Matej Ciglenečki

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Machine Learning engineer with over two years of experience, highly interested in Computer Science, Machine Learning, and Data Science. I'm a strong communicator who can present findings clearly and understandably. Throughout my work and academic experience, I've developed excellent problem-solving capabilities accompanied by a strong sense of ownership.

Experience

Microblink – **Machine Learning Intern**   Feb 2023 – present
- Implemented a font image classifier via semi-supervised learning (**PyTorch**) and a naive font image classifier (**OpenCV**).
- Modified Neural Radiance Field to support segmentation mask generation via supervised learning. Validated the model's ability of view interpolation, extrapolation, mesh reconstruction, and generalization on multiple scenes. Created a controlled environment and numerically validated model's dependence on the scene's variability and number of images (**PyTorch**).
- Wrote a master's thesis on Neural Radiance Fields in collaboration with the company (**LaTeX**).

Photomath – **Software Engineer Intern**   July 2022 – Oct 2022
- Developed and deployed cloud services that parse, transform, enrich and deliver millions of events used for verifying Photomath's core regression tests (**Python, GCP, Datastream, Pub/Sub, Dataflow, Cloud Run, GitHub Actions**).

Memgraph – **Software Engineer**   Oct 2020 – Oct 2021
- Designed a **PostgreSQL** database schema and wrote feature specifications for Memgraph Cloud platform. After successful implementation, the platform achieved 300% user growth in the first month.
- Implemented Memgraph Cloud's backend (**node.js, TypeScript, Express, Sequelize, PostgreSQL**) that supports 400+ active users, manages **AWS EC2** instances, and supports monthly user billing based on user usage.
- Set up **Elastic Stack** on **AWS EC2** to analyze application logs (**AWS CloudWatch**) in **Kibana** dashboards.

Memgraph – **Software Engineer Intern**   July 2020 – Oct 2020
- Implemented geographic graph data visualization in Memgraph Lab (**TypeScript, Leaflet**).
- Refactored codebase via design patterns (**TypeScript**).

Skills

Languages:	**Python, C++, R, SQL, bash, TypeScript**
Technologies:	**git, Linux, PyTorch, scikit-learn, GCP, AWS, FastAPI, PostgreSQL, Docker, Elastic Stack, OpenCV**
Other:	**Machine Learning, Data Science, Computer Vision, NLP, Data Structures, Algorithms, Statistics, OOP**

Education

M.Sc Data Science, B.Sc Computer Science – Faculty of Electrical Engineering and Computing, Zagreb   2017 – 2023
relevant courses: Machine Learning, Deep Learning, Statistical Data Analysis, Multivariate Data Analysis, Deep Generative Modeling, Probability and Statistics, Artificial intelligence, Advanced Algorithms and Data Structures, Object Oriented Programming, Design Patterns, Advanced Operating Systems, Parallel Computing, Business Intelligence, Numerical Mathematics, Signal Processing, Data Visualization

Projects

LUMEN Data Science competition – 2nd place – Musical Instrument Labeling   2023
- Led a team of four**.** The goal was to create a model that labels 11 musical instruments for a given audio signal.
- Achieved 1st place in model performance with an F1 of 0.70 on the test set.
- Used **Python**, **PyTorch**, deep learning, digital signal processing, audio feature engineering, and computer vision to create image representations for raw audio and train CNN and transformer which label musical instruments of unseen audio signal.
- Implemented a **FastAPI** server that allows inference on a trained model.
- Wrote project documentation and technical documentation.

A Squeeze of LIME, a Pinch of SHAP – an NLP paper   2023
- Wrote and published an NLP paper with two other authors.
- Optimized DeBeRTa model to binary classify whether the sentence makes sense with an F1 of 0.863 on the test set.
- Analyzed explainability of the trained model with LIME and SHAP, model-agnostic and post-hoc methods.

LUMEN Data Science competition – finalist – GeoGuesser AI Agent   2022
- Led a team of three**.** The goal was to predict the location of 64 000 Google Street View images in Croatia.
- Achieved 2nd place in model performance with a mean error of 22km, measured as the great-circle distance.
- Used **Python**, **PyTorch**, deep learning, geospatial feature engineering and computer vision methods to transform geographic data, process images, train multiple models and predict locations of unseen Google Street View images.
- Implemented a **FastAPI** server that allows inference on a trained model.
- Wrote project documentation and technical documentation.

Implementation of driver fatigue detection in an EEG-based system – Data Science course project   2022
- Successfully reproduced results and methods described in the research article with **Python**.
- Performed data analysis and feature extraction on the driver's EEG data. Processed 7200 seconds worth of EEG data.
- Trained 4 different models, successfully predicted driver's fatigue with **scikit-learn** with +99% accuracy, and achieved 1% better results compared to the research article.

AI BattleGround hackaton – AI Agent   2022
- Worked in a team of four. Implemented a software agent in **Python** which plays against other agents in a turn-based game. Agents communicate via a streaming protocol, and based on the game's state the agent tries to perform the optimal move (*attack*, *switch characters,* or *use an item*). The game consists of multiple different characters, actions, and modifiers.

Student success analysis – Statistical Data Analysis course project   2022
- Led a team of four in the Statistical Data Analysis course project written in **R**.
- Analyzed student success data with the following statistical methods: t-tests, chi-squared tests, Fischer's test, normality tests, f-tests, ANOVA, and linear regression.
- Wrote a final report which describes the theory and the context of used statistical methods used in the project.

DataCrunch – Data Science Academy   2019, 2018
- Predicted next year's bankruptcy of Croatian companies with machine learning techniques written in **R**.

AG04 – Spring Boot Summer School 2019
- Developed a web application with **Java Spring** in a group of 5 and completed a Java Spring course.