Florian Tambon

701-50 Avenue Willowdale, H3T1G1, Montréal, Canada | tambonflorian01@gmail.com | +1 438-346-7594

https://florian-tambon.github.io/ | Languages: French (Mother tongue), English (Fluent)

Education

PhD in Software Engineering, Polytechnique Montréal - Canada Sept 2020 – Sept 2024 (Expected)

Thesis: **Who Tests the Testers? Assessing the Effectiveness and Trustworthiness of Deep Learning Model Testing Techniques**.

Master of Engineering, KyuTech - Japan Sept 2018 – March 2020
Double degree - *Thesis:* Content Style Disentanglement Autoencoder through Optimal Transportation.

Engineering Degree, Écoles des Mines de Saint-Étienne - France Sept 2016 – March 2020
General courses in mathematics, physics, computer science, corporate management and communication tools. Specialization in IT and AI.

Preparatory Classes, Lycée Thiers - France Sept 2014 – March 2016
Preparation for nationwide competitive entrance exams to engineering schools. Fundamental courses in mathematics, physics and engineering.

Technical Skills

Deep Learning Frameworks	PyTorch, Tensorflow/Keras
Scientific Libraries	Numpy, Scipy, Matplotlib, Pandas, Scikit-Learn
Data Processing Libraries	BerTopic, OpenCV, Gensim
Other Deep Learning Tools	HuggingFace, DeepStream
Programming Languages	Python, Shell, C++
Other Tools	Git, Latex, Microsoft Office

Research Projects

Deep Learning Model for Targeting System - Polytechnique Montréal Sept 2021 – May 2024
I contributed to the AI team and developed an automatic targeting system from scratch as part of the student robotics association that took part in the Robomaster competition.

- Preprocessing available data to adapt to the current challenge
- Training an object recognition model (YOLO) using available data from the competition
- Quantizing and deploying the model on robots using a Jetson Xavier embedded module

Predicting Lightning Strike On Airplane Components - DEEL Sept 2022 – Sept 2023
I collaborated with academics and aerospace industrial partners within the DEpendable & Explainable Learning (DEEL - https://deel.quebec/en/) project, which funded part of my PhD.

- Analyzing historical lightning strike data on airplanes to extract and process relevant features
- Formulating the task as a machine-learning one-class anomaly detection problem
- Using a Local Outlier Factor (anomaly detection) model to decide whether new airplane parts are outliers
- Leveraging the SHAP approach to provide explainable model predictions

Teaching Experience

I served as a Teaching Assistant for three sessions at Polytechnique Montréal, where I conceived, taught, and graded practical labs for undergraduate students.

Introduction to Programming - Polytechnique Montréal Autumn 2022, Autumn 2023
Basis of programming using Python: Program structures, Algorithms, Scientific Libraries and Basics of OOP.

Methods for Testing and Validating Software - Polytechnique Montréal Autumn 2021
Coverage Testing, Control Flow Graph, Unit Testing/Mock Testing, Object-oriented Testing, Logic Testing etc.

Selected Publications

As of July 26th, 2024, my publications have **140 citations** (Google Scholar: https://tinyurl.com/flotamgs)

Journal papers

[1] Tambon, F., Nikanjam, A., Khomh, F., & Antoniol, G. (2024). *Assessing Programming Task Difficulty for Efficient Evaluation of Large Language Models*. Preprint: https://arxiv.org/abs/2407.21227

[2] Tambon, F., Dakhel, A. M., Nikanjam, A., Khomh, F., Desmarais, M. C., & Antoniol, G. (2024). *Bugs in Large Language Models generated code.* [Submitted for review, Empirical Software Engineering journal], Preprint: https://arxiv.org/abs/2403.08937

[3] Morovati, M.M., Nikanjam, A., Tambon, F. et al. *Bug characterization in machine learning-based systems*. Empirical Software Engineering 29, 14 (2024). https://doi.org/10.1007/s10664-023-10400-0

[4] Tambon, F., Nikanjam, A., An, L., Khomh, F., & Antoniol, G. (2024). *Silent bugs in deep learning frameworks: an empirical study of keras and tensorflow*. Empirical Software Engineering, 29(1) https://doi.org/10.1007/s10664-023-10389-6 [Presented at Journal-First track at the ACM International Conference on the Foundations of Software Engineering (FSE) 2024.]

[5] Tambon, F., Khomh, F., & Antoniol, G. (2023). *GIST: Generated Inputs Sets Transferability in Deep Learning*. ACM Transactions on Software Engineering and Methodology (TOSEM). https://doi.org/10.1145/3672457

[6] Tambon, F., Khomh, F., & Antoniol, G. (2023). *A probabilistic framework for mutation testing in deep neural networks*. Information and Software Technology (IST), 155, 107129. https://doi.org/10.1016/j.infsof.2022.107129

[7] Tambon, F., Laberge, G., An, L., Nikanjam, A., Mindom, P. S. N., Pequignot, Y., ... & Laviolette, F. (2022). *How to certify machine learning based safety-critical systems? A systematic literature review*. Automated Software Engineering, 29(2), 38. https://doi.org/10.1007/s10515-022-00337-x

Conference Proceedings / Talks

[8] Mahu, A., Singh, A., Tambon, F., Ouellette, B., Delisle, J. F., Paul, T. S., ... & Doyon-Poulin, P. (2024). *Validation of Vigilance Decline Capability in a Simulated Test Environment: A Preliminary Step Towards Neuroadaptive Control*. Neuroergonomics and Cognitive Engineering, 45. https://doi.org/10.54941/ahfe1004737 [Best Paper Award, Part of the DEEL Project]

[9] Kouemo Ngassom, S., Moradi Dakhel, A., Tambon, F., and Khomh, F. 2024. *Chain of Targeted Verification Questions to Improve the Reliability of Code Generated by LLMs*. In Proceedings of the 1st ACM International Conference on AI-Powered Software (AIware 2024). Association for Computing Machinery, New York, NY, USA, 122–130. https://doi.org/10.1145/3664646.3664772

[10] Taraghi, M., Dorcelus, G., Foundjem, A., Tambon, F., Khomh, F. (March, 2024). *Deep learning model reuse in the huggingface community: Challenges, benefits and trends*. In 2024 IEEE Conference on Software Analysis, Evolution and Reengineering (SANER) (pp. 512-523). IEEE. https://doi.org/10.1109/SANER60148.2024.00059

[11] Tambon, F., Majdinasab, V., Nikanjam, A., Khomh, F., & Antoniol, G. (2023, April). *Mutation testing of deep reinforcement learning based on real faults*. In 2023 IEEE Conference on Software Testing, Verification and Validation (ICST) (pp. 188-198). IEEE. https://doi.org/10.1109/ICST57152.2023.00026

Multiple talks about my research at "DEEL Carrefour"; a monthly internal presentation of current research within the DEEL project with an international audience.

Professional Service

Reviewer	Transactions on Software Engineering and Methodology (TOSEM): 2024
	Transactions on Software Engineering (TSE): 2024
	Software Quality Journal (SQJO): 2022
Co-Reviewer	Automated Software Engineering (ASE): 2024
	Foundations of Software Engineering (FSE): 2024
	International Conference on Software Engineering (ICSE): 2024