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Oto Mráz

Education

2024–2028 **PhD in Computer Science, TU Delft**, *Delft, Netherlands*.
Research Area: Scalable Cloud Applications (Supervisor: Prof. Asterios Katsifodimos)

2020–2023 **MSc in Data Science, ETH Zürich**, *Zürich, Switzerland*.
Thesis Title: Efficient ML Input Pipelines via Operator Reordering (Supervisor: Prof. Ana Klimovic), defended in February 2023 with grade 6

2017–2020 **BSc in Computer Science, King's College London**, *London, United Kingdom*.
Thesis Title: Local Search for AI Planning (Supervisor: Dr. Andrew Coles), defended with a First Class Final grade: First Class Honours

Research Interests

Data-Intensive Systems, Cloud Computing, Systems for ML, Data Science

Programming Skills

Programming Languages: Python, C++, R, Java, Scala, SQL
Machine Learning Libraries: TensorFlow, PyTorch, SNA (Social Network Analysis package in R)
Cloud Technologies: Google Cloud, Kubernetes, Kafka (Confluent Certified Developer for Apache Kafka), Azure (Microsoft Certified: Azure Fundamentals)

Work Experience

Sep 2023 –Aug 2024 **IT Consultant**, *Innovation Process Technology AG*, Zürich.
Tasks: Development and maintenance of an Apache Kafka cluster for the LGT bank.

Feb–May 2023 **Research Assistant**, *ETH Zürich*, Group of Prof. Ana Klimovic.
Tasks: Efficient ML Input Pipelines via Operator Reordering and Computation Placement. This was a continuation of my MSc thesis work with the aim to publish it at a relevant conference. The code can be accessed at: `https://github.com/eth-easl/cachew/tree/oto-pecan`

May–Jul 2022 **Research Assistant**, *ETH Zürich*, Group of Prof. Benjamin David Stocker.
Tasks: Drought Impact Forecasting Using Deep Learning Techniques. Coding, experiment design and execution, paper writing.
The code can be accessed at: `https://github.com/rudolfwilliam/satellite_image_forecasting` The work led to a publication in the Ecological Informatics journal (see Publications below).

Feb–Jun 2022 **Teaching Assistant**, *ETH Zürich*.
Course: Cloud Computing Architecture (taught by: Prof. Gustavo Alonso, Prof. Ana Klimovic)
Tasks: Designing and leading exercise sessions, designing and grading the course project, designing of exam questions

Jun–Aug 2020 Jul–Sep 2019 **Software Engineering Internship**, *MEDIAN, s.r.o.*, Prague, Czech Republic.
Tasks: Working with large-scale databases for big poll data. Developing an application for merging data collected from different surveys that include hundreds of thousands of entries (customers included advertising agencies, media corporations, and credit card issuing companies, e.g., VISA). Programmed in SQL, C++, Python and R

Sep–Dec 2019 **Teaching Assistant**, *King's College London*.
Course: Practical Experiences of Programming (the objective of the course was to teach students C++ and Scala; taught by: Dr. Andrew Coles and Dr. Christian Urban)
Tasks: Leading exercise sessions, guiding students with their coursework assignments

Recently Accomplished Projects

Master Thesis, 2023 Designing and implementing a **Policy for Operator Reordering in ML input pipelines**. Code and documentation accessible at: `https://github.com/eth-easl/cachew/tree/oto-pecan`

Interactive ML, 2022 Designing an **Interactive Data Visualization Tool** in the Domain of Real Estate. Tool accessible at: `http://realestateguru.course-xai-iml23.isginf.ch/`

Applied Net. Science, 2022 **Predicting the Outcome of Basketball Matchups** using data science techniques. Code and documentation accessible at: `https://github.com/omrazCZ/ANS`

Data Science Lab, 2021 **Drought Impact Forecasting**. Predicting the impacts of droughts on vegetation. Code and documentation accessible at: `http://github.com/rudolfwilliam/satellite_image_forecasting`

Social Data Science, 2021 **UK Newspaper Clustering**. Clustering of UK newspapers based on social media networks scraped from Twitter and newspaper characteristics. Code and documentation accessible at: `https://github.com/TGazel/SDS-project`

Publications

- Dan Graur*, **Oto Mráz***, Muyu Li, Sepehr Pourghannad, Chandramohan A. Thekkath, and Ana Klimovic. Pecan: Cost-Efficient ML Data Preprocessing with Automatic Transformation Ordering and Hybrid Placement. USENIX ATC, 2024, USENIX Association, pp. 649-665 URL: `https://www.usenix.org/system/files/atc24-graur.pdf`
- Klaus-Rudolf William Kladny, Marco Milanta, **Oto Mráz**, Koen Hufkens, and Benjamin David Stocker. Enhanced prediction of vegetation responses to extreme drought using deep learning and Earth observation data. Ecological Informatics, 2024, Elsevier, 10 p. DOI: 10.1016/j.ecoinf.2024.102474
- Hongruyu Chen, Fernando Gonzalez, **Oto Mráz**, Sophia Kuhn, Cristina Guzman, and Mennatallah El-Assady. Explore, Compare, and Predict Investment Opportunities through What-If Analysis: US Housing Market Investigation. Proc. of: 15th International Symposium on Visual Information Communication and Interaction 2023, ACM, September 22–24, 2023, Guangzhou, China, 5 p, URL: `https://www.vinci-symp.org/vinci_paper/vinci2023-t20.pdf`.
- **Oto Mráz**. Local Search for AI Planning. Joint Proceedings of the 8th Italian Workshop on Planning and Scheduling and the 27th International Workshop on Experimental Evaluation of Algorithms for Solving Problems with Combinatorial Explosion co-located with AIxIA 2020 Italian Workshop on Planning and Scheduling-Knowledge Representation and Automated Reasoning. 2020, 11 p., URL: `http://ceur-ws.org/Vol-2745/paper1.pdf`.
- Ildefonso Padrón Peña, **Oto Mráz**. Self-Organizing Neural Networks for the Analysis of Country Development, in: J. Zendulka et al. (eds.): Proc. of Data and Knowledge 2018 (Data a znalosti & WIKT 2018), Brno, October 11–12 2018, VUT Brno, Czech Republic, pp. 249–254. ISBN: 978-80-214-5679-2. pp. 249–254, URL: `http://daz2018.fit.vutbr.cz/DaZ_WIKT_2018_Sbornik.pdf`

Languages

English Fluent, 19 years of education in English

German Fluent, Goethe Zertifikat for level C2, August 2018

Czech Fluent, Mother tongue

French Basic knowledge, level A2, July 2023