Pedro Gomes

Permission to work: UK (pre-settled), Europe

+44 7770344867 | uceepdg@ucl.ac.uk | 14/10/1996 | pedro-dm-gomes.github.io/ | Based: UK, London, SW15

Summary

I am a final-year Ph.D. student at the University College of London. My area of expertise is developing graphs-based neural networks to model complex systems of relations or interactions.

Education

University College London — ***London, UK***

PhD Student in graph-based machine learning (Final Year) under supervision of Dr.Laura Toni. — *Mar. 2020 - Mar.2024*

University of Coimbra & Politecnico di Torino — ***Coimbra, Portugal, & Torino, Italy***

Master in Computer Science. — *Mar. 2020 - Dec.2019*

University of Coimbra — ***Coimbra, Portugal***

Bachelor in Electrical and Electronic Engineering. — *Set. 2020 - Mar.2024*

Work Experience

Nomura - Instinet, Intern at Trading and Development Team — ***London, UK***

- Investigated and designed algorithms for latency-sensitive electronic trading.
- Focused on learning graph representations of circuit topology for placement and routing optimization. — *June. 2023 - Aug. 2023*
- Skills used were Python, Algorithm Optimization, VHDL and Verilog.

DSTL: Defence Science and Technology Laboratory, Consultant — ***Salisbury , UK***

- Taught practical machine learning at DSTL on how to design and develop computer vision models. — *Mar. 2020 – Apr. 2020*

University College London, Teaching Assistant — ***London, UK***

- Taught *Digital Signal Acquisition and Processing* and *Applied Machine Learning* Master degree courses, as well as supervised several final year projects. — *Apr. 2022 - Oct. 2022*

Institute of Telecommunications (IT), Research Assistant — ***Coimbra, Portugal***

- Research assistant funded by FCT grant to work on the compression of LightField Images. — *Aug. 2020 – Aug. 2020*

Research

Point Cloud Motion Forecasting via Graph-based Machine Learning — ***London, UK***

- Publications: International Conference on Image Processing (ICIP) and ACM Transactions on Multimedia Computing (ACM TOMM) (accepted, First Author).
- Creation of a synthetic dataset of point clouds by manipulation of FBXs animations using Blender.
- Deployed a graph-bse network able to extract relevant information from unstructured data extract and predict the dynamic behaviour (motion) of point clouds — *Feb. 2020 - Dec. 2023*
- Skill used: TensorFlow/PyTorch, sampling, grouping and matching techniques for 3D geometry.

Millimeter-wave data processing via Graph-based Machine Learning — ***London, UK & Bari, Italy***

- Pending publication (First Author) in collaboration with Politecnico di Bari (Italy).
- Creation of novel and unique large-scale dataset of 3D indoor scenes via a robot coupled with low-cost millimetre-wave radar.
- Development of a full pipeline process 3D millimetre-wave point clouds (highly sparse and noisy). — *July. 2022 - Dec. 2023*
- Investigated the performance of ML frameworks (PointNets, GNNs, Transformers) designed for classic point clouds in mmwave point cloud
- Proposed a novel architecture of graph-based transformer tailored for mm-wave point clouds.

Machine Learning Explainability — ***London, UK***

- Publications at ACM Multimedia Systems (MMys), Picture Coding Symposium (PCS) and Graph Signal Processing Workshop (GSPW)
- Development of techniques for feature disentanglement and visualization to gain an understanding of the inner workings of neural networks. — *Dec. 2022 - Jul. 2023*

Scalable Coding of LighField Images via Pseudo-Sequences — ***Coimbra, Portugal***

- Publication at European Workshop on Visual Information Processing
- Developed of light-field image encoding method using HEVC video coding. — *May. 2019 - Nov. 2019*

Awards

- Merit Award given to the top (3%) best students of each course at the University of Coimbra.
- Best Doctoral Symposium Paper Award at ACM MMSys'2021.

Committees

- Reviewer for IEEE Transactions on Image Processing (TIP), ACM International Conference on Multimedia (ACM MM) and IEEE International Conference on Image Processing (ICIP)

Skills

- **Programming Languages:** C,C++, Python, SQL, Verilog, LINUX, Matlab, R. (Libraries: Tensorflow, PyTorch, NumPy, Pandas)
- **Multimedia Processing:** Image, Video, Mesh, Point Cloud, mmWaves, 3D graphics, HEVC, FFmpeg, Blender, OpenCV
- **Machine Learning:** Graph Neural Networks (GNN), Natural, Language Processing (NLP), Forecasting models, Explainability
- **Databases**: SQL, MongoDB, Oracle, AWS scripting/building tools
- **Electronics and Embedded systems**: Circuit design, Computer Architecture, FPGAs
- **Others:** Latex, GitHub/Git/GitLab, Jenkins, Confluence
- **Language and interests::** English (fluent), Portuguese (native) and Spanish; AI, Cinema, Stand-up Comedy, 5-aside Football.