Victor Khamesi

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Education

Master of Science in Statistics, Imperial College London *Oct. 2021 – Oct. 2022*

- Overall mark: High Distinction (82/100).
- Master's Thesis: *Changepoint Detection in Streaming Data using Neural Networks*, advised by Doctor Dean Bodenham in the Statistics section within the Mathematics Department (84/100).
- Relevant courses: Computational Statistics (91/100), Applied Statistics (80/100), Machine Learning (94/100), Deep Learning (91/100), Data Science (89/100), Fundamentals of Statistical Inference (78/100) and related courseworks.

Master of Science in General Engineering, École Centrale de Lyon *Sep. 2019 – Oct. 2022*

- French *Grandes Écoles d'Ingénieur – Diplôme d'Ingénieur Généraliste.*
- Relevant courses: Linear Algebra, Analysis, Optimisation, Statistics, Probability, Machine Learning, Deep Learning, Computer Science, Quantum Physics, Chemistry, Signal Processing, Electrical Engineering.
- Academic excellence award for a research project conducted during first year and academic publication.

Classes Préparatoires aux Grandes Écoles, Lycée Janson de Sailly *Sep. 2017 – Aug. 2019*

- French *Preparatory Classes to Engineering "Grandes Écoles"* CPGE MPSI-MP.
- Two years intensive courses in Mathematics, Physics and Computer Science.
- Research project: chaos theory in mathematics and physics, with applications to logistic map and forced oscillations pendulum.

Experience

Data Scientist, Amazon Science & Amazon Development Centre *Nov. 2022 – Present*

- Context: science for advertising and contextual targeting; research in experimental design and A/B testing; developing machine learning models and deep learning architectures.
- Responsibilities: designing offline code and experiments for new statistics and insights; developing statistical algorithms, machine learning and deep learning models to improve targeting quality; investigating feasibility of scientific concepts to business problems; scientific research projects.
- Main projects:
  - Improving and extending targeting machine learning models to wider audiences, features importance and explainability analysis (boosted trees, transformers, Bayesian optimisation using Gaussian processes, Shapley values).
  - Representation learning for geo-location at different granularity levels based on open-source data (kernel principal components analysis, stochastic neighbour embedding, auto-encoders).
  - Designing a novel approach, new metrics and statistics for measuring targeting utility based on simulations, sampling and density estimation (probability, statistics, hierarchical modelling).
  - Research in experimentation and A/B testing, extending to multivariate context and increasing explainability (two-sample hypothesis testing, classifiers, probability).
- Research and knowledge sharing through internal conferences and papers.

Data Scientist Intern, Mon Petit Placement *May. 2021 – Sep. 2021*

- Context: mining insights using machine learning, statistics and software engineering for understanding user behaviour and improving the company services and customer experience.

- Responsibilities: data extracts from different sources (SQL, web scraping) to provide insights and produce analyses; customer segmentation using clustering techniques; end-to-end development of machine learning algorithms.
- Main projects:
  - Development of end-to-end machine learning algorithms for modelling prospect conversion probability and their risk profile, scalable and updated daily and real time inference (ensemble learning, `API`).
  - Natural language processing for understanding customer needs based on chat data and grouping them by similarity (transformers, clustering, visualisations).
  - Implementation of an automated bank details recognition script for improving customer experience, suitable both for images and PDF (character recognition, software engineering, `API`).

Publications

Khamesi, Victor (2022) *Changepoint Detection in Streaming Data using Neural Networks, with Applications to Financial Data and Computer Vision*, Master's Thesis, Imperial College London

- Designing a novel non-parametric deep learning based approach for online changepoint detection in both univariate and multivariate time series (Research Poster).
- Sequentially learning convolutional neural network, which does not require pre-training or fine tuning, used to output a dissimilarity measure based on Kullback-Leibler divergence.
- Statistical performance comparisons show that proposed method performs as well as reviewed state-of-the-art algorithms in different types of changes (location, scale) but also extend to multivariate data.

Khamesi, Victor (2022), `ocpdet`: A Python package for online changepoint detection in univariate and multivariate data. Zenodo. `https://doi.org/10.5281/zenodo.7632721`

Khamesi, Victor et al. (2020) *Quantitative Management of Fund of Funds using Machine Learning*, Academic Publication, École Centrale de Lyon

- Development of statistical machine learning algorithms from scratch for solving a selection and ranking problem of funds to be included in a portfolio.
- Automated pipelines for creating up-to-date databases, Kohonen networks, portfolio optimisation using hierarchical clustering and graph theory.
- Ranked first at *Finance & Innovation for Good* national competition by Google Cloud, HSBC and others (project named FundBuilders).

Other Contributions

Amazon Internal Conferences:

- Talk on *Experimentation from a Statistics Perspective*.
- Peer Reviewer for Amazon Machine Learning Conference 2023.

Khamesi, Victor (2022) *Exploring the Likelihood of Disinformation Propagation on Social Media: A Statistical Analysis of Critical Predictors*, Academic Publication (20/20), Imperial College London

Skills

Science	`Python (TensorFlow, Keras, statsmodels, scikit-learn), R (dplyr, caret, ggplot2)`
Data	`SQL, NoSQL (basic), PySpark, AWS (S3, Athena, SageMaker)`
Others	`git, bash, C++ (basic), LaTex`

Interests

Sports	Rugby (CS Bourgoin-Jallieu, ASVEL, Centrale Lyon), Ski Club Les Menuires, Snowboard.
Aviation	Obtained Private Pilot Licence PPL-A at 18 years old (based in Lyon-Bron, France).
HandiManager	Training and examination on the integration and well-being of people with disabilities at work.