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 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)