

# MARCO LAM

Maynooth, Co. Kildare, Ireland

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## Education

### University of Padova

Padova, Italy

MSc Computer Science - 1<sup>st</sup> Class Honours

Oct 2022 - July 2024

- **Grade:** 110/110 cum Laude
- **Thesis:** Algorithmic Approach to 15 Minute City
- **Courses:** Advanced Algorithms, Big Data Computing, Concurrency & Distribution, Functional Languages, Deep Learning, Computer Vision, Natural Language Processing, Data Mining, Mobile Programming

### University College Dublin

Dublin, Ireland

MSc Data & Computational Science - 1<sup>st</sup> Class Honours

Sept 2019 - Sept 2020

- **Grade:** GPA 3.99
- **Courses:** Data Programming with C, R & Python, High Performance Computing, Machine Learning, Regression & Classification, Clustering, Numerical Algorithms, Bayesian Analysis, Stochastic Models

### University College Dublin

Dublin, Ireland

BSc Financial Mathematics - Upper 2<sup>nd</sup> Class Honours (2.1)

Sept 2015 - May 2019

- **Grade:** GPA: 3.45
- **Research Internship:** Latent Position Models
- **Courses:** Partial Differential Equations, Complex Analysis, Groups, Rings & Fields, Metric Spaces, Cryptography, Time Series, Bayesian Models, Linear Models

## Work Experience

### Allied Irish Banks (AIB)

Dublin, Ireland

Data Analyst

Sept 2020 - Sept 2022

- Managed Teradata Data Warehouse and Microsoft SQL Server databases.
- Designed and developed ETL pipelines to generate risk assessments and regulatory reports for customers.
- Experienced in pipelines and system upgrade and migration projects.
- Performed A/B testing, investigated and resolved any data quality issues.
- Replicated errors found in workflows through SQL Server Management Studio and pivot tables.
- CI/CD integration with JIRA and custom version control system.
- Hands-on experience with both Waterfall and Agile software development lifecycle models.
- Communicated with clients and business teams, translated high level requirements to technical terms.
- Created, reviewed and updated procedure documentation on Confluence.
- Provided mentorship to 3 new hires.

### University College Dublin

Dublin, Ireland

Research Intern - [github.com/marcohoucheng/Research-in-Latent-Position-Models](https://github.com/marcohoucheng/Research-in-Latent-Position-Models)

June 2019 - Aug 2019

- Research project focused on Latent Position Models supervised by Dr. Riccardo Rastelli.
- Simulated social-connection models on R using Monte-Carlo Markov Chains.
- Applied Game Theory and Bayes Risks Theory to compare and optimise statistical models.
- Revised and improved algorithms to boost performance and reduce computational costs to optimisation tools.

### Private Tutor

Dublin, Ireland

Leaving Certificate Tutor

Sept 2017 - June 2019

- Tutored for both ordinary and higher level Leaving Certificate Mathematics.
- Taught higher level Applied Mathematics as an extra subject outside of school.
- Identified the needs of the students and developed academic strategies.
- Prepared weekly plans and materials and communicated with parents to check in on the students' progress.

## Skills

<b>Programming</b>	Python, Rust, C, C++, F#, Java, Swift, Javascript, SQL, VBA, R, Matlab
<b>Frameworks &amp; Libraries</b>	Pytorch, Tensorflow, PySpark, Scikit-learn, Pandas, NumPy, Django
<b>Tools</b>	Git, Docker, CI/CD, RESTful APIs, JIRA, Confluence
<b>Languages</b>	English (Fluent), Cantonese Chinese (Fluent), Mandarin Chinese (Fluent) and Italian (A1).

# Thesis

## Algorithmic Approach to 15 Minute City

MSc Thesis - [github.com/marcohoucheng/Algorithmic-Approach-to-15-Minute-City](https://github.com/marcohoucheng/Algorithmic-Approach-to-15-Minute-City)

Jan 2024 - Jul 2024

- Provide a generalised approach to determine the “15-Minute City” in any given map or city.
- Aim to design an efficient algorithm to improve on the existing solutions in literature.
- Adapt and modify popular graph search algorithms to minimise complexity such as Dijkstra’s and Johnson’s algorithm.
- The proposed solution will be implemented in Rust as a showcase to the theory.
- **Technical Skills:** Rust, Python, Graph Search

# Projects

## Brain Tumour Segmentation Prediction

[github.com/marcohoucheng/Brain-Tumor-Segmentation-with-Computer-Vision](https://github.com/marcohoucheng/Brain-Tumor-Segmentation-with-Computer-Vision)

Feb 2024 - Apr 2024

- A pipeline computer vision deep learning model with a Convolutional-Autoencoder and a U-Net model.
- Identify the region and segmentation of brain tumours through MRI scans.
- Achieved a test accuracy of 98%.
- **Technical Skills:** Python with Pytorch, cv2, pandas, multiprocessing libraries

## Meta Functional Language Interpreter

[github.com/marcohoucheng/ML-Interpreter](https://github.com/marcohoucheng/ML-Interpreter)

Oct 2022 - Jan 2023

- Built an interpreter for a meta functional language following theoretical type inference and evaluation rules.
- Implemented with a type inference mechanism to ensure absolute type safety within expressions.
- Developed comprehensive understanding of the functioning of programming language compilers.
- **Technical Skills:** F#, functional languages

## Gran Turismo 7 Price Tracker

[github.com/marcohoucheng/Gran-Turismo-7-Price-Tracker](https://github.com/marcohoucheng/Gran-Turismo-7-Price-Tracker)

Dec 2023 - Mar 2024

- Aimed to create a solution without the requirement of creating accounts on existing services.
- Automated email service to notify dynamic in-game information updates in HTML format.
- Streamlined process to create and update local databases with a scheduled web-scraper.
- **Technical Skills:** Python with pandas, urllib, smtplib, ssl and more

## Computer Vision and Deep Learning Projects

[github.com/marcohoucheng/Computer-Vision-and-Deep-Learning](https://github.com/marcohoucheng/Computer-Vision-and-Deep-Learning)

Aug 2023 - Dec 2024

- A series of Python Notebooks showcasing studies of various computer vision and deep learning topics.
- Models implemented including SIFT, Bag of Words, CNN, Recurrent Neural Networks, LSTM, GRU, Transformers and more.
- Utilising pre-trained models such as AlexNet, GoogLeNet and ResNet.
- **Technical Skills:** Python with Pytorch, pandas, cv2 and more

# Certificates

Amazon AWS Certified Cloud Practitioner

2022

Bloomberg Market Concept

2018

# Academic Achievements

Scholarship, Education and Youth Affairs Bureau Macau

2016,2018

2<sup>nd</sup> in Mathematical Olympiad Contest at Maynooth University

2015

All Ireland Linguistics Olympiad Final Competition at Dublin City University

2015

Irish Applied Mathematics Team Quiz National Final

2014

# Interests

**Outdoor activities** Causal tennis player, I also enjoy cycling and hiking

**Motor Racing** I love the racing and the engineering development of different categories including Formula 1 and WEC

**Technology** Interested in the latest technology development especially in computer hardware and OSes