Florence Regol

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McGill Ph.D. candidate - Efficient inference /Uncertainty/Learning on graphs - M.Eng ECSE

I am a 4th-year Ph.D. student with a wide range of research interests, which I have successfully converted into a strong and diverse publication track record. Quickly picking up new fields and approaching new problems with principled methods is my strength. I've efficiently conducted research independently, with peers, and in a supervisory role for students. I have a solid background in probability/statistics and software implementation.

Research Areas

Efficient inference models (early-exit neural networks, dynamic quantization) - Learning uncertainty (generative models for categorical data, evaluating generative models, Bayesian inference) - Machine learning on graphs (node classification/regression, graph sampling, generative graph models, recommender system) - Active learning.

PhD thesis (graduation August 2025): Learning uncertainty for categorical distributions. **Supervisor**: Mark Coates

Master thesis: Active Learning for Attributed Graphs. **Supervisor**: Mark Coates

Selected Publications (google scholar)

References

F. Regol, J. Cotnareanu, T. Glavas, and M. Coates, "Is the acquisition worth the cost? surrogate losses for consistent two-stage classifiers," in *Adv. in Neural Inf. Proces. Syst. (NeurIPS)* ***(Spotlight)***, 2025.

F. Regol, L. Schwinn, K. Sprague, M. Coates, and T. Markovich, "When to retrain a machine learning model," in *Proc. Int. Conf. Machine Learning (ICML)*, 2025.

F. Regol, J. Chataoui, and M. Coates, "Jointly-learned exit and inference for a dynamic neural network: JEI-DNN," in *Proc. Int. Conf. Learning Representation (ICLR)*, 2024.

F. Regol and M. Coates, "Categorical generative model evaluation via synthetic distribution coarsening," in *Proc. Int. Conf. on Artificial Intelligence and Statistics (AISTAT)*, 2024.

T. Galavas, J. Chataoui, **F. Regol**, W. Jabbour, A. Valkanas, B. N. Oreshkin, and M. Coates, "Dynamic layer selection in decoder-only transformers," in *NeurIPS Efficient Natural Language and Speech Processing Workshop (ENLSP)*, 2024.

M. Zeng*, **F. Regol***, and M. Coates, "Interacting diffusion processes for event sequence forecasting," in *Proc. Int. Conf. Machine Learning (ICML)*, 2024.

F. Regol and M. Coates, "Diffusing Gaussian mixtures for generating categorical data," in *Proc. AAAI Conf. on Artificial Intelligence*, 2023.

F. Regol, S. Pal, J. Sun, Y. Zhang, Y. Geng, and M. Coates, "Node copying: A random graph model for effective graph sampling," *Signal Processing*, vol. 192, 2022.

Y. Zhang, **F. Regol**, S. Pal, S. Khan, L. Ma, and M. Coates, "Detection and defense of topological adversarial attacks on graphs," in *Proc. Int. Conf. on Artificial Intelligence and Statistics (AISTAT)*, 2021.

F. Regol, S. Pal, Y. Zhang, and M. Coates, "Active learning on attributed graphs via graph cognizant logistic regression and preemptive query generation," in *Proc. Int. Conf. Machine Learning (ICML)*, 2020.

J. Sun, W. Guo, D. Zhang, Y. Zhang, **F. Regol**, Y. Hu, H. Guo, R. Tang, H. Yuan, X. He, and M. Coates, "A framework for recommending accurate and diverse items using Bayesian graph convolutional neural networks," in *Proc. SIGKDD Conf. Knowledge discovery and data mining (KDD)*, 2020.

Selected Preprints

F. Regol, J. Chataoui, B. Charpentier, M. Coates, P. Piantanida, and S. Günneman, "Predicting Probabilities of Error to Combine Quantization and Early Exiting: QuEE" , submitted to ICML 2025.

Leadership, Organization and Academic contribution

2024 9-10th September — **Co-Organizer, ILLS Workshop**, *École de Technologie Supérieure (ETS)*, Montreal, Canada.

• I scheduled talks, chaired sessions, and coordinated a team responsible for communication and registration.

