DARIO CIONI

AI Researcher · Machine Learning Engineer

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WORK EXPERIENCE

AI Developer @ AI Center of Excellence — **PwC**, Milan, Italy

Python | LLMs | RAG | FastAPI — Jul. 2024 - Present

- Developed and optimized 3 Retrieval-Augmented Generation (RAG) pipelines leveraging Large Language Models (LLMs)

Research Assistant @ MMV group — **Queen Mary University of London**, London, UK

Python | Pytorch | Generative Models | Deepfake Detection | Vision Foundation Models — Oct. 2023 - June 2024

- Research on Synthetic Image Attribution under the guidance of Prof. Ioannis Patras and Dr. Christos Tzelepis to be published at TWYN@ECCV2024

ICT Consultant, Software Developer — **Hermes Trade s.r.l**, Florence, Italy

SQL | ASP.Net | Python | Angular | Hitachi Pentaho — Aug. 2015 - Sep. 2021

- Designed and followed the development of an ERP/CRM application as Database Developer and Backend Developer for 5 main clients, managing all phases of software development lifecycle and cutting support costs by 30 %
- Worked as Product Owner in an Agile team of 8 people, translating clients' needs into actionable User Stories
- Built an ETL pipeline (Pentaho DI) for continuous database update during the migration phase, increasing velocity by 50%

EDUCATION

M.S. in Artificial Intelligence — **University of Florence**

110/110 with Honour (First Class Honours) — Sep. 2021 - Apr. 2024

- Thesis: "Forensic Techniques for Detection and Attribution of Synthetic Images"
- Main subjects: Deep Learning, Statistical Learning, Data Mining, Computer Vision, Generative Models, Big Data Architectures

B.S. in Computer Science and Engineering — **University of Florence**

Thesis "Convolutional Neural networks for Object counting in thermal imagery" — Sep. 2015 - Apr. 2021

- Performed transfer learning on features extracted by a YOLOv3 network trained on thermal imagery of different domains
- Main subjects: Databases, Algorithms and Data Structures, Artificial Intelligence, Theory of Computation, Software Engineering

ACHIEVEMENTS

ISO 56000 Innovation Management — **Florence**, Italy

Completed Innovation Management course, presenting at Adriano Olivetti's 120th anniversary day seminar held in Florence — Jan. 2022

PROJECTS & PUBLICATIONS

Are CLIP features all you need for Universal Synthetic Image Origin Attribution? — **TWYN @ ECCV 2024**

Python | Deepfake Detection | Open Set Recognition | Vision Foundation Models — ciodar/UniversalAttribution

- Leveraged Vision Foundation Models to perform Open-Set Attribution of Diffusion-generated synthetic images, resulting in a 20% increase in Open Set OSCR and a 5% rise in closed-set accuracy compared to existing baselines

Diffusion Based Augmentation for Captioning and Retrieval in Cultural Heritage — **ICCV 2023 4th Workshop on e-Heritage**

Pytorch Lightning | Python | Diffusion Models | Transformers | Image Captioning | Image Retrieval — ciodar/cultural-heritage-diffaug

- Used Diffusion models to perform 8x augmentation of Cultural Heritage datasets for Image Captioning and Retrieval

Deep Compression — **Paper replication**

Pytorch Lightning | Python | Neural Network Compression | Image Classification — ciodar/deep-compression

- PyTorch Lightning replication of "Deep compression: Compressing deep neural networks with pruning, trained quantization and huffman coding" - Song Han et al., 2015
- Obtained paper results within 1% error on smaller-scale datasets, replicating from scratch the 3-step procedure described in paper

Deep Learning Portfolio — **Paper replication**

Pytorch | Python | Image Classification | Natural Language Processing | OOD-Detection — ciodar/deep-labs

Collection of Deep Learning projects replicating results of foundational papers in each area

- **Image Classification**: Replicated small-scale results of ResNets, Image Localization through Fully Convolutional networks and Class Activation Maps
- **Natural language processing**: Sequence prediction, Sequence generation and Question Answering with Transformer nets
- **Adversarial Learning & OOD Detection**: Out-Of-Distribution detection, evaluated FGSM attack and trained an image classification network for robustness against adversarial attacks