ARMSTRONG FOUNDJEM

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A Mixed-method researcher in the intersection of software ecosystems sustainability, release engineering — AI/ML/Dev-Ops, Certifiability of deep learning models, software engineering for machine learning Applications, natural language processing — Large language models (LLM), representation and lifelong learning, human-centered design, human-computer interaction, mining massive software repositories and datasets — data science, empirical software engineering, edge/cloud computing. Skills in robotics and automation.

CURRENT POSITION

Postdoctoral researcher: "Towards certifiable safety-critical AI systems using learning algorithms"

DEEL Project — Polytechnique Montreal

Under the supervision of Professors: Giulio Antoniol, Ettore Merlo and Foutse Khomh.

I supervise Ph.D and MSc. students on related topics, such as LLM for automatic generating software test cases, counterfactual analysis in deep learning models, Rule-based Repair for Machine Learning systems, etc., I also organize lab meetings, workshops, conferences, etc.

August 2022 – July 2023 Montreal, CA

EDUCATION

Ph.D SW Engineering: "Software Ecosystem Sustainability, a Socio-Technical Perspective"

MCIS Lab — Queen's University (Q) and Polytechnique Montreal (P) (Scholarships: $21.5K ↦ Graduate Fellowship (Q), $32K ↦ Pierre Arbour Foundation (P), $57K ↦ Fondation Universitaire (P))

Affiliated to MCIS laboratory at Queen's University and advised by Prof. Bram Adams

Winter Winter 2018 – Spring 2022 Kingston, CA

- GPA: 4.3/4.3

M.A.Sc., SW Engineering: "Towards Improving the Reliability of Live Migration Operations in Clouds"

SWAT Lab — Polytechnique Montreal (Scholarships: $18K ↦ Pierre Arbour Foundation $34K ↦ Fondation Universitaire)

Affiliated to SWAT laboratory at Polytechnique Montreal and advised by Prof. Foutse Khomh

Winter 2015 – Spring 2017 Montréal CA)

B.Sc. Computer Science Major with co-op

Bishop's University (Scholarship: 3K ↦ Entrance and City of Sherbrooke Scholarships)

Fall 2012 – Summer 2015 Sherbrooke, CA)

Advanced Diploma Micro-Electronics

City & Guilds of London Institute

Fall 2004 – Summer 2006 London, UK)

Licentiate Electrical/Electronics Engineering

City & Guilds of London Institute

Fall 2002 – Summer 2003 London, UK)

CERTIFICATIONS

Machine Learning Black and Indigenous Program

Vector Institute – University of Toronto

Fall 2022 Toronto, CA

- GPA: 100/100 – Excellent
- Selected best Capstone project – Fall 2022
  Project addresses the need of multi-class and multi-label classification problem using fine-tune BERT, LSTM, RNN, etc., on unstructured data.

Deep Learning Workshop – Applied Computer Vision

IVADO-Mila – University of Montreal

Fall 2022 | Montreal, CA

- Workshop

PUBLICATIONS

2022 — Under review

✍ "A grounded Theory Approach on Cross-community Feedback Mechanisms in Open Source Software Ecosystems"
Armstrong Foundjem, Ellis E. Eghan, Bram Adams
TSE 2022 (Journal article, pages: 1-13). Impact factor: 9.9, 1st ranked journal. Online: Coming soon

✍ "A mixed-methods analysis of micro-collaborative coding practices in OpenStack"
Armstrong Foundjem, Eleni Constantinou, Tom Mens, Bram Adams
Empirical Software Engineering: 2022 (Journal article, pages: 1-57). Impact factor: 8.41, 2nd ranked[1] journal. Online: link.springer.com

2021

✍ "Release synchronization in software ecosystems"
Armstrong Foundjem, Bram Adams
Empirical Software Engineering: 2021 (Journal article, pages: 1-50). Online: link.springer.com

✍ "Onboarding vs. Diversity, Productivity, and Quality: Empirical Study of the OpenStack Ecosystem"
Armstrong Foundjem, Ellis E. Eghan, Bram Adams
ICSE 2021 research track (Conference paper, pages: 1033-1045). Rank: A* ranked[2], Online: www.computer.org

✍ "An Open Dataset for Onboarding new Contributors: Empirical Study of OpenStack Ecosystem"
Armstrong Foundjem, Ellis Eghan, and Bram Adams
ICSE-Companion 2021 (Replication package, pages: 240-241). Online: www.computer.org

2019

✍ "Release synchronization in software ecosystems"
Armstrong Foundjem
ICSE-Companion 2019, (Companion Proceedings, Pages:135-137) (Student competition). Online: ieeexplore.ieee.org

2017

✍ **"Broadcast vs. Unicast Review Technology: Does It Matter?"**
Armstrong Foundjem, Foutse Khomh and Bram Adams
ICST 2017, research track (Conference paper, pages: 219-229). Rank A, Online:ieeexplore.ieee.org

✍ **"Towards Improving the Reliability of Live Migration Operations in Openstack Clouds"**
Armstrong Foundjem
(Thesis). Online: publications.polymtl.ca

ACADEMIC EXPERIENCE

During my M.A.Sc. and Ph.D. studies and currently postdoc at Polytechnique Montreal, I have been involve in teaching assistantship (TA) both at (under)graduate ($U_{1...4}/G$)-levels. Taxed to prepare Labs and hands-on tutorials.

