

Dhimitrios Duka

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EXPERIENCE

Software Engineer

Aug. 2023 – Oct. 2023

Sciant

Tirana, AL

- Worked on an integration project for Protel, utilizing Amazon S3 and Spring Boot as the backend framework, with DynamoDB as the database.
- Accomplished seamless data integration, and performance optimization, and maintained comprehensive documentation.

Software Engineer

Aug. 2021 – Jul. 2023

DigitSapiens

Tirana, AL

- Developed and maintained the Unified Patent Court e-justice system, which digitalizes the process of deciding on the infringement and validity of Unitary Patents and classic European Patents.
- Demonstrated expertise in identifying and resolving bugs resulting in significant performance gains.
- Successfully ported an existing monolith to a microservices architecture for an internal project, resulting in improved scalability and maintainability.

Software Engineer Intern

May 2021 – Jun. 2021

ikubINFO

Tirana, AL

- Designed and implemented an application leveraging a Model-View-Controller architecture.
- Utilized Spring Boot, and its complementary frameworks for the back-end and Thymeleaf for the front-end development.

EDUCATION

Saarland University

Master of Science in Computer Science

Saarbrücken, DE

Oct. 2023 – Present

Polytechnic University of Tirana

Bachelor of Science in Computer Science

Tirana, AL

Oct. 2018 – Mar. 2022

Thesis: A Neural Image Caption Generator for the Albanian language.

Supervisor: Evis Trandafili

TECHNICAL SKILLS

Languages: Python, Java, C++, C, Javascript, TypeScript, SQL, L^AT_EX

Frameworks: PyTorch, SpringBoot, Flyway, JUnit, Mockito, Thymeleaf, NextJS

Developer Tools: Git, Docker, Amazon Web Services

Libraries: Transformers, Torchvision, Scikit-Learn

PROJECTS

Acoustic Guitar Chord Recognition | *Computer Vision* [link]

Jun. 2024 - Aug. 2024

- Developed a system for automatic chord recognition of acoustic guitar notes from a video.
- Explored hand pose estimation as an alternative method for chord recognition.
- Utilized YOLO and Faster R-CNN for fretboard detection, and Vision Transformers and DINOv2 for chord classification.
- Outperformed existing methods in accuracy and overall performance.

Multilingual Language Model Fine-Tuning | *NLP* [link]

March 2024

- Analyzed the impact of various fine-tuning methods (Full fine-tuning, BitFit, LoRA, IA3) on language models, particularly on underrepresented languages like *qyqy_Latn*.
- Compared the performance of pre-trained models such as XGLM-564M and GPT-2 on multilingual datasets, including NLLB, and evaluated their hidden representations.

- Implemented methods such as PCA and t-SNE for visualizing the hidden states of tokens and sentences in multilingual representation spaces.
- Evaluated the performance trade-offs of parameter-efficient fine-tuning techniques.

Zeus | *Computer Graphics* [link]

Oct. 2023 – Feb. 2024

- Developed Zeus, a ray tracer utilizing the Lightwave framework, as the final project for the Computer Graphics course at Saarland University.
- Implemented various rendering techniques, materials, and camera functionalities.
- Utilized acceleration structures and parallel execution for performance optimization.

SSVEP-based Game Control System | *Brain-Computer Interface*

Oct. 2023 – Feb. 2024

- Developed a Brain-Computer Interface system under the German Research Center for Artificial Intelligence that allows control of a simple game using Steady-State Visual Evoked Potentials.
- Utilized EEG signals and implemented signal processing techniques to detect user responses.

Image Caption Generator | *Computer Vision, NLP* [link]

Sep. 2021 – Mar. 2022

- Built and trained a machine-learning model for automatically generating image captions in Albanian.
- Leveraged an existing dataset with English captions and employed a pre-trained Neural Machine Translation model to translate the captions to Albanian.
- Utilized an existing Encoder-Decoder architecture.

AWARDS & HONORS

Rendering competition, 1st place | Winner of the Computer Graphics rendering competition at Saarland University in the 2023-2024 winter semester.