# 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 learning objectives for variational Gaussian processes compared to cubic complexity approaches in existing 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-tasked 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)