Davide Gentile

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SUMMARY

Research scientist with 8+ years experience leading multidisciplinary projects in human-automation interaction within safety-critical industries, specializing in experimental design, protocol development, data collection and analysis. Skilled in cross-functional collaboration and translating complex insights for diverse stakeholders to inform the design of human-centered technologies.

PROFESSIONAL EXPERIENCE

Team Lead, Analysis & Experimentation | Postdoctoral Researcher
University of Toronto, Cognitive Engineering Laboratory | Toronto, ON | Sep 2024 – Present

Leading five projects on human factors in nuclear control rooms, overseeing recruitment, study execution, and mentoring a team of six researchers. Helping manage a $360K research budget, coordinating academic and industry collaborations across North America and Europe.

Data Science Consultant
Armilla AI | Toronto, ON | Jan 2024 – Jun 2024

Developed risk frameworks and conducted usability testing for large language models, ensuring compliance with global safety standards. Collaborated with cross-functional teams to implement findings into AI product strategies.

Human Factors Researcher
University of Toronto | Toronto, ON | Sep 2019 – Aug 2024

Designed and conducted human-subjects experiments to study human-AI performance in industrial decision-making tasks. Evaluated machine learning models of naturalistic driving data to tailor insurance premiums based on driver risk. Secured $115K in funding, published findings in top journals, and mentored 400+ students in human factors and statistics.

Human Factors Intern
Ericsson | Montreal, QC | Oct 2020 – Sep 2023

Designed user studies to assess machine learning interpretability for data scientists, developing surveys and subjective scales from scratch. Collaborated across teams to integrate human factors insights into AI products.

EDUCATION

PhD, Human Factors Engineering, University of Toronto (2019 – 2024)
MSc, Cognitive Science of Language, McMaster University (2017 – 2019)
BA, Lettere Moderne, University of Bologna (2014 – 2017)

TECHNICAL SKILLS

Human-in-the-loop Simulations, Experimental Design, Usability Testing, Survey Development, Power Analysis, Descriptive & Inferential Statistics, Regression & Factor Analysis, Supervised Machine Learning, AI Usability, Human-AI Interaction, R, Python, GPower, Data Visualization, Qualitative & Quantitative Research

APPENDED ACADEMIC CV

Davide Gentile

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ACADEMIC APPOINTMENTS

Postdoctoral Fellow, Cognitive Engineering Laboratory, Department of Mechanical and Industrial Engineering, University of Toronto, Canada — *2024-Present*

- Leading 5 experimental and analytical research projects on human performance in safety-critical systems; selected and funded by the Natural Science and Engineering Research Council of Canada (NSERC) and the Canadian Nuclear Safety Commission (CNSC); yielding 4 public presentations and 2 conference proceedings in 5 months.
- Supervising a team of 3 junior researchers and 2 industrial engineers, resulting in the development of one MSc thesis and two PhD dissertations using a micro-world research platform for human-subjects experiments to study the human performance impacts of automated features in modern nuclear operations.
- Managing collaboration across national and international partners, including Idaho National Laboratory in the USA, and the Institute for Energy Technology in Norway.

Graduate Affiliate, Schwartz Reisman Institute for Technology and Society, Toronto, Canada — *2021-2024*

- Collaborated with experts and scholars from diverse fields on topics related to the impact of AI and other emerging technologies on human communities, including bias, fairness, accountability and transparency.
- Gained experience with applying both technical and non-technical (policy, ethical, social) approaches to model risk and impact assessments, as well as with the AI policy landscape as broadly defined (EU AI Act, ISO Standards, etc.).
- Published articles on AI transparency, user interaction with large language models, and ethical AI design.

Research Assistant, Department of Mechanical and Industrial Engineering, University of Toronto, Canada — *2019-2024*

- Led and published multi-year projects in human-AI interaction focused on user performance consequences of machine feedback (transparency, explainability) in industrial process control and related safety-critical systems.
- Conducted extensive machine learning analysis of naturalistic driving data to tailor insurance policies based on drivers' risk of collision and near accident events.
- Trained 400+ engineering students in statistics, R programming, and human factors; Advised students on projects in human-centered system design for Toronto-based industry partners (e.g., Metro, Voilà, Kritik) from inception to delivery.
- Disseminated research in peer-reviewed journals and international conferences.

Research Assistant, Department of Linguistics and Languages, McMaster University, Canada — *2017-2019*

- Conducted topic modeling analysis on Facebook textual data to study the relationship between users' language use, personality traits, and migration behavior.
- Completed coursework on contemporary issues in neuroscience of language, eye-tracking research, and computational linguistics.

