Andrea Karlová

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University College London, London, United Kingdom
Department of Computer Science, 2015 - present
Research Student

- robustness of latent representations
  used methods: Optimal Transport Theory, VAEs, GECO for fine-tuning beta-VAEs
- since *July 2020* I have been working on material science discovery project in collaboration with University of Surrey (Prof. Ravi Silva) and UCL AI Centre (Prof. Brooks Paige)
  used methods: evaluation of the atomic structures using Density Functional Theory (GPAW and ASE packages, RDKit), Graph Neural Networks with Message Passing (PhysNet, DimNet, OrbNet), FermiNet, Grammar VAE, material science pre-trained word embeddings

Education

Pursuing PhD in Computer Science, University College London, United Kingdom — present
Pursued PhD in Mathematics, Charles University, Prague, Czech Republic — 2014
(PhD *title not gained* in 2013 due to death of supervisor)
Mgr. (BS + MSc) in Mathematics, Charles University, Prague, Czech Republic — 2005

Employment

Tech & Startups: 2017 - present
Fractal Labs Ltd., July 2018 – August 2020
Senior Data Scientist, Data Science Lead

- Time-series forecasting for Small and Medium Enterprises cash flow
  used methods: VAEs applied to time series, time warping loss function, Neural ODEs, various CNNs and RNNs based architectures, Random Forests, Kalman Filters
- Domain Specific Conversational chatbot for Small and Medium Enterprises
  used methods: various CNNs and RNNs based architectures for Language Understanding Unit (NER model, Intent Classifier), Q-learning with memory reply (Dialog Manager component), VAEs (Language Generation)
- full production pipeline for ML models: Tensorflow Extended, docker
- worked on R&D grant applications: awarded 300k GBP InnovateUK grant (Project Lead)
- active collaboration with University of Bristol and UCL CS on MSc. student projects supervision
  MSc thesis co-supervised:
  Stein, Adam, *Neural Variational Inference for Text Generation*, May 2019
  Pabrinkis, Aurimas, *Measuring the Spatial Distortions Caused by Embeddings*, September 2019

StatusToday, November 2017 – April 2018
Data Science and R&D

- created and developed employee productivity analytics based on user file activity recognition
  used methods: randomised intensities of Compound Poisson processes and change points detection

Academic and Research Positions: 2010 - 2016
University College London, London, United Kingdom

Department of Computer Science, 2015
Visiting Research Student

- preliminary research into constructing financial instruments based on intellectual property and related trading platform
  used methods: hidden Markov models, market making strategies using RL
- calibration of tempered Levy Flights volatility surfaces to the FX market data
- supervision of MSc student final theses:
  Munir, Necati, *Creating a Trading Platform for Intellectual Property Trading*, April 2016.
  Zhao, Yaolin, *Trading Simulation in the Intellectual Property Market*, September 2015.

University College London, London, United Kingdom
Department of Civil, Environmental & Geomatic Engineering, 2015
Developer

- testing scalability of a high-volume Fusion and Analysis platform for geospatial clouds which was co-funded by European Commission (FP7 2002 – 2013, IQmulus project)

Gorilla Science, 2011 - 2016
PhD and research funding

- long running collaboration with Dr. Patrick S. Hagan on the term structure volatility surface models using tempered Levy Flights in order to produce robust hedges for forward starting products
  results first presented at: RISK Event Quant Summit 2016 Europe, April 2016
  used methods: partial integral differential equations, stochastic calculus for pure jump processes, perturbation theory, complex variables

Imperial College London, Department of Mathematics, 2015-2016
Visiting Research Student

- fixed income models driven by tempered Levy Flights

University of Oxford, The Oxford-Man Institute of Quantitative Finance, 2010
Visiting Research Student

- computational methods for option pricing models driven by stable laws
  results presented at: QMF Quantitative Methods in Finance, Sydney, 2010

Columbia University, Department of Statistics, 2010
Visiting Research Student

- developing numerical solutions for option pricing models driven by stable laws
  results presented at: seminar talk at Rutgers University

Financial Industry: 2005 - 2010
PricewaterhouseCoopers Czech Republic, 2009 - 2011
Consultant

- pricing exotic financial derivatives and illiquid products

KBC Global Services, Group Value and Risk Management, 2006 – 2008
Model Validation, Associate

- validation of Interest Rate Derivatives and Life Insurance Derivatives models

CSOB (member of KBC Group), Risk Management Department, 2005 - 2009
Market Risk, Associate

- market risk methodology, independent price verification, reporting to the Board of Executives
- quantitative researcher for commodity trading models

Selected Publications

1. (2020) Karlová A.; *Robustness of Latent Representations*, July 2020, Conference Workshop Proceedings UDL ICML 2020
2. (2018) Klebanov L., Karlová A.; *Distributional Tail Estimation through its Characteristic Function*, Mar 2018, Journal of Mathematical Sciences, Vol. 229, Issue 6, pp 714–718
3. (2016) Karlová A., Hagan P.S.; *On Beyond Black*; Sept. 2016, Wilmott, p.42-69
4. (2013) Karlová A.; *On distribution of product of stable laws*; SIAM Theory of Probability and its Applications (submitted September 2013, accepted July 2015)
5. (2008) A. Karlová; *Levy Processes and Balayage Spaces*; J. Antoch., G. Dohnal, (Eds.) ROBUST 2008, Proceedings of the 13th Summer School of the Union of Czech Mathematicians and Physicists, 171—176.

Selected Talks

1.	QuantInsights, London	2019
2.	Women in Data Science, 2019, Tel Aviv,	2019
3.	49th London PyData Meetup	2018
4.	RISK Event Quant Summit 2016 Europe	2016
5.	Quantitative Methods in Finance, QMF 2010, Sydney, Australia	2010
		2009

Programming Skills and Languages:

- programming languages: Python, C/C++, Bash
- libraries: Python – Tensorflow, SciPy, Numpy, Pandas, ScikitLearn, PyMC3
- other tools: SQL, MongoDB, git, docker, AWS
- operating system: Linux (Debian)

Grants, Honours, Awards:

InnovateUK (2019), Bio-Math Summer School and Workshop. Middelfart, Denmark (2008), 'Stochastic Differential Equation Models with Applications to the Insulin-Glucose System and Neuronal Modelling' at Satellite Summer School on Levy Processes, funded under Marie Curie EU grant contract. Sandbjerg, Denmark (2007), 'Statistics for stochastic differential equations models' at EMS Summer School, Séminaire Européen de Statistique, funded under Marie Curie EU grant contract. Cartagena, Spain (2007), Global Association of Risk Professionals Seminar under scholarship from Agence de Transfert de Technologie Financiere. Luxembourg (2005)