

# Christopher Wang

📍 London UK    ✉ christopher.wang.24@ucl.ac.uk    ☎ +44 7918 683168    🔗 christopher-wang.github.io/

in christopher-jj-wang    🌐 christopher-wang

## Education

<b>University College London</b> <i>MSc in Computational Statistics &amp; Machine Learning</i>	<b>Sept 2024 – Ongoing</b> <i>London, United Kingdom</i>
<b>Carleton University</b> <i>BEng in Software Engineering</i>	<b>Sept 2016 – May 2021</b> <i>Ottawa, Canada</i>
<ul style="list-style-type: none"> <li>◦ <a href="#">Chancellor's Medal</a> 🏆 for outstanding academics, ranked 2<sup>nd</sup> across all departments (graduating class of 795)</li> <li>◦ 11.88/12.00 GPA, Dean's List, Distinction, Carleton Academic Scholarship (totalling \$25,000)</li> </ul>	

## Research Experience

<b>Undergraduate Student Researcher</b> (Part Time) <i>Carleton University, funded by I-CUREUS grant (\$2250)</i>	<b>Sept 2020 – Apr 2021</b> <i>Ottawa, Canada</i>
<ul style="list-style-type: none"> <li>◦ Applied unsupervised image segmentation using convolutional neural networks and random forests with hierarchical agglomerative clustering to multi-channel satellite imagery</li> </ul>	
<b>Research Science Intern</b> <i>Nuance Communications (a Microsoft Company)</i>	<b>May 2020 – Aug 2020</b> <i>Montréal, Canada</i>
<ul style="list-style-type: none"> <li>◦ Implemented homomorphically encrypted representation search using Face-Net embeddings and SEAL</li> <li>◦ Enabled an efficient homomorphically encrypted dot product by integrating the vector sum operation into Python bindings of the TenSEAL open-source library, facilitating nearest neighbor search on embedding tensors</li> <li>◦ Investigated polynomial activation functions for fully encrypted convolutional neural network inference</li> <li>◦ Performed literature review on private machine learning inference with a focus on cryptographic solutions</li> </ul>	
<b>Undergraduate Student Researcher</b> (Part Time) <i>Carleton University, funded by I-CUREUS grant (\$2250)</i>	<b>Jan 2020 – Apr 2020</b> <i>Ottawa, Canada</i>
<ul style="list-style-type: none"> <li>◦ Fine-tuned pretrained Resnet-18 models for orca whale call segmentation from spectrograms supplied by Fisheries and Oceans Canada and the INTERSPEECH 2019 ComParE Orca Activity Subchallenge</li> <li>◦ Explored gradient-boosted tree models trained on short-window audio features</li> </ul>	
<b>Undergraduate Student Researcher</b> <i>Carleton University, funded by NSERC USRA and I-CUREUS grants (\$8550 total)</i>	<b>Jan 2018 – Dec 2018</b> <i>Ottawa, Canada</i>
<ul style="list-style-type: none"> <li>◦ Researched U-Net architecture ensembles (inception modules, residual blocks, dense blocks, attention connections, etc) for left atrial MRI segmentation</li> <li>◦ Developed a framework for rapid prototype testing of image segmentation models with data augmentation (translation, rotation, gaussian blur, elastic transform) for 2D and 3D MRI images built on Keras/TensorFlow</li> </ul>	

## Patents & Publications

<a href="#">Adaptive Learning Rates for Gradient Boosting Machines</a> 📄, C. Wang, Z. Wang, Y. Ouyang, B. Haji Soleimani, CAIAC 2024	<b>May 2024</b>
<a href="#">Systems and methods for dynamic demand sensing and forecast adjustment</a> 📄, A. Khanafer, B. Haji Soleimani, S. Ouellet, C. Wang, C. Bisson-Krol, Z. Lin, US Patent	<b>Aug 2023</b>
<a href="#">Systems and methods for dynamic demand sensing</a> 📄, S. Ouellet, Z. Lin, C. Wang, C. Bisson-Krol, US Patent	<b>Nov 2022</b>
<a href="#">Reciprocal perspective as a super learner improves drug-target interaction prediction (MUSDTI)</a> 📄, K. Dick, D. G. Kyrollos, E. D. Cosoreanu, J. Dooley, J. S. Fryer, S. M. Gordon, N. Kharbanda, M. Klamrowski, P. N. L. LaCasse,	<b>Aug 2022</b>