RESEARCH PROFILE

My research focuses on human-system integration within safety-critical industries, with an emphasis on automated decision support systems, such as machine learning tools for decision assistance, and human factors in modern nuclear systems. I believe that safety-critical industries should lead the way in automation research, leveraging technology to complement human capabilities and limitations in increasingly digital work environments. My methods are inherently interdisciplinary, bridging engineering, cognitive science, and data-driven systems for decision support. I am dedicated to fostering a collaborative research environment where trainees are encouraged to pursue innovative questions. My objective is to develop critical thinkers and skilled researchers equipped to drive progress in academia, industry, and other contexts where science is applied to advance individual and societal well-being.

PUBLICATIONS

1. **Gentile, D.**, Liang, Y., & Jamieson, G. A. (2025, Accepted). Assessing measures of human performance in the nuclear control room. *Proceedings of the 14th Nuclear Plant Instrumentation, Control & Human-Machine Interface Technologies (NPIC&HMIT 2025)*, Chicago, IL.
2. Lawson-Jack, K., Zoutis, S., **Gentile, D.**, & Jamieson, G. A. (2025, Accepted). Towards a taxonomy of heterogeneity in design of small modular reactors and implications on human performance. *Proceedings of the 14th Nuclear Plant Instrumentation, Control & Human-Machine Interface Technologies (NPIC&HMIT 2025)*, Chicago, IL.
3. **Gentile, D.**, Donmez, B., & Jamieson, G. A. (2024). Human performance effects of combining counterfactual explanations with normative and contrastive explanations in supervised machine learning for automated decision assistance. *International Journal of Human-Computer Studies*, 103434.
4. **Gentile, D.**, Donmez, B., & Jamieson, G. A. (2023). Human performance consequences of normative and contrastive explanations: An experiment in machine learning for reliability maintenance. *Artificial Intelligence*, 321, 103945.
5. Nguyen, T., **Gentile D.**, Jamison, G. A., Gosine, R., & Purmehdi, H. (2023). Designing a glyph-based polar chart to interpret the results of machine learning models. In *Ergonomics in Design: The Quarterly of Human Factors Applications*.
6. **Gentile, D.**, Jamieson, G. A., & Donmez, B. (2021). Evaluating human understanding in XAI systems. In *Position Papers of the ACM CHI Workshop on Operationalizing Human-Centered Perspectives in Explainable AI (HCXAI Workshop)*, Online Virtual Conference.
7. **Gentile D.**, Min D., White T., & Donmez B. (2024, In review). Assessing Risk of Collision with Fleet Telematics for Usage-Based Insurance: A Case Study from South Korean Car Rental Operations. Submitted to *Transportation Research Record*.

PRESENTATIONS

1. **Gentile D.**, Jamieson G. A., Donmez B. (2024). Supporting human performance with explanation interfaces in automated decision assistance for process control. Oral presentation at the *2024 Disruptive, Innovative, and Emerging Technologies in Nuclear*, Toronto, Canada.
2. **Gentile D.**, Donmez, B., & Jamieson, G. A. (2024). Enhancing Human Performance with Post-hoc Explanations in Machine Learning-based Decision Support Systems. Oral presentation at the *7th International Conference on Intelligent Human Systems Integration: Integrating People and Intelligent Systems*, Palermo, Italy
3. **Gentile D.**, Jamieson G. A., Donmez B. (2021). Evaluating human understanding in XAI systems. Oral presentation at the *ACM CHI Workshop on Operationalizing Human-Centered Perspectives in Explainable AI*, *CHI Conference on Human Factors in Computing Systems (CHI '21)*, Yokohama, Japan (held virtually).
4. **Gentile D.** (2021). Designing for human-AI interactions in industrial condition monitoring. Oral presentation at *GAIA (Global Artificial Intelligence Accelerator) Research Thursday*, Ericsson Montreal, QC (held virtually).
5. **Gentile D.** (2020). Human Factors in Explainable AI. Invited panelist at the 2021 *Graduate Student Research Showcase.* Faculty of Applied Science and Engineering, University of Toronto (held virtually).

