

Sharon Ferguson

PhD Student
Mechanical & Industrial Engineering
University of Toronto

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EDUCATION

- PhD. **Mechanical and Industrial Engineering**, University of Toronto, Toronto, ON
MAsc. 2020-2021. Fast-Track to PhD. 2021-2025.
Advisor: Dr. Alison Olechowski
Relevant Courses: CSC2515: Introduction to Machine Learning, MIE1517: Deep Learning, ETH1000: Ethics of AI in Context, CSC2552: Topics in Computational Social Science
- BASc. **Industrial Engineering**, Honours, 3.84/4.0, University of Toronto, Toronto, ON, 2020
Minor in Engineering Business
Relevant Courses in Machine Learning and Human Factors
Undergraduate Thesis: *Experiential User-Experience Sessions for Healthy Aging Technology*.
Supervised by Dr. Mark Chignell

PUBLICATIONS

Journal Article Manuscripts Under Review

- Accepted Ferguson, S., Cheng, K., Adolphe, L., Van de Zande, G., Wallace, D., and Olechowski, A.
Communication Patterns in Engineering Enterprise Social Networks: An Exploratory Analysis using Short Text Topic Modelling. *Accepted at Design Science* (2021)
- Submitted Ferguson, S., Lai, K., Chen, J., Faidi, S., Leonardo, K., and Olechowski, A. "Why couldn't we do this more often?": exploring the feasibility of virtual and distributed work in product design engineering. *Under second round of review at Research in Engineering Design* (2021)

Peer-Reviewed Conference Proceedings Under Review

- Accepted Ferguson, S., Mao, K., Magarian, J., Olechowski, A. Advancing a Model of Students' Intentional Persistence in Machine Learning and Artificial Intelligence. *Accepted to the American Society of Engineering Education annual conference*, 2022.

Works in Progress

- Progress Ferguson, S., Hu, Y., Chignell, M. Choosing Effective Videos for Exergaming Applications. *In preparation for International Journal of Human-Computer Studies*, 2022.
- Progress Ferguson, S., Ozecylan, M., Chiu, K., Alexander, R., Kuzminykh, A. Open for interpretation: Comparing Human and AI explanations of sexism assessment. *In preparation for ACM Conference on Human-Agent Interaction*, 2022.

TALKS

Invited Talks

- 2022 University of Toronto Centre For Ethics: Ethics of AI Emerging Scholars Series: “Advancing a Model of Students’ Intentional Persistence in Machine Learning and Artificial Intelligence” presenter, March 2022.

Conference Presentations Without Proceedings

- 2021 S. Ferguson, A. Olechowski, ““Why couldn’t we do this more often?": exploring the feasibility of virtual and distributed work in product design engineering” ASME IDETC Conference, Lightning Talk, 2021.
- 2021 S. Ferguson, A. Olechowski, “ Exploring Short Text Topic Models in the Context of Product Design Enterprise Social Network Messaging” University of Toronto Engineering Research Conference, Oral Presentation, 2021. **Awarded First Place in Data Analytics, AI, and Robotics section**
- 2020 S. Ferguson, A. Olechowski, “Towards the Future of Work from Home via Interviews with Engineering Designers” McMaster Engineering Technology Research and Innovation Conference, 2020.
- 2020 S. Ferguson, S. Dusciuc, M. Vella, Y. Sivaparamanatha, “Jump Detection and Metric Extraction using Machine Learning: A Case Study in Snowboarding” SPort INnovation (SPIN) Summit, 2020.

AFFILIATIONS

- RA **COoKIE Research Group** Led by Anastasia Kuzminykh, Faculty of Information, University of Toronto, 2021-2022
Project: *Examining explanation strategies of humans and AI*
- Fellow **Ethics of AI Graduate Research Fellowship** University of Toronto, 2021-2022
Graduate Research Fellowship at the University of Toronto, Centre for Ethics
Project: *Examining Diversity and Intentional Persistence in Machine Learning and Artificial Intelligence*
Responsibilities: Moderated presentations for the Ethics of AI in Context speaker series
- Fellow **Toronto Human-AI Interaction Research School**, University of Toronto, 2021
Research school held by the University of Toronto Faculty of Information.
Project: *Detecting Sexism in Text: Humans vs. Machines*
Advisors: Dr. Anastasia Kuzminykh and Dr. Rohan Alexander

