

Gaël Gendron



ggendro.github.io

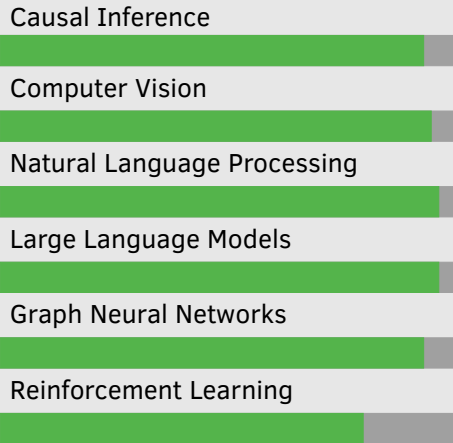


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About me

I am passionate about building robust and trustworthy AI systems that can learn to solve complex problems efficiently. Holding two master's degrees in software engineering and machine learning, I worked as a C++ software engineer in a team at Amadeus IT Group before starting a doctoral program on deep learning for reasoning. I am working on inducing causality theory into large language models to improve their reliability in out-of-distribution and counterfactual scenarios. I have publications in CORE A* Artificial Intelligence conferences (IJCAI, AAMAS, EMNLP, ACL, AAAI) and workshops (CaLM@NeurIPS, CRL@NeurIPS, CV4Animals@CVPR, AGI@ICLR).

Skills



Languages

French	Native speaker
English	Proficient, Fluent (C2)
Spanish	Intermediate (B1)
Chinese	Basic (A2)

Work Experience

since 2024	Research Assistant	University of Auckland, New Zealand
Led the research and development of an open-source project building the first interpretable neural-causal network for behaviour discovery in multi-agent systems with Pytorch, PyG and Tigramite		
2022-2023	Teaching Assistant	University of Auckland, New Zealand
Wrote and taught tutorials in complexity, algorithms, graph theory and advanced machine learning for M.Sc. and B.Sc. levels		
2021-2022	Software Engineer	Alten; Amadeus (contractor), France
Developed C++ software for a key component of Amadeus' Global Distribution System, enhancing scalability of the retrieval pipeline; handled support during code, test and integration phases; management with Scrum; was responsible as a PO (Project Owner)		
Feb - Jul 2020	Research Intern	NAOInstitute, University of Auckland, New Zealand
Designed and implemented an open-source project for knowledge graph reasoning using graph neural networks, with Tensorflow		
May - Aug 2019	Research Intern	Institute of Electronics and Numerical Technologies, France
Developed a resource-efficient embedded serial communication API and reinforcement learning based control module for robotic arms with Keras, Tensorflow, and Dataflow graphs		

Education

2021-2024	Ph.D candidate in Computer Science	University of Auckland, New Zealand
<i>Deep Causal Modelling Approach to Reasoning and Generalisation</i>		
2019-2020	M.Sc. in Computer Science	University of Rennes 1, France
Dual degree while pursuing a <i>Diplôme d'Ingénieur</i>		
2018-2020	Diplôme d'Ingénieur - equivalent M.Sc.	INSA, France
Software engineering		
2015-2018	B.Sc. in Computer Science	INSA, France
Foundations of engineering fields and computer science		
Jan - Apr 2019	International Student Mobility Program	University of Ottawa, Canada
Computer science		
Jun 2018	Chinese General Study	Shandong University, China
Chinese language		

Research Projects

- Counterfactual Inference in Natural Language** Built the first end-to-end framework for causal extraction and inference with large language model agents, using Structural Causal Models and teaching from interventions and counterfactuals
- Abstract Reasoning Evaluation** Conducted the first evaluation of large language models in abstract reasoning and the learning of abstract representations
- Independent Causal Language Models** Built and fine-tuned a novel modular language model architecture based on causal principles for efficient and domain-invariant out-of-distribution reasoning

Latent Space Quantization Created a novel variational auto-encoder based on latent space quantization and causal mechanisms for robust and efficient representation learning

Awards and Fellowships

- Recipient of the 2024 DAAD AInet fellowship - AI for Science
- The University of Auckland Best Student Published Paper in Computer Science for "**Disentanglement of Latent Representations via Causal Interventions**" [Gendron, Witbrock, and Dobbie 2023]