6. **Gentile D.**, Min D., White T., & Donmez B. (2020). Assessing drivers' collision risk with fleet telematics: a case study from car rental operations. Oral presentation at the 2020 *American Statistical Association Joint Statistical Meetings,* Philadelphia, PA (held virtually).
7. **Gentile D.,** Min D., White T., & Donmez B. (2020). Assessing drivers' collision risk with fleet telematics: a case study from car rental operations. Oral presentation at the 2020 *University of Toronto Engineering Research Conference.* Talk cluster: Artificial Intelligence and Data Analytics (held virtually).
8. **Gentile D.**, Min D., White T., & Donmez B. (2019). Assessing collision risk in fleet operations using Internet of Things. Oral presentation at the *20th Annual Human Factors Engineering Inter-University Workshop (IUW),* Waterloo, ON.
9. **Gentile D.**, Imbault C., Gosling S., Rentfrow J., Potter J., & Kuperman V. (2019). The Big Five and immigration patterns within and across countries. Poster presented at the annual meeting of the *Society for Personality and Social Psychology,* Portland, OR.
10. Imbault C., **Gentile D.**, Gosling S., Rentfrow J., Potter J., & Kuperman V. (2019). The chicken or the egg: does being open cause people to migrate, or does migration cause people to be open? Poster presented at the annual meeting of the *Society for Personality and Social Psychology,* Portland, OR.
11. **Gentile D.**, Imbault C., Gosling S., Rentfrow J., Potter J., & Kuperman V. (2018). Personality as cause and effect of migration. Poster presented at the annual meeting of the *Psychonomic Society,* New Orleans, LA.
12. **Gentile D.** (2018). Proximity predicts concreteness in natural language production. Oral presentation, *Student Research Day,* Department of Linguistics and Languages, McMaster University.

AREAS OF TEACHING EXPERTISE

- Human-AI collaboration
- Statistics and design of experiments
- AI explainability and interpretability
- Sociotechnical evaluation of AI systems

TEACHING EXPERIENCE

Teaching Assistant, Department of Mechanical and Industrial Engineering, University of Toronto

- Case Studies in Human Factors and Ergonomics (MIE345), *2023-2024*
  This project-based course applies human factors and ergonomics principles to system design, focusing on human-automation collaboration, safety, and user-centered approaches to ensure fairness and accessibility.
- Human Factors Engineering (MIE240), *2022-2024*
  In this course, students learn to apply human-centered design principles to systems, processes and consumer products to enhance usability, safety, and compliance with legal standards.
- Statistics and Design of Experiments (MIE237), *2020-2022*
  This course covers statistical methods for empirical research.

EDUCATION

Doctor of Philosophy, Industrial Engineering, University of Toronto, Canada *2019-2024*

- Dissertation: "*Supporting Human Performance with Post-hoc Explanations in Automated Decision Assistance*".
- Advisors: Greg A. Jamieson, Birsen Donmez.
- Committee: Christopher Beck, Scott Sanner, Alessandro Bozzon, Oleksandr Voznyy (Chair).

Master of Science, Cognitive Science of Language, McMaster University, Canada *2017-2019*

- Advisor: Victor Kuperman.
- Academic awards: Ontario Graduate Fellowship, Government of Ontario; MacData Institute Graduate Fellowship.

Bachelor of Arts, Lettere Moderne, Alma Mater Studiorum - Università di Bologna, Italy *2014-2017*
- Advisor: Fabio Tamburini.
- Academic honors: Authored the first English-written thesis in Lettere Moderne at the University of Bologna since its founding in the year 1088.

FUND RAISING

I have raised over $110,000 CAD / $77,000 USD in research funding from:

- Schwartz Reisman Institute for Technology and Society.
- Mathematics of Information Technology and Complex Systems (Mitacs).
- Government of Ontario.

Further details are provided below:

- School of Graduate Studies Conference Grant ($220). *2021*
- Schwartz Reisman Institute for Technology and Society Graduate Fellowship ($7,500). *2021*
- Neil Duncan Thompson Memorial Scholarship ($4,000). *2020*
- Mitacs Accelerate Fellowship ($80,000). *2020*
- 1st Place Prize, University of Toronto Engineering Research Conference ($500). *2020*
- Graduate Student Endowment Fund Award ($1,500). *2020*
- Ontario Graduate Fellowship, Government of Ontario ($12,500). *2019*
- MacData Institute Graduate Fellowship ($7,500). *2018*

ADMINISTRATIVE SERVICE

Reviewer, Journal of Cognitive Engineering and Decision-Making, 2025 - Present.
The Journal of Cognitive Engineering and Decision Making (JCEDM) focuses on research that seeks to understand how people engage in cognitive work in real-world settings and the development of systems that support that work.

Chief Presiding Officer, University of Toronto, 2023.
I oversaw the management and administration of exams for the Faculty of Applied Science and Engineering.

PROFESSIONAL MEMBERSHIPS

- Human Factors and Ergonomics Society *2020 - Present*
- American Statistical Association *2020 - Present*
- Canadian Nuclear Society *2024 - Present*
- Schwartz Reisman Institute for Technology and Society *2021 - 2024*

REFERENCES

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