Thomas Schweizer

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Experience

Phd Candidate. University of Washington 2020 - 2023

- Ranked and compared commit-untangling tools by conducting quantitative and qualitative research experiments on 836 bug-fixing commits, and built an extendable framework to evaluate these tools.
- Found that intelligence artificial tools with low performance can be useful for users by designing and conducting a user study of 40 participants in controlled experiments.

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 and designed 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

- Designed and built 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. University of Washington, United States 2020 - 2023
Research in improving developer tools using machine learning and program analysis.

M.S. in Computer Science. Université de Montréal, Canada 2018 - 2020
Research in design decisions in software projects using artificial intelligence and software metrics.

B.S. in Computer Science. HEIG-VD, Switzerland 2011 - 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 (ISTA)*. 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: Built a web app that drafts email replies automatically using a Large Language Model (LLMs) and a Gmail integration.

Pause, Personal project: Healthy productivity companion built on Electron (HTML/CSS/Javascript/NodeJS).

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

Detecting Design Principles, Université de Montréal: Built 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 107,449 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.

Academic Experience

Teaching Assistant. University of Washington 2020 - 2023

- Software Engineering for undergraduate students (class of 100)
- Software Engineering for graduate students (class of 6)

Teaching Assistant. Université de Montréal 2018 - 2019

- Advanced Java for undergraduates (class of 60)
- Software Engineering for undergraduates (class of 40)

Awards and Achievements

University of Washington (GPA 3.87)

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 FESP: Graduate and post-doctoral studies faculty scholarship for academic excellence 2019

Bourse de fin de maîtrise: Graduate and post-doctoral studies faculty scholarship for thesis redaction 2019

Bourse d'excellence DIRO: Departmental scholarship for academic excellence 2019

Bourse d'excellence DIRO: Departmental scholarship for academic excellence 2018

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

Bourse C: Scholarship of excellence for international students 2018

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

Swiss Summer University Program at San Jose State University 2013
Best overall grades among 40 international students in the program

GPA (out of 4.0) is calculated from `https://applications.wes.org/igpa-calculator/`.