Conference Presentations

- Dec 2024 **Neural Information Processing Systems (NeurIPS)**
Poster presentation at the CaLM@NeurIPS and CRL@NeurIPS workshops [Gendron, Rožanec, et al. 2024] and [Gendron, Witbrock, et al. 2024]
- Nov 2024 **Empirical Methods in Natural Language Processing (EMNLP)**
Oral presentation at the main conference [Gendron, Nguyen, et al. 2024]
- Aug 2024 **NAOI Symposium on exploring creativity and intelligence**
Speaker on the topic of causality and robust reasoning in deep learning
- Aug 2024 **International Joint Conference on Artificial Intelligence (IJCAI)**
Oral and poster presentation at the main conference [Gendron, Bao, et al. 2024]
- Jun 2024 **Global Sustainable Development Congress (GSDC)**
Panelist on the topic of AI, Sustainability and Education with Profs. Siah Hwee Ang (Chair at VUW), Low Teck Seng (Senior Vice President at NUS) and President Banchong Mahaisavariya (Mahidol University)
- May 2024 **International Conference on Learning Representations (ICLR)**
Poster presentation at the AGI@ICLR workshop [Gendron, Bao, et al. 2024]
- May 2024 **International Conference on Autonomous Agents and Multiagent Systems (AAMAS)**
Poster presentation at the main conference [Gendron, Chen, et al. 2023]
- Aug 2023 **International Joint Conference on Artificial Intelligence (IJCAI)**
Oral and poster presentation at the main conference [Gendron, Witbrock, and Dobbie 2023]

Selected Publications

Gendron, Gaël. 2024. "Causal Graph Modeling with Deep Neural Engines for Strong Abstract Reasoning in Language and Vision". *Proceedings of the Thirty-Third International Joint Conference on Artificial Intelligence, IJCAI-24*, ijcai.org. doi: 10.24963/ijcai.2024/960.

2024

Gendron, Gaël, Qiming Bao, Michael Witbrock, et al. 2024a. "Large Language Models Are Not Strong Abstract Reasoners". *Proceedings of the Thirty-Third International Joint Conference on Artificial Intelligence, IJCAI-24*, ijcai.org. doi: 10.24963/ijcai.2024/693.

2024

Gendron, Gaël, Qiming Bao, Michael Witbrock, et al. 2024b. "Large Language Models Are Not Strong Abstract Reasoners Yet". *How Far Are We From AGI @ICLR 2024*.

2024

Gendron, Gaël, Yang Chen, Mitchell Rogers, et al. 2024. "Behaviour Modelling of Social Animals via Causal Structure Discovery and Graph Neural Networks". *Proceedings of the 23rd International Conference on Autonomous Agents and Multiagent Systems, AAMAS-24, IFAAMAS*. doi: 10.5555/3635637.3663132.

2024

Gendron, Gaël, Bao Trung Nguyen, Alex Yuxuan Peng, et al. 2024. "Can Large Language Models Learn Independent Causal Mechanisms?" *Proceedings of the 2024 Conference on Empirical Methods in Natural Language Processing, EMNLP 2024*. doi: 10.18653/v1/2024.emnlp-main.381.

2024

Gendron, Gaël, Joze M. Rozanec, Michael Witbrock, et al. 2024. "Counterfactual Causal Inference in Natural Language with Large Language Models". *Causality and Large Models @NeurIPS 2024*.

2024

Gendron, Gaël, Michael Witbrock, and Gillian Dobbie. 2024. "Robust Domain Generalisation with Causal Invariant Bayesian Neural Networks". *Causal Representation Learning @NeurIPS 2024*.

2024

Gendron, Gaël, Michael Witbrock, and Gillian Dobbie. 2023. "A Survey of Methods, Challenges and Perspectives in Causality". *CoRR*. doi: 10.48550/arXiv.2302.00293.

2023

Gendron, Gaël, Michael Witbrock, and Gillian Dobbie. 2023b. "Disentanglement of Latent Representations via Causal Interventions". *Proceedings of the Thirty-Second International Joint Conference on Artificial Intelligence, IJCAI-23*, ijcai.org. doi: 10.24963/IJCAI.2023/361.

2023