

# James Wu

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## WORK EXPERIENCE

### UNIVERSITY COLLEGE LONDON

London, UK

#### Research Assistant (MSc.)

June 2022 - Present

Gaussian Wasserstein Inference in Function Spaces (WIP)

JAX, Flax, Optax

- Leveraging **generalised variational inference** in function spaces to develop **Gaussian Process classification** models for images using **infinite-width kernels** (NNGPs)

Integral Probability Metrics

JAX

- Explored kernel-based distribution discrepancies **Maximum Mean Discrepancy** (MMD) and **Kernel Stein Discrepancy** (KSD)

### REVOLUT LTD.

London, UK

#### Machine Learning Engineer

Aug 2019 - Sept 2022

Bayesian Time-Series Forecasting: Gaussian Processes

Pyro, PyTorch, BayesOpt, Airflow, GCP

- Earned rebates of \$100M+/year and ensured Revolut's profitability
- Managed global card issuance for over 20M users
- Developed a general training pipeline with **Gaussian Processes** and **Bayesian optimisation** to forecast user activity, spending, and growth
- Published models to internal **PyPi** for use across the business (i.e. liquidity forecasting for Treasury)

NLP Text Embeddings: BERT Sentence Transformers

PyTorch, MLflow, Elasticsearch, Scikit-Learn, Airflow

- Developed self-serviced customer support chatbot
- Built semantic search and intent recognition of customer chat messages with **one-shot learning** and **transformer-based embeddings**

User Behaviour: Recurrent Neural Networks

TensorFlow, PySpark, Dataproc, Airflow, GCP

- Personalised user experiences to improve retention
- Developed **LSTM** solution to predict spending behaviours at a user level
- Clustered behaviours with **t-SNE** to guide personalised content delivery

### UNIVERSITY OF TORONTO

Toronto, CA

#### Research Assistant (BAsC.)

Sept 2018 - Apr 2019

NLP for Biomedical Text

PyTorch

- Achieved state-of-the-art performance for **named-entity recognition** (NER) of biomedical literature with **transfer learning** and **multi-task learning**

### ANALOG DEVICES INC.

Toronto, CA

#### Data Scientist

May 2017 - Aug 2018

Person Tracker for In-Home Monitoring: Algorithm Analysis

openCV, Scikit-Learn

- Built a GUI to analyse and identify corner cases for **computer vision** algorithms, improving model performance by ~20%

## EDUCATION

### UNIVERSITY COLLEGE LONDON

#### MSc. Computational Statistics & Machine Learning

Expected Completion: Aug 2023

### UNIVERSITY OF TORONTO

#### BAsC. Engineering Science

Graduated with Honours

## RELEVANT STUDIES

Approximate Inference

Unsupervised Learning

RKHS's in Machine Learning

Statistical Learning Theory

Convex Optimisation

Computer Vision

Supervised Learning

Algorithm Design & Analysis

## SOFTWARE SKILLS

Strong Proficiency:

Python • Git • Airflow

Intermediate Proficiency:

PySpark • Kubeflow • SQL

Docker • GCP • LaTeX

Familiar:

C • PIC Assembly

## PERSONAL INFO

Canadian Citizen

Native English Proficiency

## PUBLICATIONS

Power Optimization Using Embedded Automatic Gain Control Algorithm with Photoplethysmography Signal Quality Classification (ICASSP 2020)

Robust Beat-To-Beat Detection Algorithm for Pulse Rate Variability Analysis from Wrist Photoplethysmography Signals (ICASSP 2018)

Development and Validation of a 3D-Printed Neuronavigation Headset for Therapeutic Brain Stimulation (Journal of Neural Engineering 2018)