Paul Kang

Toronto, Canada · pkang0831@gmail.com · 6474595390 · https://pkang0831.github.io/Personal_Website/

Education

University of Texas at Austin — Austin, TX
Masters Data Science — Sep 2022 - Dec 2024

University of Waterloo — Waterloo, ON
Bachelors Chemical Engineering — Sep 2012 - May 2018

Relevant Experience

Machine Learning Engineer @ Restaurant Brands International - Tim Hortons — Ontario, Canada
Customer Lifetime Value - Customer Segmentation and Market Research — Jan 2022 - Present

- Objective: Apply customer lifetime value for Tim Hortons on loyalty customers to improve marketing and advertisement strategies.
- Execution: Implemented statistical CLV models to account for typical Tim Hortons loyalty customers. Productionized the process and implemented CI/CD using Terraform for monthly updates. Stacks: Python, Databricks, Terraform, GitHub
- Impact: Achieved model R2 of 0.86 with $<$ 2 CAD error on 8 million monthly active users, helping Tim Hortons achieve 132% of marketing team's business goals in 2023. This work was showcased to C-suite executives and selected as a main business KPI for upper management reporting.
- Additional Work: Conducted feature importance extraction using GLM and tree-based regression algorithms to identify key metrics and product lines important to different customer segments.

Product Recommender - Business Incrementality

- Objective: Improve business sales by increasing redemption rate of weekly offer product recommendation system of Tim Horton's mobile app
- Execution: Implemented deep learning model that employs factorization machine & MLP driven algorithm. Stacks: Pyspark, PyTorch, Databricks and statistical ML models libraries.
- Impact: Replaced existing Tim Horton's offer assignment mechanism; improved total redemption rate by 1.2%, uplifting the business revenue by 76M CAD in Q1 2024.
- Additional Work: Conducted explainable AI to enhance understanding of deep learning models. Convinced business professionals on model behavior and identify improvement points for future version release

Sales forecasting - Digital Operation Optimization

- Objective: Optimize the timing of product recommendation pop-ups/push notifications to increase customer purchase likelihood and drive business sales.
- Execution: Developed a model combining meta-learning methods with a neural temporal point process algorithm to predict the next set of expected events for 7 million customers. Stacks: Python, TensorFlow, PyTorch, Databricks.
- Impact: Replaced the existing strategy with a personalized notification system, improving the net promoter score (NPS) by 25% and increasing business sales by approximately 2.5%, equating to an additional 150 million CAD in revenue.
- Additional Work: Applied explainable AI techniques to enhance the understanding of the model's behavior, convincing business professionals of its effectiveness and identifying improvement points for future versions.

Skills

Development:	Python, Javascript (React JS & AJAX), Git, Gitlab CI/CD, Docker, NGinx, k8s
Big Data & Pipelines:	Hadoop, Spark, Hive, Azure Data Factory, SAP Hana, SQL, MariaDB, Pyspark
Classic ML / Deep Learning:	XGBoost, Pandas, Numpy, Scipy, Sklean, MLFlow, Tensorflow, PyTorch
Visualization and Dashboard:	Power BI, Web application based UIs, Plotly, Matplotlib, Seaborn, Streamlit
Domain Knowledge:	Product recommender, NLP, Manufacturing ML, Cluster analysis

Projects

Canadian Permanent Residence Helper - Time Series Forecasting MLOps
https://github.com/pkang0831/CRS_main
Launched a flask-based web application to help new immigrants who are going through tedious Canadian Permanent Residency application.