• I led the creation and execution of a "Brainstorming Problem Session", a novel event format designed to foster closer collaboration and deeper interactions among researchers.

• I invited researchers to submit problems and facilitated small-group discussions around those problems, with the goal of enhancing collaborative problem-solving and idea generation.

2025 — **Area Chair for the BlogPost track of ICLR 2025**.

Reviewer for — • ICLR • AISTAT • ICML

Invited Talks

2024 February — **Invited Seminar**, *Institut de mathématique d'Orsay*, Paris, France.
Learning to Defer with Uncertainty for Efficient Inference:

2023 August — **Invited talk to the 2023 Joint Statistical Meetings (JSM)** , *Session: New frontiers of statistics in trustworthy machine learning*, Toronto, Canada.
Diffusion Models for Categorical Data.

2023 January — **Bellairs Workshop on Machine Learning and Statistical Signal Processing for Data on Graphs**, *Bellairs Research Institute*, Holetown, Barbados.
Evaluating Categorical Generative Models.

Projects

2022-Current — **Active Learning for humans**, *personal project.*

Objective: Evaluate whether active learning algorithms can suggest helpful points for human learners.

Methodology: 1) • Estimate human decision boundaries based on feedback. 2) • Train an active learning algorithm on the estimated function to recommend the next learning point.

Current Status Data collection phase using an online website.

Work Experience

2024-current — **Block (formerly Square)**, *Machine Learning Researcher, Intern*, Remote.

I am working on the problem of determining the optimal time for retraining a machine learning algorithm. My approach includes theoretical methods for obtaining guarantees based on performance shift bounds, as well as empirical analysis. The main outcome of my work is submissions/publications in top-tier machine learning conferences.

2021-2022 — **Sidley Austin LLP**, *Consulting (Machine Learning Expert)*, Remote.

I was contracted by a law firm to provide third-party expertise as part of a patent dispute.

- Analyze source code and algorithms to compare the approaches developed by the parties.
- Summarize my findings and communicate them with the lawyer teams.

2019-2021 **Huawei**, *Associate Researcher, Intern*, Canada, Montreal.

I was part of a group of researchers that focuses on graph related problems. The outcomes of my work at Huawei are research paper publications and patents.

- Fundamental research - Active learning on graphs/Generative models for graphs.
- Product line integration - Integrated a recommender system algorithm.

Summer 2018 **McGill University**, *Undergraduate Research Internship (SURE)*, Canada, Montreal.

May'17 - March'18 **Hydro-Quebec**, *Software Developer Internship*, Montreal, Canada.

2015-2017 **Cysca-Sysacom**, *Software Developer Internship*, Montreal, Canada.

Education

2024 Winter **Visiting Ph.D.**, *Technical University of Munich, Germany*, visiting **Prof. Stephan Günnemann**.

2020-Current **Doctor of Ph.D. Eng.**, *McGill University, Canada*, supervised by **Prof. Mark Coates**.

2018–2020 **Master of Engineering in Electrical and Computer Engineering**, *McGill University, Canada*, supervised by **Prof. Mark Coates**.

2014–2018 **Bachelor of Engineering in Software Engineering - Internship Program**, *McGill University, Canada Graduated with Distinction*.

Scholarships

Jan'24 - May'24 **Canada Graduate Scholarships – Michael Smith Foreign Study Supplements**
(6 000 $) Natural Sciences and Engineering Research Council of Canada

Jan'24 - May'24 **Graduate Mobility Award**
(6 000 $) McGill University

May'21 - May'24 **Alexander Graham Bell Canada Graduate Scholarship-Doctoral (NSERC)**
(105 000 $) Natural Sciences and Engineering Research Council of Canada

Sept'20 - May'24 **McGill Engineering Doctoral Award (MEDA)**
(128 000 $) McGill University

Sept'19 - May'19 **Graduate Excellence Fellowship (GEF)**
(3000 $) McGill University

Sept'18 - May'20 **McGill Engineering Undergraduate Student Masters Award (MEUSMA)**
(35 000 $) McGill University

May'18 - Sept'18 **Undergraduate Research Internship (SURE)**
(5625 $) McGill University