[1] https://research.com/journals-rankings/computer-science/software-programming
[2] http://portal.core.edu.au/conf-ranks/

Teaching Assistant (U1)— Introduction to Software Engineering,Log1000
Polytechnique Montreal

Fall 2015 — Fall 2016 | Montréal, CA

Selected topics: Characteristics of a Software artifact; Configuration management and build systems; Software development life-cycle Models; Phases of the Life cycle: analyses, specification, conception, realization, tests, and maintenance; Definition of requirements: explicitness, user constraints, system boundaries, consistency, completeness, verifiability, durability, and maintenance.

Extra Office hours | Effective communication | Tolerance and patience | Inclusiveness | Active learning activities

Teaching Assistant (U3) — Software Engineering Processes, Log3000
Polytechnique Montreal

Fall/Winter ↔ 2016/2017/2018/2019 | Montréal, CA

Topics include: Software engineering process. Phases of the software life cycle. Tools and methods of support to the process. Overview of different software development process philosophies. Technical disciplines of the software engineering process.

Process evaluation/improvement | Representation of the processes | Meta model | Empirical analysis of processes

Teaching Assistant (U4) — Conception of dynamic website, Log4420
Polytechnique Montreal

Fall 2015 – Fall 2016 | Montreal, CA

Design of complex and dynamic websites, which generates contents and management of interactions with users. Overview of web architecture and HyperText Transfer Protocol (HTTP), Understanding Markup/style sheet languages such as HTML5, Pug, CSS; back-end servers-side such as Node.js, express; client sides such as Angular2, and database such as MongoDB.

Weekly deliverables | Assignments | Final Project | Online evaluation

Teaching Assistant (G) — Ingénierie de la qualité en Logiciel, Log8371
Polytechnique Montreal

Winter 2020/2023 | Montreal, CA

Topics include: Software Quality Assurance, Components of the SQA system, Testing, CI/CD pipeline, Quality of Code - Maintainability, Software Performance, Auto scaling, Risk management, etc.

Industrial scale testing | State of the arts frameworks | Final Project | Final presentation

PROFESSIONAL EXPERIENCE

Towards improving DevVel across Microsoft — Productivity and Intelligence Lab. (Research Intern)
Microsoft Research

June 2021 — Oct. 2021 | Redmond, US

- I investigated ways to improve onboarding time to make new hires more productive within the first three months of joining Microsoft.
- Using a mixed-method analysis, I interviewed 20 managers globally across Microsoft, sent out a survey to 3K engineers, then analyzed code base activities of 20 top ecosystems within Microsoft.
- Initial findings suggest three critical roadblocks on reducing developer velocity-time (DevVel: time require to make first-acceptable pull request).

Ecosystem onboarding | Developer velocity | Productivity | Mioxed-method research

Mentoring intent for Google Summer of Code (GSoC), core/maintainer in the evolution working group, CHAOSS Project
Linux Foundation

May 2018 — Ongoing | US

- I serve the community as a Board Member and actively participated in defining and releasing metrics for open source projects, which has enabled the growth of CHAOSS community within the industry and academia.
- I was the ethic commissioner for two years making sure our open source community remains inclusive and diverse.

Board member | mentor GSoC | Open source community | Defining metrics | Promotes Diversity & Inclusion

Onboarding new contributors/software developers
Open-Infrastructure Foundation

2018 — Ongoing | Berlin, Germany

- I am a mentor at the Open-Infrastructure foundation. Facilitating new contributors to get started as software developers into the OpenStack codebase.

mentor | OpenStack Upstream Institute | Open source community | Software ecosystem

Facilitated the release synchronization process of ecosystem releases
OpenStack Ecosystem

May 2015 - Ongoing | Texas, US

- I actively participate in the release team that facilitate the coordination of cross-projects teams to a well-polished product throughout a release cycle.
- As a foundation member and core in the release team, I actively participate in weekly review, voluntary, and housekeeping activities within the ecosystem that have improve its overall quality and impacts to end-users.

Release Synchronization | Core Reviewer | Quality control

Building black boxes for vehicles that reconstruct accident scenario and drivers' behaviors
LASSENA Research Laboratory (Undergrad Intern)

May 2014 — Dec. 2014 | Montreal, CA

- Improved simulator performance and generate reports in near release time.
- Team lead, software engineering. I used agile methodology to speed up development for constantly changing requirements.

'Black-box' | Agile development | System Analyst | Vehicle Tracking | Accident Diagnostic

Analyzing use-cases and building a web portal for an online stock market
Idema Placement (College Intern)

May 2012 - August 2012 | Montreal, CA

- I optimized a stock market platform `iShares` that improved investment in the stock market.

Stock market | Web portal | College intern | System Analyst

Applying my analytical and programming skills to developer geographic data processing engine
Facebook Head Office (Intern)

Jan. 2013 - June 2013 | California, US

- I learn Scala and Python on the go to develop solutions for high performance applications.

