

# Kelvin Ng Ka Lok

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 ngkel.github.io  ngkel

## General Information

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**Date of Birth:** 7th May 1997

## Academic Interests

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### Representation Learning

- Interpretable representation learning methods for building so-called world model, or system identification if you prefer that term
- Continual learning of representation for building world model
- Computer vision based representation learning

### Reinforcement Learning/Control Theory

- Optimal control with learned world model
- How optimal control task may impact representation learning

## Education

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### BSc in Mechanical Engineering - The University of Hong Kong

Jan 2019

- 1st Class Honours.
- Microsoft Innotech Law Hackathon 2018, First Runner-up.
- Fuzzy system and neural network (A-)

### Data Science Summer Camp - Theory, Algorithms and Applications - Institute of Data Science, The University of Hong Kong

Jan 2023

- Machine learning performance evaluation, Bayesian classifier, linear programming, non-linear programming, network theory

### Reinforcement Learning Specialization - Online Course - University of Alberta

Jan 2022

- Understand the space of RL algorithms (TD learning, Monte Carlo, Sarsa, Q-Learning, Policy Gradient, Dyna and more)
- Implement RL algorithms (TD, Expected Sarsa, Q-Learning, Dyna, Actor-Critic) on toy datasets, in both discrete and continuous state environments

### Natural Language Processing with Sequence Models - Online Course - DeepLearning.AI

Jan 2022

- Learn about neural networks for sequential data modeling (RNN, LSTM, GRUs)
- Implement sequential model on different tasks (Named Entity Recognition, Next-Word Generator, Sentiment Analysis)

## Experience

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### Foodpanda Hong Kong, Performance Manager - Commercial Team

2021 - Present

- Implement LLM algorithm for competitor and product level analysis. Tools: OpenAI API
- Develop dashboards, visualizations and regular reports to facilitate efficient data analysis on the topics of market competition, profit and loss, vendors acquisition and churn. Tools: Tableau, Looker Studio, BigQuery
- Manage ETL process for data warehouse. Tools: DBT, Airflow
- Build vendor grading machine learning model to predict vendor performance and churn risk. Tools: Python, Pandas, NumPy, Scikit-learn, SciPy, Matplotlib, Seaborn, Plotly, Dash, Streamlit

- Build machine learning model for customer churn prediction of LTS service and automate feature engineering and model training pipeline
- Create and schedule pipelines of web-crawling to extract data from external websites for sales strategies enhancement, competitor alert and machine learning model feature enrichment
- Conduct customer segmentation for Club Shopping from cross business unit data to understand customer interests and preferences for target marketing

## Projects

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### Whitebox Transformer Implementation

- Implement CRATE architecture for image classification task on Fashion-MNIST dataset.
- Visualize the low-rankness of the representation, autocorrelation of subspace learnt in each layer of MSSA.
- Visualize the semantic meaning of each attention head.

### Resemblance of Cross Attention like Operator with Conditional GMM Denoiser

- Train conditional GMM denoise.
- Visualize the conditional sampling results and interpret the results.
- Illustrate the resemblance of cross attention like operator with conditional GMM denoiser.

### Mini World Model with CRATE

- Implement LeWM from scratch.
- Replace ViT with CRATE.
- Explore, with CRATE replacing ViT, whether attention patterns can enable unsupervised video segmentation.
- Familiarize myself with Hydra and wandb for efficient experiment tracking.

## Languages

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**Languages:** English, Cantonese, Mandarin