Tomislav Rekic

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An experienced Machine Learning engineer with a master's degree in robotics & AI. Skilled with both traditional and deep Machine Learning and Computer Vision algorithms. Primarly focused on Python, Pytorch and Linux. Learning MLOps.

Education

Faculty of Electrical Engineering, Computer Science and Information Technology Osijek

Osijek, Croatia

- Master's degree in Robotics and Artificial Intelligence

  Graduate University Study Programme in Computer Engineering - Robotics and AI — *Oct 2019 - Sep 2022*
- Bachelor's degree in Computer Science

  Undergraduate University Study Programme in Computer Engineering — *Jul 2016 - Sep 2019*

Work Experience

Protostar Labs

Osijek, Croatia

Machine Learning Engineer — *Aug 2021 - Jun 2023*

- Developed automated visual quality inspection systems using **Machine Learning**, **Computer Vision** and **Image Processing** algorithms. Systems were deployed on **edge devices**. Clients were satisfied and have reported reduced downtime in manufacturing.
- Created custom data-sets. Utilized data preparation, feature engineering, data annotation and data augmentation, keeping best practices in mind. Evaluated machine learning models, expanded data-sets and modified model architecture to achieve desired results.
- Worked on drone vision systems: detecting warehouse objects; SLAM; reading QR-codes, bar-codes and ArUco markers.
- Created an API for GPS devices using **Flask**. This API served GPS information to the land-survey system. Wrote **Bash scripts** for automating the connection and start-up process. Acquired extensive knowledge about the GPS.
- Daily usage of tools such as: **Git**, **Jira** and **BitBucket**.

Protostar Labs

Osijek, Croatia

Machine Learning Engineer Intern — *Sep 2020 - Nov 2020*

- Developed multiple **computer vision** algorithms for detecting faults on MDF boards for Iverpan and rated their performance. Algorithms ranged from classical to deep learning methods.
- Created a custom data-set and trained a **YOLOv5** network to detect products with missing top covers.
- Implemented the **Mask RCNN** to train and run interference on custom synthetic Fruits data-set.

Projects

Predicting fates of passengers aboard the Titanic (And MLOps around it)

Jul 2023 - present

- Used **Pandas** for data exploration and preprocessing. Utilized **MLFlow** for experiment tracking. Random Forest model was used to predict whether the passengers survived. Hyper-parameter optimization done with Optuna. Model deployed as a **Docker** container.
- Added unit testing using **PyTest**. Added Pylint checks. Written **GitHub Actions** to run unit tests and lint checks when pushing or creating pull-requests. Added **GitHub Actions** for scheduled testing.
- Lengthy learning sessions about **Kubernetes** and **KubeFlow**, and about other tools mentioned.

Robotic Palletization using Computer Vision

Feb 2022 - Sep 2022

- Master's thesis. Robotic system which detected objects, grabbed them, and placed them on ArUco markers.
- Robotic system consisted of a UR5 robot arm, a Robotiq 3-Finger gripper and Intel RealSense LIDAR camera. System was developed in **ROS**, **Gazebo** was used for simulation and **Open3D** was used for processing point clouds.

AI Agent for Pong

Jun 2020 - Jul 2020

- Trained an AI agent to play a game of Pong inside the **OpenAI Gym**. **PyTorch** was used to create the brain of the AI agent.
- Agent was initialized using Supervised Learning, and then refined using Reinforcement Learning.

Android app for animal classification

Feb 2019 - Sep 2019

- Bachelor's thesis. Made an app which uses the **MobileNetV2** CNN to classify pictures of animals.
- CNN was trained in **TensorFlow** using Transfer Learning. **TFLite** was used to run the model on Android.
- Taken pictures and other data were stored locally in a **SQL** database.