Karolis Jankauskas

A Biochemical Engineer turned Data and Machine Learning Engineer.

Languages Python • Cython • C++ • R • Julia • CUDA
Libraries Keras • TensorFlow • Xgboost • Sklearn • SciPy ecosystem • rpy2 • OpenCV
Backend Flask • Django • Celery
Databases PostgreSQL • RabbitMQ • Redis
Tools Git • CircleCI • Docker • AWS
Other Deep Learning • CNN • LSTM • Sequence Models • Time Series
PhD research Scheduling • Evolutionary Programming • Mathematical Programming

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EXPERIENCE

Data Engineer (internship)
WorldQuant
London, UK, 2018 September – Present

WorldQuant is a quantitative asset management firm with more than 700 employees across 26 offices in 15 countries.

- Developed an encoder-decoder LSTM-based system for anomaly detection in time series data.

Machine Learning Engineer (worked part-time whilst doing a PhD)
Aiden.ai
London, UK, 2018 February – 2018 September

Aiden is a Natural Language Processing (NLP) powered virtual assistant who helps marketers make better decisions.

- Developed and deployed a REST API to detect anomalies in advertising time-series data in real-time.
- Built a multi-task deep neural network-based model with entity embeddings of categorical variables to answer questions such as "*What will the total number of impressions, link clicks, and app installs be next week if I spend $X on ads ABC targeting Y audience in Z location?*".
- Created a neural network and genetic algorithm-based system for recommending an optimal way to distribute weekly advertising budget to maximise ad sets performance, e.g. impressions, link clicks, and app installs.

Data Scientist (worked part-time whilst doing a PhD)
Picasso Labs
London, UK, 2017 Feb – 2018 February

Picasso Labs is recognised as one of Unilever Foundry's most ambitious and innovative start-ups of the past 5 years.

- Using a pre-trained Inception v3 CNN, HSV color histograms, and entity embeddings of date, time, and image tags developed a system for recommending images to improve marketing performance on social media.
- Re-used the system above to create a content-based image retrieval engine.
- Built a custom facial expressions recognition model and applied it on over 5000 web-scraped images from US online media to investigate "visual bias". See www.newsweek.com/liberal-media-not-biased-trump-thinks-703291
- Applied regression and non-parametric statistical tests to determine best performing image categories and segments.

Teaching Assistant
UCL Biochemical Engineering
London, UK, 2016 February – 2018 February

Supervised research and taught MSc and MEng students discrete-event simulation, mathematical programming, evolutionary programming, and multi-objective optimisation.

Consultant (internship)
Sphere Fluidics Ltd
Cambridge, UK, 2014 June – 2014 August

Created fluid-flow models of microfluidic chips for a novel single-cell screening and analysis system.

Research Associate
UCL Advanced Centre for Biochemical Engineering
London, UK, 2013 June – 2013 August

Performed multi-variate data analysis on mass spectrometry data to improve the expression of virus-like particles from *Pichia pastoris* cells for a universal influenza vaccine project.

EDUCATION

Udacity
2017 – 2018
Nanodegree, Artificial Intelligence, Certificate of Completion

- Implemented Depth-First Search, Constraint-Propagation, Minimax, Alpha-Beta Search, and Iterative Deepening algorithms to solve Sudoku and beat human players in the game of Isolation.
- Using Planning Domain Definition Language (PDDL), A*, and propositional logic developed a solution to find the most efficient route to route air cargo to their respective destinations.
- Using a preprocessed dataset of tracked hand and nose positions extracted from video, trained a set of Hidden Markov Models (HMM) to identify individual sign language words.
- Implemented and applied feed-forward NN, CNN, and RNN on a variety of problems such as classification of over 100 different dog breeds, facial keypoints detection, time-series prediction, and language models.

UCL
London, UK, 2014 – 2018 (thesis submitted in 2018 September, awaiting Viva)
PhD, Biochemical Engineering (Operational Research, Combinatorial Optimisation)

Thesis title: "Biopharmaceutical Capacity Planning using a Flexible Genetic Algorithm Approach"

Using Python, C++, CUDA, and Docker, developed a cross-platform genetic algorithm-based tool for continuous-time multi-objective planning and scheduling of biopharmaceutical facilities under deterministic and stochastic demand.

| *Accomplishments* | - Presented a keynote lecture at the 27th European Symposium on Computer Aided Process Engineering (ESCAPE 27), Barcelona, Spain, 2017. |
| | - Awarded a Year 1 Research Project Prize for Best PhD Project and Poster. |

UCL
London, UK, 2010 – 2014
Master of Engineering (MEng), Biochemical Engineering, First-Class Honors

| *Accomplishments* | - Received Jacobs Engineering Design Project Prize. |
| | - Received Head of Department Commendation Award. |

| *Activities* | - Fitness instructor at UCLU Muay Thai Club. |

PUBLICATIONS & TALKS

Jankauskas K, Papageorgiou, L.G. and Farid, S.S., Fast Genetic Algorithm Approaches to Solving Discrete-Time Mixed Integer Linear Programming Problems of Capacity Planning and Scheduling of Biopharmaceutical Manufacture, Computers and Chemical Engineering (2018), DOI: https://doi.org/10.1016/j.compchemeng.2018.09.019

Jankauskas, K., Papageorgiou, L.G. and Farid, S.S., 2017. Continuous-Time Heuristic Model for Medium-Term Capacity Planning of a Multi-Suite, Multi-Product Biopharmaceutical Facility. In *Computer Aided Chemical Engineering* (Vol. 40, pp. 1303-1308). Elsevier, DOI: https://doi.org/10.1016/B978-0-444-63965-3.50219-1

Jankauskas, K., McCartney, GR., Osborne, MD., Papageorgiou, LG., Farid, SS. 2017. Multi-Objective Capacity Planning for Multi-Product Biopharmaceutical Facilities Under Uncertainty, 253rd ACS National Meeting, San Francisco, USA, April 2-6.

Jankauskas, K., Papageorgiou, LG., Farid, SS. 2016. Production Scheduling of a Multi-Product Biopharmaceutical Facility Using a Genetic Algorithm, 28th European Conference on Operational Research (EURO), Poznan, Poland, July 4-8.

PROJECTS

- www.github.com/karolisjan/BiopharmaScheduling/tree/development a scheduling library for biopharma
- www.github.com/karolisjan/DeepLearning a collection of deep learning projects
- www.github.com/karolisjan/Genetic-Programming AI controllers created using genetic programming