Riccardo Zuliani

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Summary

Passionate about AI/ML with a strong background in deep learning and computer vision. Skilled in Python, PyTorch, and various ML libraries. Excellent problem-solving, research, and collaboration abilities. I am a stubborn and determined person, willing to learn and test myself with new challenges to prove I am worth it.

Experience

Machine Learning Engineer & Researcher — Oct 2024 – Present
NAIS Engineering S.r.l. — *Bologna, Italy*

Probability and Statistics University Tutor — Oct 2023 – Jan 2024
University Ca' Foscari of Venice — *Venice, Italy*

- Frontal teaching is explained both via the exercises solution on the blackboard and with the use of the computer.
- Reception of students in person and by e-mail.
- Support students in the usage of R, especially in understanding the suitable tools for solving each problem.

Pizza Maker — Aug 2019 – Aug 2023
Pizzeria Irene — *Volpago del Montello, Italy*

- Spreading the doughs.
- Stuffing the pizzas.
- Management of the wood stove.

Education

University Ca' Foscari of Venice — Venice, Italy
M.S. in Computer Science, Data Management and Analytics — *Sep 2021 – Jul 2024*
Grade: — *110L / 110*

University Ca' Foscari of Venice — Venice, Italy
B.S. in Computer Science, Data Science — *Sep 2019 – Jul 2021*
Grade: — *106 / 110*

Language Skills

Italian — Mother tongue
English — B2, intermediate

Technical Skills

Programming Languages: Python, C, C++, SQL, Java, PHP, F#, R.

Deep Learning Frameworks: PyTorch.

Libraries & Tools: NumPy, Pandas, Scipy, Scikit-learn, Matplotlib, Seaborn, OpenCV, NLTK, Git, Boost Graph Library (C++), Angular, MongoDB, Express and Hugging Face.

Projects

Active Learning strategy using Graph Transduction Game Oct 2023 – Present
Active Learning Master's Thesis Project *Python, PyTorch, matplotlib, seaborn*

- Combination of Active Learning and Graph Transduction Game.
- Graph Transduction Game formulates the classification task as an evolutionary non-cooperative game between N players (samples) with M strategies (labels).
- To this end, the selection of samples to be labelled in the AL model, is based on:
  - Tracking the evolution of the entropy along the iteration of the aforementioned dynamical system.
  - Creating an ad-hoc payoff function s.t. similar samples (already seen) are discouraged to emerge in the subsequent iterations.

CBERTdp: Clustering BERT Embedding via Dot Product Nov 2023 – Feb 2024
Natural Language Processing Project *Python, PyTorch, NLTK, Hugging Face, BERT, Dot Product*

- Leveraging BERT-extracted embedding and clustering techniques to streamline the sentiment classification process.
- Cluster BERT embedding and classify sentiment by computing the dot product between a new sentence embedding and cluster centroids.

NYC Fire Incident Dispatch Analysis Oct 2023 – Jan 2024
Statistical Inference Project *R, R-Studio*

- The Fire Incident Dispatch Data file contains data that is generated by the Starfire Computer Aided Dispatch System.
- It covers information about the incident related to the assignment of resources and the Fire Department response to the emergency.
- Two analysis are proposed:
  - Predict the INCIDENT_RESPONSE_SECONDS_QY which is the time difference between the FIRST_ON_SCENE_DATETIME and INCIDENT_DATETIME.
  - Predict the EMERGENCY_TIME which is the time difference between the FIRST_ON_SCENE_DATETIME and INCIDENT_CLOSE_DATETIME.
- Starting from linear regression we change the task formulation to binary classification since the linear assumptions were not satisfied.

PageRank & HITS Comparison Benchmark Jun 2023 – Sep 2023
Information Retrieval Project *C++*

- Compare the prestige computation of given pages graph using an implementation of PageRank and HITS.

Silhouette-based space carving Jun 2023 – Sep 2023

Computer Vision Project *Python, OpenCV, Numpy*

- Implement a technique known as "space carving" to reconstruct the shape of a 3D object from multiple photographs taken at known but arbitrarily distributed viewpoints.
- An object is placed on top of a rotating plate together with a custom-designed fiducial marker.
- A calibrated camera is placed in front of the object capturing the scene throughout an entire rotation.
- The volume occupied by the object is represented by a discrete set of voxels distributed on a cube of size $N \times N \times N$.
- At each frame, a set of 3D rays exit the camera starting from the optical center and passing through each pixel of the image.
- If a ray reaches the background without touching the object, all the intersected voxels can be "carved".
- If a ray reaches the object, at least one of the intersected voxels is part of the object, so they must not be removed from the set.

Video Classification with Convolutional Neural Network Jun 2022 – May 2023

Deep Learning Project *Python, PyTorch, OpenCV, YoutubeDL*

- Lite version of the following paper: Large-scale Video Classification with Convolutional Neural Networks.
- Implementation of approaches for extending the connectivity of a CNN in the time domain to take advantage of local spatiotemporal information and suggest a multiresolution, foveated architecture as a promising way of speeding up the training.

Maximum Weighted Matching VS Auction Algorithm Jun 2022 – Sep 2022

Advanced Algorithm Project *C++, Graph Boost Library*

- Comparison of implementation of Auction Algorithm and the Maximum Weighted Matching from the Boost Graph Library.

Dash AutoML Benchmark Jan 2021 – Sep 2021

Bachelor's Thesis Project *Python, Dash, Numpy, scikit-learn*

- Benchmark for some automated machine learning: AutoSklearn, MLJAR, H2O, TPOT, and AutoGluon.
- All visualized via a responsive Dash Ploty Web Application.