ZSOMBOR KOMAN

linkedin.com/in/zsombor-koman

EDUCATION

Central European University, Budapest, Hungary — 2018

MS Mathematics and Its Applications, specialization in Network and Data Science (with Distinction, GPA 3.92/4)

- *Excellence Scholarship*
- Thesis: Success Dynamics in an Online Photo Sharing Platform; Advisors: Roberta Sinatra, Rossano Schifanella
- Selected coursework:
  - Data Mining and Big Data Analytics
  - Intermediate Stochastic Analysis
  - Monte Carlo Methods in Scientific Computing
  - Theory of Algorithms

Eötvös Loránd University, Budapest, Hungary — 2016

BS Physics, specialization in Computer Science (GPA 4.99/5)

- *Excellence Scholarship*
- Thesis: Optimization of Collective Decision Making; Advisors: Tamás Vicsek, Anna Zafeiris
- Selected coursework:
  - Statistical Learning in Neural Systems
  - Evolutionary Game Theory
  - Statistical Physics
  - Computer Simulations

RESEARCH AND TEACHING EXPERIENCE

Central European University, Budapest, Hungary — 2018

Teaching Assistant (Professor: Eszter Somos; Analyzing Data with Python course)

- Guided knowledge acquisition through discussions and interactive problem solving
- Assessed student assignments and formulated a model-based scoring system for calculating the final grades

QuantSuccess project – Central European University, Budapest, Hungary — 2017-18

Lab Member (PI: Roberta Sinatra)

- Examined the quantitative aspects of success in user data of online photo sharing platforms
- Investigated the causal relationships between aesthetic scores derived through deep learning and popularity metrics
- Showcased findings in the scope of a master's thesis

Central European University, Budapest, Hungary — 2017

Teaching Assistant (Coordinator: Károly Böröczki; Just Data course)

- Facilitated discussions about the technical aspects of topics related to data privacy and security

Microdata lab – Central European University, Budapest, Hungary — 2017

Research Assistant (PI: Miklós Koren, Ádám Szeidl)

- Upgraded, enhanced, and documented a deprecated entity resolution system (Python)

Open Learning Initiative Program (OLIve), Budapest, Hungary — 2017

Mathematics Tutor

- Taught high school and undergraduate mathematics in an intuitive and applicable manner to an immigrant student

Intellisense LabCamera, Budapest, Hungary — 2016-17

Educational Material Creator

- Designed insightful physics experiments suitable for an educational lab software taking measurements through webcam

Hungarian Templeton Program, Budapest, Hungary — 2016

Junior Templeton Mentor

- Mentored a secondary school student through friendly discussions and physical activities like hiking and swimming
- Stimulated his passion for scientific discovery

Computational Systems Neuroscience Lab, Budapest, Hungary 2015-16

Lab Member (PI: Gergő Orbán)

- Audited seminars on cognition and learning
- Investigated neural population dynamics through stochastic simulations
- Publicized findings at the poster session of the IBRO Conference
- Co-authored a paper based on these results in the Journal of Neurophysiology

Private STEM Tutor, Budapest, Hungary 2015-18

- Enhanced STEM knowledge and skills of secondary school, high school, and university students

Statistical and Biological Physics Research Group, Budapest, Hungary 2014-16

Lab Member (PI: Tamás Vicsek)

- Contributed to seminars on network science, flight planning for drones, and complex systems
- Researched optimal skill distributions of collaborating team members through evolutionary algorithms
- Presented findings at the Scientific Students Conference
- Resulting paper published in Physica A: Statistical Mechanics and its Applications

PEER-REVIEWED PUBLICATIONS

Bányai, M., Koman, Z., & Orbán, G. (2017). Population activity statistics dissect subthreshold and spiking variability in V1. Journal of Neurophysiology, 118(1), 29-46.

Zafeiris, A., Koman, Z., Mones, E., & Vicsek, T. (2017). Phenomenological theory of collective decision-making. Physica A: Statistical Mechanics and its Applications, 479, 287-298.

OTHER SCIENTIFIC PUBLICATIONS

Koman, Z. (2018). Connecting the dots of network science. WorldQuant Thought Leadership. (https://www.weareworldquant.com/en/thought-leadership/connecting-the-dots-of-network-science/)

Janosov, M. & Koman, Z. (2017). How to find key opinion leaders: The #istandwihtCEU Campaign. (https://networkdatascience.ceu.edu/article/2017-06-19/how-find-key-opinion-leaders-istandwithceu-campaign)

Koman, Z. (2017). Modeling and abstraction. Ingenia Hungarica III., 35-49.

Koman, Z. (2016). Interdisciplinary interactions. Ingenia Hungarica II., 19-35.