GRANTS AND AWARDS

Grants and Scholarships

- 2022 NSERC Canada Graduate Scholarship - Doctoral (\$105,000)
- 2021 Queen Elizabeth II Graduate Scholarship in Science and Technology (\$15,000)
- 2021 Ontario Graduate Scholarship (\$15,000) *Declined*
- 2021 Ethics of AI Graduate Research Fellowship (\$2500)
- 2021 Toronto Human-AI Interaction Research School Fellow (\$500)
- 2020 University of Toronto Global COVID-19 Student Engagement Grant (\$3000)

- 2020 NSERC Undergraduate Research Award (\$4800)
- 2015 University of Toronto Admissions Scholarship (\$3000)
- 2015 University of Toronto Scholar (\$6000)

Awards and Honors

- 2021 Selected as University of Toronto nominee for Vanier Scholarship
- 2021 Best Oral Presentation in Data Analytics, AI, and Robotics Stream at the University of Toronto Engineering Research Conference (\$500)
- 2020 2nd Place Capstone Award - Industrial Engineering class of 2020 (\$600)
- 2018 1st Place - Healthy Aging Technology Hackathon

TEACHING EXPERIENCE

University of Toronto

- 2022 **Head Teaching Assistant** MIE459: Organization Design
Designed assignments and rubrics, led tutorials, and assisted in the creation of exam materials.
- 2021 **Guest Lecturer** TEP1502: Leadership in Product Design
- 2021 **Lab Instructor** MIE262: Operations Research 1
Taught synchronous lab sessions using Excel, AMPL, Gurobi and Java to solve linear programs. Advised students throughout the completion of the course project.
Nominated for Teaching Assistant Award.
- 2020/21 **Teaching Assistant** MIE242: Psychology for Engineers
Prepared lectures to transition course to an online format. Created and led a workshop for 130 students about effectively reading academic papers, in collaboration with the Engineering Communication Program.
Nominated for Teaching Assistant Award.

PROFESSIONAL EXPERIENCE

- 2018/19 **Power System Data Analyst** *Independent Electricity System Operator.*
Published the 20-year electricity demand forecast to 50+ stakeholder groups, informing 3000 MW of investments. Implemented an automated pipeline to gather generator data from 10+ sources into a relational database used by 8 teams. Designed data-visualization queries in Tableau to automatically update charts used in quarterly publications.

SERVICE

Outreach Activities

- 2021/22 **Vice President Finance** Graduate Society of Women Engineers, University of Toronto. Responsible for managing and budgeting club funds, applying for external funding opportunities, and organizing events. Tripled club finding from previous year.
- 2021 **Workshop Co-Lead** Camp Ooch Teen Conference Skill Building Workshops. Led a coding workshop to introduce Python to 14-18 year olds.

- 2020 **Panel Moderator** ‘Female Leaders and the Changing Landscape of Engineering’ with the Ontario Society of Professional Engineers
- 2018 **High School Mentor** Women in Science and Engineering

Peer-Reviewing

- 2022 Reviewer for ACM Conference on Computer-Supported Cooperative Work and Social Computing

SKILLS

Computing Languages: Python, R, Java, SQL, MATLAB

Python Packages: scikit-learn, Matplotlib, NumPy, SciPy, NLTK, SpaCy, Gensim, Jupyter

Other Computing: Git, \LaTeX

Academic Professional Development Courses: Becoming a Better Editor of Your Work, Writing NSERC Proposals, University of Toronto Unconscious Bias Education Modules, Canada Research Chair Unconscious Bias Training Module, Department for Women and Gender Equality’s Introduction to Gender-Based Analysis+, Workshop for Qualitative Analysis in Human-Computer Interaction

RESEARCH INTERESTS

Computational Social Science, Human-Computer Interaction, Natural Language Processing, Gender and Diversity, Machine Learning, Explainable Artificial Intelligence, Engineering Design

Updated May 2022