

Florence Regol

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Machine learning on graphs - PhD candidate - B.Eng/ M.Eng ECSE - Montreal

Research Interest

Learning uncertainty (generative models for categorical data, evaluation for distribution learning methods, Bayesian inference) - Machine learning on graphs (node classification/regression, graph sampling, generative graph model, recommender system) - Active learning.

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

Publications

S. Pal, A. Valkanas, **F. Regol**, and M. Coates, “Bag graph: Multiple instance learning using bayesian graph neural networks,” in *Proc. AAAI Conf. on Artificial Intelligence*, 2022.

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 (AISTATS)*, 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.

S. Pal, S. Malekmohammadi, **F. Regol**, Y. Zhang, Y. Xu, and M. Coates, “Non parametric graph learning for bayesian graph neural networks,” in *Proc. Uncertainty in Artificial Intell. (UAI)*, 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 *KDD*, 2020.

F. Regol, S. Pal, and M. Coates, “Node copying for protection against graph neural network topology attacks,” in *Proc. IEEE Computational Advances in Multi-Sensor Adaptive Process. (CAMSAP)*, 2019.

S. Pal, **F. Regol**, and M. Coates, “Bayesian graph convolutional neural networks using node copying,” in *Proc. Learning and Reasoning with Graph-Structured Representations Workshop (ICLR)*, 2019.

——, “Bayesian graph convolutional neural networks using non-parametric graph learning,” in *Proc. Representation Learning on Graphs and Manifolds Workshop (ICML)*, 2019.

Research Experience

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

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

- Fundamental research - Active learning on graphs/ generative models for graphs
- Integrate machine learning algorithms developed by the research team to the product line.
- Python, Tensorflow

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

I worked on a breast cancer detection system that uses radio frequency (RF) as a screening mechanism. My main contribution was to develop neural networks for classifying the scans. I also took part in the preprocessing step by evaluating multiple techniques to extract features from the generated signals.

- Design and develop machine learning classifiers (K-NN and Neural Network).
- Optimize the hyperparameters search with genetic algorithm.
- Process the collected signals from the antennas using time-frequency analysis.
- Python, Tensorflow/Keras, Pytorch

Education

Current	Doctor of Ph.D. Engineering , <i>McGill University, Canada</i> , Supervisor : Prof. Mark Coates .
2018–2020	Master of Engineering in Electrical and Computer Engineering , <i>McGill University, Canada</i> , Supervisor : Prof. Mark Coates . GPA: 3.88/4
2014–2018	Bachelor of Engineering in Software Engineering - Internship Program , <i>McGill University, Canada</i> . GPA: 3.72/4 Graduated with Distinction
Relevant Coursework	Applied Machine Learning, Sampling Theory, Graph Theory, Network Analysis, Generalized Linear Models, Statistic and Probability, Bayesian Inference

Workshop

2021 February	• Bellairs Workshop on Machine Learning and Statistical Signal Processing for Data on Graphs , <i>Bellairs Research Institute</i> , Holetown, Barbados. Diffusion Generative Model for Categorical Data Modeling.
2019 February	• Bellairs Workshop on Machine Learning and Statistical Signal Processing for Data on Graphs , <i>Bellairs Research Institute</i> , Holetown, Barbados. Active Learning on Graphs - Sampling the Initial Set.

Scholarship

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

Working Experience

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

I worked there full-time during the summer and part-time the following school year with a team of 5 developers. My tasks were to develop and maintain tools for a design software.

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

I worked at Cysca-Sysacom as an intern for two summers and continued as a part-time developer during my studies.