SU ZIJIN

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https://zizeonso.github.io

EDUCATION

University College London (UCL) London, UK

Master of Science in Physics Graduated Jul. 2026

First Class Honours

Master's thesis: Deep Learning for Radar Altimetry Echo Generation in Sea Surface Image Recognition

Advisors: *Prof. Ryan Nichol & Dr. Michel Tsamados*

Relevant Coursework: *High Level Statistical Analysis of Data, Techniques of High-Performance Computing (89/100), Physics of Exoplanets, Quantum Computation and Communication, Advanced Quantum Theory*

University College London (UCL) London, UK

Bachelor of Science in Physics Graduated Jun. 2025

Relevant Coursework: *Data Analysis and Statistics, Mathematical Methods Ⅰ & Ⅱ, Practical Machine Learning for Physicists (80.56/100), Quantum Mechanics, Electricity and Magnetism, Classical Mechanics, Statistical Physics of Matter (81/100)*

RESEARCH EXPERIENCE

Centre for Polar Observation and Modelling & Dept of Earth Sciences, UCL London, UK

Deep learning for Altimetry Echo Generation Aug. 2025-Jun. 2026

Research Assistant, Supervisor: Dr. Michel Tsamados

Publication: Deep Learning for Radar Altimetry Echo Generation in Sea Ice Surface Image Recognition (First Author, Under review, IOP: Machine Learning Earth)

- Built a paired Sentinel-3 optical–altimetry dataset over Arctic sea ice by integrating OLCI imagery and SRAL SAR waveforms through temporal-spatial co-location, waveform alignment, and quality-controlled sample construction
- Extracted waveform morphology metrics and retracker-relevant physical descriptors to quantify signal fidelity and downstream geophysical consistency
- Developed a physics-aware cGAN for reconstructing SAR altimetry waveforms from optical observations, and evaluated it using both signal-level and retracker-based physical metrics

Department of Astronomy, Tsinghua University Beijing, China

JWST Data Analysis and Modelling Jun. 2025-Dec. 2025

Research Assistant, Supervisor: Prof. Zheng Cai

- Utilised 866 JWST multi-band observational data for target selection, image registration, and noise reduction, and constructed a script that can build high quality samples list
- Extracted photometric fluxes and processed 14-band datasets in Python for physical modelling
- Performed Python-based SED fitting on multi-band photometry to estimate stellar mass, age, and star-formation rate

Department of Physics and Astronomy, UCL London, UK

CubeSat Reflectarray Antenna Design (Undergraduate thesis) Jan. 2025-Mar. 2025

Designer, Supervisor: Prof. Giorgio Savini

- Designed and optimized a reflectarray antenna for CubeSats to improve communication efficiency for educational purposes
- Implemented Python-based modelling and conducted Ansys HFSS simulations to analyse and optimize unit cell phase shifts
- Devised a full production pipeline for the reflectarray antenna in a team, ensuring repeatable fabrication
- Validated the performance of reflectarray antenna for CubeSat applications

Department of Physics and Astronomy, UCL London, UK

LHC Jet Classification Using Machine Learning Feb. 2025-Apr. 2025

Model Builder, *Supervisor: Prof. Ryan Nichol*

- Constructed a machine learning model to classify jets in the LHC experiment
- Designed a data processing pipeline, applied CNN-based classification, and confirmed the combined "Jet + CALO + Features" model which achieved top performance with 97.04% training accuracy, 0.9978 AUC, and 0.9646 F1 score

Department of Computer Science, Imperial College London WuXi, China

Multi-Label Sentiment Classification Research Jul. 2024-Sept. 2024

Team Leader, Supervisor: Prof. Björn Schulle

- Developed a sentiment classification model to address dataset class imbalance through the integration of data from GoEmotions, Sentiment140, and GPT-4 mini
- Applied advanced machine learning techniques, including FastText embedding, convolutional layers, BiLSTM, as well as attention mechanisms, to enhance classification performance by 30%
- Achieved high performance on subset metrics: 97% accuracy, 71% precision, 64.5% recall, and a 67.4% F1-score across 28 sentiment categories which surpassed baseline models

WORK EXPERIENCES

(Paid Internship) Centific Technology LTD. (APAC Headquarters) WuXi, China

Data Processing Intern Jun. 2024-Sept. 2024

- Processed backend user data for clients (Microsoft, Apple and Uber) using Pandas in Python
- Developed scripts to convert data into TXT format for manual annotation, improving efficiency by 20% and eliminating manual intervention
- Labelled and processed over 500 data points daily, including text, speech, and video files from backend systems of clients using CVAT and Label Studio
- Conducted quality checks on datasets from external providers, identifying annotation errors and enhancing overall dataset quality by 40%

Shanghai Jingqi Investment Management Co., LTD Shanghai, China

Quantitative Research Intern Jul. 2023-Sept. 2023

- Applied Python to process and analyse stock trading profit and loss data, delivering daily profit and loss predictions for purchased stocks
- Researched systematic quantitative trading strategies in Python, back-testing on historical market data, optimising risk-adjusted returns through factor modelling and execution algorithms
- Analysed two datasets, each containing over 100,000 rows, to provide daily profit and loss predictions, including anticipated price fluctuations

SKILLS & LANGUAGES

Languages: English (Advanced), Japanese (Advanced), Mandarin (Native), Cantonese (Native)

Deep Learning: PyTorch (Proficient), TensorFlow; CNNs, conditional GANs, Diffusion models, physics-aware deep learning, loss function design, computer vision, image-to-signal generation

Geophysical Data: SAR remote sensing, SAR altimetry, Sentinel-3 OLCI/SRAL, Sentinel-1,2 data, satellite image processing, radar waveform analysis, sea-ice remote sensing

Scientific Programming: Python (Proficient), MATLAB, NumPy, Pandas, SciPy, xarray, Matplotlib

Annotation & Dataset Tools: CVAT, Label Studio