Bechir Braham

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Location: Munich, Germany

SUMMARY

Software Engineer specializing in scalable DevOps pipelines, distributed systems, and machine learning infrastructure.

TECHNICAL SKILLS

Programming languages	Python, C++, JavaScript, Go, Java
DevOps	CI/CD, Bazel, GitHub Actions, Docker, Kubernetes, Ansible, Terraform, Git, Linux
Cloud Computing	AWS, Azure, GCP
Machine learning/AI	PyTorch, TensorFlow, Ray

EXPERIENCE

Software Engineer **November 2024 - Present**
Build Automation and Tooling Team, Fernride *Munich, Germany*

- Managed and maintained a **Bazel**-based build system for autonomous and teleoperated terminal trucks, supporting a multi-language monorepo.
- Operated and contributed to CI (Continuous Integration) infrastructure across on-premises, AWS and Azure cloud environments; Utilized **Terraform** for infrastructure as code, integrated microservices with **Kubernetes**, and implemented robust monitoring, alerting, and SLOs (Service Level Objectives).
- **Designed and led the implementation** of a static analysis gating solution to enforce safety certification requirements (TÜV), reducing static analysis violations from ~10,000 to ~200 in six months.
- Designed a hibernation based solution for CI cloud machines to preserve the Bazel server cache, potentially resulting in over **90% performance improvement** for cold job runs and approximately **60% reduction in compute costs.**
- Integrated recorded real-world vehicle-simulation tests into CI as a safety-quality gate, sped up runtime using multi-level caching (shared Lustre Filesystem + Bazel remote cache), and added the checks to PR and merge pipelines to speed impact analysis for certified releases.

Software Engineering Intern **February - July 2024**
Detectors Group, Paul Scherrer Institut *Switzerland*

- Architected and implemented a data analysis library for hybrid pixel X-ray detectors using **C++**. The library is able to read and write data from different file formats, send and receive data from multiple servers, synchronize between data-streams and analyze data using different optimized algorithms.
- Developed **Python** bindings with **pybind11** to expose **C++** internals, enabling users to write readable and easy to use Python code while benefiting from C++ performance.
- Provided an easy to use parallelization framework for scientists to run their algorithms. Users are able to run algorithms on: multiple threads, multiple processes and multiple distributed nodes communicating via **ZeroMQ**.
- Improved the parallelization of Python threads (4x improvement) by releasing and acquiring the Global Interpreter Lock (GIL) carefully in the Python bindings.

Software Engineering Intern **August - October 2023**
Detectors Group, Paul Scherrer Institut *Switzerland*

- Contributed to the development of an open-source GUI application for testing and configuring hybrid X-ray detectors. The interface was developed using **Python** and **PyQt** and it binds to **C++** code for faster backend communication with the detector server.
- Implemented unit, integration, and end-to-end testing, reaching test coverage of over 80% for the GUI application.
- Automated C++ code generation for the SLS detector package's command-line interface using Python, reducing code complexity and significantly improving maintainability and flexibility.

DevOps & Backend Engineer (Working Student) **September 2022 - January 2023**
Upkurs *Tunisia*

- Established CI/CD (Continuous Integration and Deployment) pipelines for both development and production environments on **Google Cloud** (GCP); managed deployments for Cloud Storage, **MongoDB** databases, and mail services.
- Implemented a **NestJS** service that communicates with Google Calendar API using **OAuth 2.0** to generate Google Meet links and return them to clients over **WebSockets**.
- Improved backend servers' response times for Authentication and User services by up to 70% through asynchronous programming and algorithmic optimizations.

Machine Learning R&D Intern **June - September 2022**
Laboratory of Images, Signals and Intelligent Systems, University Paris-Est Créteil *France (Remote)*

- Performed comprehensive literature reviews and critically evaluated machine learning methodologies for PTSD recognition using EEG (electroencephalogram) data.
- Co-authored review paper [1], contributing analytical insights and actionable recommendations for advancing EEG-based PTSD detection approaches.

Deep Learning & Computer Vision Engineer Intern **April - May 2022**
EZZAYRA *Tunisia*

- Managed a team of 4 interns to design, test and deploy a deep learning model on an agricultural autonomous robot to locate and classify ripe and unripe strawberries.
- Achieved an mAP (mean average precision) of 0.82 using a YOLO based model and deployed the model with web interface as a prototype.

PUBLICATIONS

[1] Alice Othmani, Bechir Brahem, Younes Haddou and Mustaqueem Khan. "Machine Learning-based Approaches for Post-Traumatic Stress Disorder Diagnosis using Video and EEG Sensors: A Review." IEEE Sensors Journal, 2023 (Q1, Impact factor: 4.3).
[2] Taboubi Bilel, Bechir Brahem, and Hatem Haddad. "iCompass at WANLP 2022 Shared Task: ARBERT and MARBERT for Multilabel Propaganda Classification of Arabic Tweets." Empirical Methods in Natural Language Processing (EMNLP) Workshops 2022 (Class A*).

EDUCATION

Software Engineering Diploma **September 2019 – October 2024**
National Institute of Applied Science and Technology (INSAT), University of Carthage *Tunisia*
Equivalent to Master of Science.

LANGUAGE SKILLS

Arabic: Native, English: Proficient (C1), French: Good (B2), German: Basic (B1) and enrolled in a B2 course.

CERTIFICATIONS

Fundamentals of Accelerated Computing with CUDA C/C++, *NVIDIA Deep Learning Institute (DLI)* **March 2023**

Fundamentals of Accelerated Computing with CUDA Python, *NVIDIA Deep Learning Institute (DLI)* **July 2022**

Building Intelligent Recommender Systems, *NVIDIA Deep Learning Institute (DLI)* **June 2022**

Fundamentals of Deep Learning, *NVIDIA Deep Learning Institute (DLI)* **May 2022**

TensorFlow: Advanced Techniques, *Coursera* **March 2022**