

Ali Rostami

CONTACT INFORMATION

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BACKGROUND

Friedrich Schiller University Jena

PhD in Combinatorial Scientific Computing

2012 - 2016

RWTH Aachen University

Master in Media Informatics

2010 - 2012

Sharif University Of Technology

Bachelor in Applied Mathematics

2004 - 2009

LANGUAGES

- English (Advanced), German (Advanced), Persian (Native), Spanish (B1)

WORK EXPERIENCE

Senior Data Scientist and Algorithm Engineer in Vodafone, August 2023 - Now

- Design and develop analytical graph models using combinatorial optimization, integer programming and big data methods
- The requirements analysis and evaluation of use cases with the business department
- Responsible for the code design as well as for the exploration and analysis of data, especially from unstructured and extensive big data sources
- Support the preparation and design of analytical data sets and ETL from source systems
- Visualize data and communicate insights to stakeholders
- Improve code from a software engineering view
- Time series analysis, clustering, geo-analysis of given data

Senior Data Scientist in Telekom, through Axxessio GmbH, March 2021 - July 2023

- Implement an NLU system of different components (TV, Appointment, Weather, ...)
- Implement an online annotation tools for the linguist designers to prepare utterances for training
- Implement a ranking system of preparing data for training the content entity recognition
- Design a concept for date and time utterances in the German language and providing a solution for how to be interpreted in different context
- Prepar the whole pipeline of NLU from voice recognition to executing the skills
- Implement several small tools to automatize several tasks like testing the NLU models, generating the regular expression recognizing complicated structures in the German language which are not easily recognized by Machine Learning
- Design a fuzzy search concept for a better TV related content entity recognition

Senior Data Scientist in Telekom, through MobilabSolutions, Feb. 2019 - Feb. 2021

- Similar tasks to abovementioned

Senior Software Engineer in KNIME and ScaDS, Feb. 2017 - Jan. 2019

- Design and Implementation a visualization software for large graphs based on Spark and Flink
- Develop a software system in which a user without deep knowledge of big data processing can build a graph analysis workflow graphically from simple basic operators
- Implement several preprocessing algorithms based on Big Data platforms like Graph Sampling, hierarchical graph clustering, and grouping on graph nodes
- Integrat this whole ecosystem into the KNIME software
- Analyze the real data like the patents for BOSCH using our tool from preparing to visualization

Junior Software Engineer, parallel to my study, 2012 - 2016

- Transforming a serial forward model to a parallel inverse model using MPI and OpenMP
- Preparing the code to be executed on Julich Supercomputer center in Germany
- Modernizing an old code written in Fortran and C with a better data structure

Research Projects

- **PreCol** is to compute the graph coloring and preconditioning in a way which gets benefit from Automatic Differentiation. The coloring algorithms are implemented in C++ for the needs of efficiency and parallelism. We also developed two graphical interfaces for Java and MATLAB, <https://github.com/roostam/PreCol>, 2015 – Now.
- **GraphTea** is an open source mathematical platform and library for graph algorithms and visualizations. I am a developer, designer and maintainer of project GraphTea. It is more than a group of developed algorithms, but rather a platform in which desired algorithms could be easily implemented by a normal user. The GraphTea core is written in Java on which we developed other tools like a web-user interface <https://github.com/roostam/GTea> as well as a tool for testing a hypothesis on a large list of graphs <https://github.com/roostam/GSearchTea>. A version GraphTea code is available under <https://github.com/roostam/GraphTea> and a dedicated web address is as <http://graphtheorysoftware.com>, 2012 – Now.
- **EXPLAIN** is a set of interactive learning modules used in classroom to teach scientific computing concepts. They are web-based application written in Python and Javascript. The users can also interactively develop their algorithms in an online editor, which is available in the same page as the tool, and test the results instantly. A version of the program is available under <https://roostam.github.io/explain>, 2013 – 2016.

Publication

- A list of my publications is available under my website <https://roostam.github.io>.

Teaching Experiences

- Parallel Computing 1 and 2 (MPI/OpenMP), 2016 – 2018
- Big Data, 2017
- Several seminars in Visual Analytics, 2015 – 2017
- Supervision of several Bachelor/Master theses, 2015 – 2019

Selected Talks

- Automatic Differentiation in new machine learning tools, 2018.
- A comparison between graph algorithms in Big Data and HPC platforms, 2017.
- Analyzing a huge set of graphs: A case study over conjecture checking, 2016.
- Research on different algorithms for finding hexagonal meshes, 2011
- Graph non-homomorphic parameter, Fall 2006.
- The Borsak-Ulam theorem based on the book *Using the Borsuk-Ulam Theorem: Lectures on Topological Methods in Combinatorics and Geometry*, 2005
- Graphs and Homomorphisms written by Pavol Hell (<http://www.cs.sfu.ca/~pavol/>), 2005

TECHNICAL EXPERIENCE

Programming

- Proficiency: C/C++ (about 12 years experienced, C++17), Java (about 12 years experienced), python (matplotlib, numpy, pandas, pydantic, pytorch, ...), MPI/OpenMP, Apache Spark, Apache Flink
- Experienced: Rasa, OpenGL (WebGL), GTK, BOOST, Fortran 77/90, HTML/JS/CSS, Gurobi Optimization, QGIS, Openlayers, OpenStreetMap, Leaflet

Selected Methods

- SCRUM/SAFE, Descriptive and Inferential Statistics, Machine Learning, Deep Learning, Parallel Algorithms, Critical Thinking, Mathematical Optimization

Applications

- Linux, IntelliJ Idea, CLion, PyCharm, Eclipse, Git, L^AT_EX, Qt, wxWidget, Mac

OTHER INTERESTS

- Learning new languages, Teaching Persian language, Watching Movies, Playing Violin