

EMANUELE VIVOLI

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EDUCATION

Ph.D. student | *University of Florence (Florence, Italy) + CVC (Barcelona, Spain)* **Nov. 2022 – Ongoing**

- Won as 1^o position 2 scholarships among Florence, Siena and Pisa students to pursue my PhD.
- Research on "Vision and Language", scene-text VQA, Hateful memes, Knowledge base, etc.

Erasmus+ student | *Faculdade de Ciencias e Tecnologia (Lisbon, Portugal)* **Sep. 2019 – Feb. 2020**

- Learned B2 Portuguese from zero in 2 months and completed 4 exams, each with a grade of 30/30
- Led 3 teams of 2 to 4 people to develop projects for the exams (projects on GitHub)

Master in Computer Engineering | *University of Florence (Florence, Italy)* **Dec. 2018 – Jul. 2021**

- GPA: **29.375/30** - Final grade: **110/110 with honours**
- Thesis on: "Semantic understanding of scientific papers"

Bachelor in Computer Engineering | *University of Florence (Florence, Italy)* **Sep. 2015 – Dec. 2018**

- GPA: **28.407/30** - Final grade: **110/110 with honours**
- Thesis on: "Handwriting Recognition and Classification"

PUBLICATION

MUST-VQA | *ECCV - Workshop* **Oct. 2022**

- "MUST-VQA: on Multilingual approaches for Scene-text and Text VQA".
- **E. Vivoli**, A.F. Biten, R. Tito, A. Mafla, D. Karatzas, L. Bigorda

GNNs for Table Extraction | *ICPR - Conference* **Jul. 2022**

- "Graph Neural Networks and Representation Embedding for Table Extraction in PDF Document"
- A. Gemelli, **E. Vivoli**, S. Marinai.

EXPERIENCE

Research Fellow | *University of Florence (Florence, Italy)* **Jul. 2022 – Ongoing**

- Won two years fellowship aiming at finding archeological sites and unexploded anti-person mines under the ground.
- Self navigating robot and holeographic radars are involved.
- Main tasks: dataset creation; object classification and anomaly detection models; prototyping and deployment.

Intern student | *Computer Vision Center, UAB (Barcelona, Spain)* **Mar. 2022 – Jul. 2022**

- Paper accepted at **ECCV2022**
- Under supervision, have been designed, implemented and structured the experiments. Used MMF framework together with HF Transformers.

Research Fellow and TA | *University of Florence (Florence, Italy)* **Aug. 2021 – Mar. 2022**

- Paper accepted at **ICPR2022**
- Speeded up paper code of x7.5 (data preprocessing and training) by refactoring and using Torch Tensors

Full-stack Developer Freelancer | *Multiple companies (Florence, Italy)* **Feb. 2020 - Dec. 2021**

- Developed 3 web applications for real-time data management (i.e. doctor appointments and receipts)
- Supported 80 doctors, 1500 patients each with low latency and real-time updates
- Tools: Angular2+, rxjs, ngxs/ngrx, Google Cloud Platform (Firestore, Cloud Functions, Security Rules)

Intern student | *Luleå Tekniska Universitet (Luleå, Sweden)* **Jun. 2019 – Aug. 2019**

- Found and fixed a bug in a paper code about EEG Analysis for intent classification
- Gave workshops on "git and vscode for remote programming" and "web services with Angular2+"

Tutor (TA) | *University of Florence (Florence, Italy)* **Jan. 2019 – Feb. 2019**

- Tutor experience working with 20+ High school students and 3 other tutors
- Designed 2 weeks of frontal and interactive lessons on python, jupyter notebooks, opencv and decision tree

SKILLS

Programming languages: Python, Matlab, Typescript, JavaScript, Java, C/C++, C#, R

Data science libraries: PyTorch, TensorFlow, huggingface, fast.ai, Scikit-learn, Numpy, Pandas, OpenCV, WandB

Other technologies: Linux, git, vscode, GitHub, GitLab, Docker, L^AT_EX

Languages: Italian [native], English [IELTS 6.5], Portuguese [B2], Spanish [B1]