CONFERENCES

WorldQuant Research Conference, Seoul, South Korea 2019

Presentation title: Adaptive quantitative strategies in equity research

WorldQuant Technology Conference, Prague, Czech Republic 2019

Presentation title: Artificial intelligence for economic theory exploration

Templeton Talks, Budapest 2016

Presentation title: Modelling and abstraction – The connection between mathematics and the world

IBRO Workshop, Budapest 2016

Poster title: Disentangling the stochastic processes underlying neuronal variability and covariability in the visual cortex

Eötvös Conference, Budapest 2015

Presentation title: Interdisciplinary interactions

- Best presentation award in the Computer Science section

Scientific Students Conference, Budapest 2015

Presentation title: Optimization of Collective Decision Making

- Third Prize in the Statistical Physics Section

AWARDS AND HONORS

WorldQuant: CEO's Circle Award 2020
for innovative work enabling the production of scalable cross-validated online learning trading signals and successfully applying deep learning to improve economic formula discovery

Central European University: Outstanding Academic Achievement Award 2018
for first-rate academic results throughout the master's program

WorldQuant: Top Quality Researcher 2018
for exceptional research quality (out of sample model performance and uniqueness)

WorldQuant: Top Rookie Researcher 2017
for outstanding performance among junior researchers based on promising results and management assessment

Junior Templeton Fellowship 2015-17
exceptional cognitive talent grant from John Templeton Foundation (selected from 20,000 participants)

Eötvös Collegium Fellowship 2013-16
support for distinguished students – member of the Mathematics, Physics, Computer Science Workshops

SKILLS

- Programming: Python, C++, JavaScript, Scala, etc.
- AI, Optimization, Machine learning, Bayesian inference
- Substantial quantitative research experience
- Presentation, teaching, leadership skills
- Active learning, complex problem solving
- English, Hungarian, Romanian, German

ADDITIONAL TRAINING

Imperial College London, Coursera 2020
Mathematics for Machine Learning Specialization
- Courses: Linear Algebra; Multivariate Calculus; PCA

Yale University, Coursera 2020
Financial Markets (with Honors)

deeplearning.ai, Coursera 2019
Deep Learning Specialization
- Courses: Neural Networks and Deep Learning; Structuring Machine Learning Projects, Improving Deep Neural Networks: Hyperparameter tuning, Regularization and Optimization; Convolutional Neural Networks, Sequence Models

Massachusetts Institute of Technology, MIT xPRO 2019
Data Science and Big Data Analytics: Making Data-Driven Decisions

WORK EXPERIENCE

WorldQuant LLC, New York, NY 2020
Vice President, Research
- Earned a research grant for innovation and diversification research unifying scalable cross-validated online learning (SCVOL) and AI for economic formula discovery (AIED)
- Successfully led a cross-functional project team through the pandemic by applying collaborative leadership
- Reached all milestones and launched a product capable of exploring and selecting the most promising concept combinations

WorldQuant LLC, New York, NY 2019
Senior Scientist, Machine Learning

- Built models to facilitate data management decisions (acquisition, usage, and retirement) in a cross-departmental collaboration
- Oversaw two distinguished innovative projects: SCVOL and AIED
- Doubled the scale of SCVOL both in terms of participants and research output in 3 months

WorldQuant LLC, Budapest, Hungary 2019
Senior Quantitative Researcher

- Accelerated AIED and demonstrated its effectiveness in producing high-quality trading signals. Promoted the concept at the company-wide technology conference in Prague
- Strengthened and scaled SCVOL. Popularized the technology during a corporate trip to Beijing
- Established a query system to facilitate the filtering and sub-sampling of machine-generated trading signals

WorldQuant LLC, Budapest, Hungary 2017-19
Quantitative Researcher

- Generalized and boosted the research process started during the internship using machine learning and pattern matching
- Pioneered exploratory research into forecasting of trading signal performance and engineered an online learning framework in Python to validate machine learning models
- Developed a proprietary neural network library with automatic gradients from scratch in C++ for evaluating and training dynamic neural structures while minimizing memory allocation calls (100x speed-up compared to implementation based on torch)
- Devised a proprietary deep learning network architecture to predict backtesting statistics from expression trees

WorldQuant LLC, Budapest, Hungary 2017
Quantitative Research Intern

- Explored basic equity market trading signal categories (price reversion, momentum, fundamental, analyst, news sentiment)
- Created unique supply chain alphas by applying network science concepts like PageRank, betweenness centrality, network-based interpolation, and clustering by label propagation
- Earned exceptional creativity and research quality scores from advisors and research directors

Ericsson LLC, Budapest, Hungary 2016-17
Software Engineer

- Diagnosed and resolved bugs related to IP operating systems of routers in C
- Spearheaded and executed the implementation of a unit testing system in Python to automatically flag issues

NNG LLC, Budapest, Hungary 2015
Software Developer Intern

- Fixed bugs in navigation algorithms in C++
- Learned to program in Lua in a couple of days to solve bugs and implement features in the text to speech engine

OTHER EXPERIENCE

Poet since 2005
- Authored poems for prestigious Hungarian literature magazines: Kalligram, Tiszatáj, Bárka, Tempevölgy, Prae, and Helikon

Mathematics problem proposer since 2014
- Contributed tens of complex mathematical problems to the Hungarian Mathematics Contest of Transylvania

Osonó Theatre, Sfântu Gheorghe, Romania 2012
Actor, English teacher, organizer

- Played in the piece "As water reflects the face" during a 30-day European, a 20-day Thai and several regional tours
- Taught English to Thai volunteers
- Organized theatre workshops and performances