Karim Ben Amara

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Education

National School of Computer Science

September 2020 - June 2023

Email: karimbenamara91@gmail.com

Computer Science Engineering Degree; Operations Research and AI field Awarded graduation prize for achieving 1st place Manouba, Tunisia

Preparatory Institute for Engineering Studies of Bizerte

September 2018 – June 2020

Preparatory Diploma in Math and Physics; Linear Algebra - Advanced Calculus - Physics Ranked top 15% at the National Exam

Bizerte, Tunisia

Experience

Cognira July 2023 – Present

Software Engineer: Scala - Gatling - Akka Http - Akka Streams - Spark - Python - Cassandra

Tunis, Tunisia

- Benchmarked and analyzed the calculation engine's performance, optimizing it to handle and sustain three times more load by building an internal app to extensively profile the system without introducing any significant latency.
- Significantly enhanced the notifications workflow, resolved all related issues, and decreased their latency to sub-milliseconds.
- Took the initiative in building a command-line interface that also serves as an internal dev tool, assisting the team in validating, debugging and working on new features efficiently.
- Implemented a configurable postgres data loader and inntegrated it as a kubernetes job.

Cognira February 2023 – June 2023

End of Studies Intern: Scala - Akka Http - Akka Streams - Cassandra - Redis - Python

Tunis, Tunisia

- Benchmarked different caching strategies, measuring server throughput, time to first byte, latency, cache hit & miss rates, database read and write response times...
- Developed and implemented the testing app and various caching strategies, resulting into 18 different configurations.
- Used Python to implement user behavior simulator to apply different kind of workloads on the system.
- Automatic report generation and ranking justified with figures of harvested metrics during simulation.

Cognira June 2022 – August 2022

Backend Team Intern: Scala - Spark - Akka Http - Html - Canvas

Tunis, Tunisia

- Leveraged spark lazy transformations to develop an efficient and generic hierarchy data generator.
- Accelerated the dev team implementation and testing phases by providing a web interface to easily input and validate a hierarchy configuration with the ability to download generated data.

Projects

Freelancing Platform Sep 2024 – Ongoing

Rust - Sveltekit

- Studied functional requirements and designed data model of the system.
- Integrated a real-time scalable in app messaging capabilities.
- Implemented a scalable search engine to filter down postings and profiles.
- Extracting context from job description for semantic searches.

Expenses Tracker App 😱

June 2023 - Sep 2023

Flutter

- Started an open source project and implemented key features such as ability to add a new expense or income, tag an "item", view current balance, aggregate expenses by item and by month for a more statistical view, compute average daily and monthly expenses.
- Integrated firestore database to backup user's data at will.
- Added CI github workflow to build artifacts on merging.

Single Machine Scheduling Problem (

Dec 2022 – Jan 2023

Python

• Implemented brute-force deterministic approach for small number of jobs. Branch&Bound approach using EDD (earliest due date) with one problem constraint relaxed (EDD with job preemption as a heuristic function to limit the search space), comparing these approaches with meta-heuristic Ant Colony Optimization and Genetic Algorithm.

Artificial drone pilot ?

Dec 2022 - Jan 2023

Python - Pygame - Genetic Algorithm - Neural Networks

- Implemented a bare bone neural network optimized by a genetic algorithm.
- Implemented the simulation environment (the physics of the drone, rotation, movements, animations and collision) where the neural network was trained to manoeuvre the drone and hold still.
- Analysed different methods of the evolution (crossover, mutation...) and plotted the error variation of the average population.

Ant Colony Optimization simulation (7)

Mai 2022 - June 2022

Javascript - Html

- Designed and implemented ant colony optimization meta-heuristic approach solving particularly the Travel Salesman problem.
- Added key features for the user to extract meaningful results, ability to tune parameters and observe changes in real-time.
- Levereged the canvas html element to draw algorithm's steps in real-time. Highlighting pheromone trails, best path found yet, current and best found score.

Achievements

- Took role within the Google Developer Groups of Manouba where I helped organizing various events (Women Techmakers Google DevFest...) and exposing newcomers to the state of the art of Google technologies specifically.
- Google machine learning course: Linear Regression Image Classification.
- Google could badge: Create and manage cloud resources (Virtual machines, Docker, Kubernetes, Nginx).
- Completed Introduction to TensorFlow for Artificial Intelligence, Machine Learning and Deep learning on Coursera. DeepLearning.AI Year 2021

Skills

Developer Tools: Docker - Kubernetes - Git

Areas of Expertise: Software Architecture And Development - Data Structures - System Design - Networking Languages & Technologies: Scala - Python - Bash - Awk - Javascript - C/C++ - Dart - Rust - Spark - Svelte - Flutter