PROJECTS

- Person tracking on the edge (Jetson Nano) | (void)** **Sep. 2022 - Ongoing**
- After 6 month of design and study, me and 2 colleagues are creating a PoC product for Person Tracking using low quality cameras and Jetson Nano.
- MUST-VQA on MMF + Huggingface | (void)** **Mar. 2022 - Jul. 2022**
- Reimplemented LaTr model in MMF and Huggingface. Created multilingual ST-VQA and TextVQA dataset for MMF. Designed runs for LM such as byT5 (base, large) and T5 (base, large) and customized positional OCR encoder.
 - Designed models and experiments, wrote paper.
- GNN for Table Extraction | (void)** **Sep. 2021 - Jan. 2022**
- Created custom library for deep learning on graph and documents
 - Designed dataset fusion, models, and experiments
- Semantic understanding of scientific papers | 30/30 with honors** **Dec. 2020 - Jul. 2021**
- Created custom deep learning library for dataset, models and pipelines managing (based on huggingface and cogdl)
 - Designed parallel experiments speeding up 10x training (pytorch and Weights&Biases)
- Jpeg Decompression GAN | 28/30** **Nov. 2020 - Jan. 2021**
- Defined a custom loss and empirically demonstrated its proportionality to SRGAN loss
 - Weekly documented the project
- Algorithm and Distributed Systems | 30/30** **Sep. 2019 - Jan. 2020**
- Developed a publish/subscribe system based on Topics using paxos and multi-paxos protocols in java (from scratch)
 - Monthly reported modifications to the algorithm, convergence and reliability (in Portuguese with 2 team members)
- EEG analysis | (void)** **Jun. 2019 - Aug. 2019**
- Designed and applied LSTM on EEG streams represented as images
 - Resolved a bug on the author's paper's code on GitHub (their results were wrong)
- Hyperparameters (global) Optimization | 30/30 with honors** **Jan. 2019 - Feb. 2019**
- Comparison of Radial Basis Functions and Bayesian Gaussian processes Hyperparameters optimization algorithms
 - Empirically discovered that RBF drives to lower score for objective function (loss) and higher accuracy
- Handwriting Recognition and Classification | 30/30 with honors** **Jun. 2018 - Oct. 2018**
- Creation of Dataset of 100+ children from 6 to 12 yo, designed and trained CNN and MLP networks for classification task (dysgraphia/not-dysgraphia) .
 - Definition of BHK method with manually extracted features from online handwriting and MLP classification
 - Empirically proved that MLP on BHK manually extracted features works better than CNNs

GRANTS / AWARDED

- Research Fellowship | two slot of €30000/y** **Jul. 2022 - Ongoing**
- Won the only scholarship emitted for project ASMARA described at sec. Experience.
- Intern Grant | two slot of €2000** **Mar. 2022 - Jul. 2022**
- Three months of Intern scholarship in support of research on VQA.
- Research Grant | two slot of €6000** **Aug. 2021 - Mar. 2022**
- Six (+ other six) months of Research fellowship in support of research on Document Analysis using NLP and GNNs.
- Erasmus scholarship | €750/month** **Sep. 2019 - Feb. 2020**
- Six months Erasmus scholarship (both from University and DSU) of €750/month for economic and credit reasons.

LEADERSHIP / EXTRACURRICULAR

- Handyman | VW LT 28 Owner** **Jul. 2019 - Ongoing**
- I bought a "VW LT 28" from the back eighties and I started restoring it from 0 without experiences. I used most of my spare time learning handyman skills and applying them to the restoration. In August 2021 I eventually I arrived in Sicily by road driving almost 4000 kilometres on my van. It was one of the greatest satisfactions to have succeeded in.
- Agesci | Scout group Co-head** **Sep. 2020 - Oct. 2022**
- Co-head of a group formed by 30 children from 8 to 12 that meet every weekend doing activities together such as games or hiking. Since I was 8 to 19 I was in the same scout group.
- Onlus Merveilles de Dieu | Onlus Co-head** **Aug. 2016 - Mar. 2020**
- Starting from my volunteering experience in Benin, we raised an ONLUS for the village of Tokan, in Benin (Cotonou) and every year we organize stalls and charity dinners to collect money for the village. Every dinner we fed more than 200 people
- Parish | Group Co-head** **Aug. 2013 - Aug. 2019**
- Every summer I volunteered as co-head of a Parish group with more than 25 children escaping monotony and hustle for a week. The work begins months before where we start looking for a camp's topic, programming activities, games and writing screenplays on that theme for give the children a moral