# Marco Lam

*Maynooth, Co. Kildare, Ireland*

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## Introduction

As an Irish graduate with an academic background in Maths and Computer Science, I bring a strong analytical ability and technical expertise to the table. I have industry experience as a data engineer. I have a passion for computer vision and deep learning. I am seeking job opportunities in Ireland in which I can apply my skills I have developed during my Master's degree in Computer Science.

## Education

### University of Padova
*Padova, Italy*

MSc Computer Science
*Oct 2023 - July 2024*

- **Grade:** Exp. 110/110 Laude, equiv. to $1^{st}$ Class Honours
- **Thesis** Algorithmic Approach to 15 Minute City
- **Courses:** Concurrency & Distribution, Functional Languages, Deep Learning, Computer Vision, Advanced Algorithms, Data Mining, Mobile Programming, Big Data Computing

### University College Dublin
*Dublin, Ireland*

MSc Data & Computational Science - GPA:3.99
*Sept 2019 - Sept 2020*

- **Grade:** $1^{st}$ Class Honours
- **Courses:** Data Programming with C, R & Python, Statistical Network Analysis, High Performance Computing, Bayesian Analysis, Stochastic Models, Machine Learning, Numerical Algorithms

BSc Financial Mathematics - GPA: 3.45
*Sept 2015 - May 2019*

- **Grade:** Upper $2^{nd}$ Class (2.1) Honours
- **Research Internship:** Latent Position Models
- **Courses:** Cryptography, Time Series, Bayesian Models, Partial Differential Equations, Linear Models, Complex Analysis, Groups, Rings and Fields, Metric Spaces

## Thesis

### Algorithmic Approach to 15 Minute City

MSc Thesis - 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

## Skills

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| **Programming** | Python, Rust, C, C++, F#, Java, Swift, Go, Javascript, SQL, VBA, R, Matlab |
| **Frameworks** | Pytorch, Tensorflow, PySpark, AWS |
| **Languages** | English (Fluent), Cantonese Chinese (Fluent), Mandarin Chinese (Fluent) and Italian (A1). |

## Work Experience

### Allied Irish Banks (AIB)
*Dublin, Ireland*

Data Engineer
*Sept 2020 - Sept 2022*

- Developed and managed Teradata Data Warehouse along with Microsoft SQL Server databases.
- Automated SQL ETL pipelines to generate risk assessments and regulatory reports for business teams.
- Performed A/B testing, investigated and resolved any data quality issues.
- Replicated errors found in workflows through SQL Server Management Studio and pivot tables.
- Created, reviewed and updated procedure documents for future references and provided training to new members.

**University College Dublin**  *Dublin, Ireland*

Research Intern - 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.

# Projects

### Brain Tumour Segmentation Prediction

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

### ML Interpreter

github.com/marcohoucheng/ML-Interpreter  *Oct 2022 - Jan 2023*

- An interpreter for a ML functional language following theoretical typing 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  *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  *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

# Academic Achievements

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| Scholarship, Education and Youth Affairs Bureau Macau | 2016,2018 |
| 2$^{nd}$ 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 |

# Certificates

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|---|---|
| Amazon AWS Certified Cloud Practitioner | 2022 |
| Bloomberg Market Concept | 2018 |

# Interests

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| **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 |