System Analyst | Developer | Geographic Information System | Intern

Analyzing results from site survey to propose technical/technological requirements
Pastel Telecoms S.A (Electrical Engineer)

June 2005 - Dec. 2009 | Douala, CMR

- I adapted a local solution to build transmission units for clients with changing need yield an annual saving of US $28K.
- Built a smart power monitoring device to ensuring our based stations stays connected in an environment suffering from constant power failure.
- Implementing security over our networking infrastructure and providing high bandwidth connections.

System Analyst | Vehicle Tracking | Accident Diagnostic | Reconstruction System

Providing consultation services to governmental, non-governmental organizations on standards.
Society of Engineers (incorporated) UK

Apr. 2001 - May 2005

Consultant | Management | Engineering | Critical planning

VOLUNTEERING

Evaluating junior researchers' projects across Canada (National/International Judge)
Youth Science Canada/Canada Wide Science Fair

May 2016 - Ongoing — Canada

- Applying critical/analytical skills to evaluate selected best scientific projects across diverse scholarship in Canada.
- Read a high volume of scientific reports within a limited time frame to make informed decision on the quality and originality of the projects.
- Served as chair in different teams, coordinating and collaborating with top Canadian scientist and professional.
- Face challenges with diverse and state-of-the-art topics ranging from Machine learning, A.I, Physics, Mathematics, Bioinformatics, and Robotics.

Communication | Interpersonal Skills | Critical thinking | Science Judge

Student Volunteer: Ensuring a smooth conference run by allocating resources to participants, 42nd International Conference on Software Engineering ICSE 2020, July 2020

Virtual conference

- I contributed to the success of the conference by being pro-active and reporting timely coordinators.
- Synchronize with teams to manage different time zones and to facilitate authors throughout their presentations.
- Facilitates audiences/participants through a Q/A session for ensuring a maximum response rate.

Student Volunteer | Planning | Managing resources | Communication | Active listening

Final projects evaluation (U4) Engineering
McGill University Montreal

Winter 2016 - 2018 — Montreal, CA

- Evaluating final year multi-disciplinary projects for undergraduate Engineering students, spanning all the engineering fields taught at McGill.

Decision making | Science Judge | Time Management

Student volunteer: Providing wide variety of assistance to participants of the URSI conference
General Assembly and Scientific Symposium of the International Union of Radio Science (URSI) - GASS

August 2017 — Montreal, CA

- I provided a wide variety of help to the URSI conference. I served at the front desk registration and help reduced the wait time for attendees to get themselves register.
- Also, I collaborated with the coordinators and other students to assist participants' (speakers/attendees) needs.

Student volunteer | Conference | Team spirit | Time Management

Green Code Challenge France

Winter 2015 — Paris, Fr.

- Successfully mobilizing a team of talented research scientists/engineering students to an international competition on green software: `www.youtube.com`, and we won the 5th place out of 82 teams.

Green Code Challenge | International competition | Team lead | Extreme programming

WORKSHOP

Student Volunteer: Coordinate a workshop on software engineering for ML professionals
Software Engineering for Machine Learning Applications (SEMLA)

June. 2018 – March 2020 Montreal, CA

- I guided participants to successfully deploy their applications using blue-green and Canary deployment.
- Also, I gave a second hands-on tutorial on versioning machine-learning applications during training and validations for reproducibility.

Workshop | Teamwork | Tutorial | Time Management

Mentor: Training new contributors to start contributing to the OpenStack code base
Open Infrastructure upstream Institute

11-2017/05-2018/11-2018/11-2019 — Sydney/Vancouver/Berlin/Shanghai

- Mentoring new contributors to successfully submit their first change request; quickly guiding them through the documentations and contribution process

Onboarding | Teamwork | Mentoring | Hands-on | Collaborating

PROGRAM COMMITTEES

Junior PC member — Mining Software Repositories (MSR) 2021/2022/2023
Reviewing research papers

May-2021/2022 Virtual-in-person

- Provide constructive feedback to authors on their manuscripts. I was able to improve my skills from the feedback I got from the PC chair.

PC Chair AI/HPC and Machine Learning, Open Infrastructure Summit
Reviewing technical presentation in the AI/HPC/ML track.

11-2019, 10-2020, 06-2022 Denver, US, Virtual, virtual

- As the chair, I suggested the teams to divide submission into the different specialization i.e., AI, HPC, etc. Reviewers were able to focus more on the deliberation process, and we were able to speed up the review process faster.

SKILLS

Machine learning ⇒ NumPy | SciPy | Matplotlib | Pandas | TensorFlow | PyTorch | Scikit-learn | NLTK | Keras

DevOps ⇒ K8S | OpenShift | Docker | Spark | Zuul | AWS | GCloud | Azure

Research ⇒ R | Python | Shell | C/C++ | Java | LaTeX | Emacs/Org-mode

Code review ⇒ Gerrit | Git | GitLab | GitHub

Harware Stuffs ⇒ Micro-controller | Raspberry Pi | Robots

REFERENCES

Available upon request