

- ▶ Problem Solving
- ▶ Running
- ▶ Photography

References

Prof. Lewis Mitchell

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Prof. Mark Mackay

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Dr. Simon Tuke

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Research Associate

2023 - Present

Swinburne University of Technology

As a Research Associate at Swinburne University, I am working on a research project focused on analyzing HalleyAssist's ambient assisted living system's sensor data to enhance the safety and well-being of seniors. My research seeks to answer the following questions: (1) Can a signal be identified within the sensor data that predicts a fall? and (2) How does understanding the likelihood of falls occurring contribute to a better comprehension of the components that cause falls?

Energy Market Analyst

2022-2023

Energy Exemplar

Utilising my robust background in Applied Mathematics, alongside R and Python, I devised optimised solutions for renewable energy targets that contributed to securing numerous and significant sales, including a project I lead where I created and presented a model that generated a \$600,000 sale. This role involved complex problem-solving across numerous concurrent projects, collaborative efforts with diverse teams, and delivering presentations to high-paying clients.

Research Assistant

2021 - 2022

The University of Adelaide

As a Research Associate at the University of Adelaide, I specialised in applying Natural Language Processing to analyse spontaneous medical report data, focusing on the detection of adverse event signals for medical device recalls. My work involved the use of topic modeling to mine unstructured text from medical reports in retrospective recall analysis. We showed that certain thematic elements of reports, such as discussion around pain, was disproportionately higher in devices that went on to be recalled. This research indicates that adverse event reports can be monitored and mined for signals to recall much earlier than actual recalls occur, and was presented as a research poster at the 44th Annual Conference of the International Society for Clinical Biostatistics in 2023.

Teaching Assistant

2019 - 2022

School of Mathematical Sciences
The University of Adelaide

In my role as a Teaching Assistant, I marked assignments and refined my communication skills by evaluating diverse styles. My responsibilities included providing feedback to students and assisting with the explanation of complex mathematical concepts.

Mathematics Tutor

2019

School of Mathematical Sciences
The University of Adelaide

Developing communication skills to convey complex ideas to match the audience's understanding.

Publications

- Murray, C., Mitchell, L., Tuke, J., & Mackay, M. (2022). Revealing Patient-Reported Experiences in Healthcare from Social Media using the DAPMAV Framework. arXiv preprint arXiv:2210.04232.
- Murray, C., Mitchell, L., Tuke, S., & Mackay, M. (2021). Symptom Extraction from the Narratives of Personal Experiences with COVID-19 on Reddit. ICWSM. <https://doi.org/10.36190/2021.71>

Conferences/Talks

- "Symptom Extraction from the Narratives of Personal Experiences with COVID-19 on Reddit." 7th International Workshop on Mining Actionable Insights from Social Networks. Special Edition on Mental Health and Social Media. 2021
- "Harnessing Patient Experiences from Social Media: A Pilot Study using COVID-19 Data from Reddit". HealthData21. 2021. Talk available at <https://www.youtube.com/watch?v=rBQgyKYSjLA>.
- "Covid symptom extraction". Digital Health Live: Future Digital Health Leaders | Emerging South Australian Talent. 2020.
- School of Mathematical Sciences talks at the University of Adelaide

Awards and Prizes

- Winning team of Hackathon, awarded \$20,000, Queensland AI Hub, 2020
- University Medal, The University of Adelaide, 2019
- First Class Honours with 7.0 GPA (out of 7.0), 2019
- Executive Dean's Recognition for Academic Excellence, 2018

23rd January 2024

Curtis Murray