

WORK EXPERIENCE

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• **IBM Research**

Dublin, Ireland

Research Scientist (AI)

Aug 2022 - present

- Developed a benchmark for evaluating the steerability of large language models, leveraging stochastic control theory to determine how prompting, fine-tuning, and decoding strategies shape model behavior
- Created novel black-box explainability methods for large language models by developing intelligent search algorithms to generate contrastive explanations; applied these methods to explainability in open-text generation, automated red-teaming, and conversational AI (under review at EMNLP 2024)
- Designed and implemented a light-weight transformer-based classifier for detecting conversational degradation in human-AI conversations; designed custom algorithms for generating synthetic training data using large language models (under review at EMNLP 2024)
- Developed recommender system simulators to study dynamic fairness in online advertising domains; demonstrated that informational consent decisions have disparate impact on the recommendation accuracy of specific user groups (published at NeurIPS 2023; featured in BBC Science Focus)

• **University of Illinois at Urbana-Champaign**

Urbana, IL

Postdoctoral Research Associate

Feb 2018 - Aug 2022

- Advised 10 Ph.D. students and published 15 peer-reviewed articles in multi-agent reinforcement learning, stochastic control, and machine learning spanning five federally funded projects (total research funding: \$39 500 000 USD)
- Made foundational contributions to multi-agent reinforcement learning in both cooperative domains (RNN-based information embeddings) and adversarial domains (online attacker intent inference for defense)
- Co-wrote a successful NSF grant valued at \$500 000 USD which funded a three year research program on modeling, learning, and control of epidemic processes

EDUCATION

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• **University of Michigan**

Ann Arbor, MI

Ph.D. – Electrical Engineering &amp; Computer Science (advisor: Demos Teneketzis)

Sept 2011 – Dec 2017

• **University of British Columbia**

Vancouver, Canada

M.A.Sc. – Electrical &amp; Computer Engineering

Sept 2009 – Aug 2011

B.A.Sc. – Electrical Engineering

Sept 2006 – May 2009

SELECTED COMMUNITY ENGAGEMENTS

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• **Dublin City University**

Dublin, Ireland

*Instructor:* Hosted a 3-hr coding tutorial/lab on transformer-based models and applications to master's students in the Deep Learning for NLP program at DCU.

Apr 2024

• **Trinity College Dublin**

Dublin, Ireland

*Mentor:* Mentored a team of 11 undergraduate computer science students on building a compliance assistant for the EU AI Act; won the "public choice" award (3rd of 33 teams).

Jan 2024 – Apr 2024

INTERNSHIPS

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• **Oak Ridge National Laboratory**

Oak Ridge, TN

*Intern:* Designed efficient pricing mechanisms for coordinated charging of plug-in electric vehicles

Summer 2013

• **Defense Research & Development Canada**

Ottawa, Canada

*Intern:* Developed GPU parallelized radar resource management algorithms using Monte-Carlo methods

Summer 2010

• **Broadcom Canada**

Richmond, Canada

*Intern:* Designed DSP algorithms for voice recognition and filtering

Summer 2008

SKILLS

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**Programming:** Python (torch, transformers, langchain), GitHub, MLOps**Theory:** probability & statistics, machine learning, RL, optimization & control, game theory**Documentation, presentation, & graphics:** LaTeX, Keynote, Adobe Illustrator