T. F. Leung, M. A. Nasir, C. Qiu, A. S. Robinson, D. Shao, B. R. Siromahov, E. Starlight, C. Tran, **C. Wang**, Y. Yang & J. R. Green, Scientific Reports

**Systems and methods for features engineering**  S. Ouellet, Z. Lin, **C. Wang**, C. Bisson-Krol, US Patent

**July 2022**

**An ensemble of U-Net architecture variants for left atrial segmentation** , **C. Wang**, M. Rajchl, A. Chan, E. Ukwatta, SPIE Medical Imaging 2019

**Mar 2019**

## Work Experience

---

**Senior Machine Learning Engineer**  
*Kinaxis*

**Jan 2024 – Sept 2024**  
*Ottawa, Canada*

- Recognized by CEO as one of the top 10 most innovative engineers within Kinaxis (1781 employees total)
- Developed a retrieval augmented generative AI backend system on Azure and GCP using the OpenAI/Gemini API, FastAPI, Azure Cognitive Search/Vertex AI Vector Search, and MongoDB, with automatic CI/CD integration using Docker, Helm, and Github Actions, integrating multiple enterprise knowledge bases
- Led Proof of Concept (PoC) Data Science analysis on supply chain data, employing inferential statistics, machine learning, and data visualization to demonstrate product value to secure new B2B customers
- Supervised an intern project for accelerating gradient boosted tree training using self adaptive learning rates

**Machine Learning Engineer**  
*Kinaxis*

**May 2021 – Dec 2023**  
*Ottawa, Canada*

- Crafted a novel New Product Introduction (NPI) algorithm for demand forecasting using PySpark, increasing the accuracy for new product forecasts by 35% (from 0.85 WMAPE to 0.50 WMAPE)
- Engineered outlier detection and treatment based on interquartile range for demand forecasts at scale using PySpark, leading to a 3% forecast accuracy improvement with minimal increase to runtime
- Architected a data segmentation module using PySpark, and Argo Workflows, allowing for the processing of terabyte-scale data, resulting in a 8.19x end-to-end speed up (131 hours to 16 hours), 18.84x reduction in data storage (6.8 TB to 361GB), and a 10.11x reduction in yearly cloud costs (1,377,012\$ to 136,084\$)
- Led implementation of a forecast explainability feature based on SHapely Additive exPlanations (SHAP)

**Machine Learning Developer Intern**  
*Kinaxis*

**Jan 2019 – Dec 2019**  
*Ottawa, Canada*

- Prototyped various architecture designs for an automatic time series forecasting using technologies like Apache Kafka, Spark, Dask, Pandas, LightGBM, PrestoDB, Amazon S3, and Postgresql/PostGIS on Kubernetes
- Evaluated different neural networks (LSTMs, 1D convolutions), ensemble tree models, SVM regressors and feature selection techniques (genetic algorithms, mutual information, Boruta) for times series forecasting
- Introduced Dask on Kubernetes for parallelizing python jobs, resulting in linear speed ups (up to 16x)

## Projects

---

**Peptide - Receptor Binding Prediction and Generation**

**June 2024 - Ongoing**

- Applied graph neural networks with AlphaFold 2 embeddings to predict peptide binding for protein receptors
- Used Chroma & RFDiffusion to generate candidate peptides for orphan receptor bindings, testing in wet lab

**CANSSI National Case Study Competition**

**Sept 2019**

- Achieved silver for poster on real-time ferry lateness prediction with an AutoML system (Bayesian model optimization, automatic feature engineering, unsupervised feature selection), presented at Simon Fraser University

## Technologies

---

**Programming Languages:** Python, JavaScript, Java, SQL, C/C++, R

**Analytics/ML Libraries:** Pandas, Pytorch, PySpark, SciKit-Learn, LightGBM, Seaborn, Keras

**Deployment Technologies:** Docker, Kubernetes, Helm, Databricks, Argo, GitHub Actions, SLURM