

James Wu

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WORK EXPERIENCE

UNIVERSITY COLLEGE LONDON

London, UK

Research Assistant (MSc.)

June 2022 - Present

Generalised Variational Inference for Gaussian Processes

JAX, Flax, Optax

- Achieved linear time inference objectives for **variational Gaussian processes** compared to cubic complexity approaches in the literature
- Leveraged **generalised variational inference** (GVI) to prevent the KL divergence support mismatch of standard function space variational inference
- Developed comprehensive software implementations available on **GitHub**

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 (Junior → Mid → Senior)

Aug 2019 - Sept 2022

Global Card Issuance for Company Profitability

Pyro, PyTorch, BayesOpt, Airflow, GCP

- Optimised global card issuance for over 20M users to maximise Revolut's profitability and earn rebates of \$100M+ per year
- 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)

Customer Support Automation

PyTorch, MLflow, Elasticsearch, Scikit-Learn, Airflow

- Built semantic search and intent recognition of customer chat messages with **one-shot learning** and **transformer** sentence embeddings

User Personalisation

TensorFlow, PySpark, Dataproc, Airflow, GCP

- Personalised user experiences to improve retention
- Developed **LSTM** solution to predict user-level spending behaviours
- 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

- Demonstrated state-of-the-art performance for **named-entity recognition** (NER) of biomedical literature
- Applied **transfer learning** and **multi-task learning** to pre-trained **BERT**

ANALOG DEVICES INC.

Toronto, CA

Data Scientist (Intern)

May 2017 - Aug 2018

Power Optimisation for PPG Heart Rate Sensors

Embedded C, MATLAB

- Designed a power saving algorithm that reduced sensor power consumption by 50% while maintaining the same signal quality

EDUCATION

UNIVERSITY COLLEGE LONDON

MSc. Computational Statistics & Machine Learning

Graduated First Class Honours

UNIVERSITY OF TORONTO

BAsC. Engineering Science (Robotics Specialisation)

Graduated 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)