Thomas Schweizer

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Work Experience

Applied Scientist Intern. Amazon AWS 2022

- Improved the performance of bug fixing machine learning models by building a pipeline to clean bug-fix datasets. Compared to the state-of-the art, the datasets created by my contribution are of higher quality, which trains models with better performance.

Applied Scientist Intern. Amazon AWS 2021

- Improved security coverage for all internal Java Web Applications at Amazon by detecting web vulnerabilities using taint analysis on extracted front-end code.

Research Software Developer. Mila - Quebec Artificial Intelligence Institute 2020

- Developed a machine learning hyper-parameter optimizer used by top ML researchers and students.
- Researched, designed, and developed hyper-parameter visualization features in collaboration with IBM research.
- Improved productivity and coordination for our team of 10 developers by establishing formal management and tracking tools for software projects.

Software Engineer. Digger Foundation 2014 - 2019

- Developed the back-end software and the Android app of the SMART system deployed in Asia, Europe, and Africa to remove landmines safely using remote-controlled machines and dogs.
- Researched and prototyped virtual reality systems to remotely pilot excavators in hazardous environments. The systems are deployed in France and Switzerland.
- Enforced systematic testing for critical software components by introducing an integrated workflow platform and establishing practical software development guidelines for the company.

Education

M.S. in Computer Science (PhD Candidate). University of Washington, United States 2023
Research in improving developer tools using machine learning and program analysis.

M.S. in Computer Science. Université de Montréal, Canada 2020
Research in design decisions in software projects using artificial intelligence and software metrics.

B.S. in Computer Science. HEIG-VD, Switzerland 2014
Major in Software Engineering

Relevant Skills

Topics: Software Engineering, Data Science, Machine Learning, Natural Language Processing, Databases
Languages: Java, Python, HTML/CSS/JavaScript, R, Bash, SQL

Publications and Presentations

T.Schweizer. "An Empirical Evaluation of Commit Untangling Tools." **First place**. *ACM Student Research Competition, 2023 International Symposium on Software Analysis and Testing (ISSTA)*. Seattle, USA, 2023.

T.Schweizer, V. Zafeiris, M. Fokaefs and M. Famelis. "Can Refactorings Indicate Design Tradeoffs?." *2020 IEEE 20th International Working Conference on Source Code Analysis and Manipulation (SCAM)*. Adelaide, Australia, 2020.

T. Schweizer, advised by M. Famelis. "Towards Using Fluctuations in Internal Quality Metrics to Find Design Intents." *Master Thesis - Université de Montréal*. Montréal, Canada, 2020.

T. Schweizer. "Applying Software Engineering Principles to a Machine Learning Algorithm: Lessons Learned." *Poster session at Software Engineering for Machine Learning Applications (SEMLA)*. Montréal, Canada, 2018.

Selected Projects

Email Assistant, Hackathon: Won the 2023 Fixie.ai Hackathon by building a web app that drafts email replies automatically using a Large Language Model (LLM) and a Gmail integration.

Pause, Personal project: Designed, developed, and deployed a health productivity app built on the Electron framework (HTML/CSS/Javascript/NodeJS).

Stargazers, Université de Montréal: Led a team of 4 to train and test machine learning models to detect new exoplanets from NASA's Kepler dataset with an average accuracy of 97%.

Detecting Design Principles, Université de Montréal: Trained a machine learning model that detects the application of SOLID design principles from metric changes in source code with an F1 of 66.4%.

Metric History, Université de Montréal: Created a dataset of 5 software metric changes in source code from 13 projects over 107449 commits by building a static-analyzer agnostic tool that mine source code in version control systems.

Evolution et vie artificielles, HEIG-VD: Conducted controlled experiments to understand the genetic evolution of populations of digital organisms and their behaviors by developing a genetic library in C# and a 3D physic-bound simulation environment in Unity.

Awards and Achievements

University of Washington (GPA 3.9)

First place: ACM Student Research Competition at the 32nd ACM SIGSOFT International Symposium of Software Testing and Analysis — 2023

Research Fellowship: Allen School Computer Science & Engineering — 2020 - 2023

Université de Montréal (GPA 4.0)

Bourse de rédaction DIRO: Departmental scholarship for thesis redaction — 2019

Bourse d'excellence DIRO: Departmental scholarship for academic excellence — 2018 - 2019

Bourse d'excellence FESP: Graduate and post-doctoral studies faculty scholarship for academic excellence — 2018 - 2019

Bourse C: Scholarship of excellence for international students — 2018 - 2020

Haute Ecole d'Ingénierie et de Gestion du Canton de Vaud (Grade A, Class rank 1)

Prix HEIG-VD : Best overall results during all semesters and final project — 2014

Prix GiTi : Excellent bachelor project "*Evolution et vie artificielles*" — 2014

San Jose State University (Summer University Program) — 2013

Best overall grades among 40 international students in the program