Shakir Showkat Sofi

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Education

Skolkovo Institute of Science and Technology — Moscow, RU
MSc Data Science, Advisor: Prof. Ivan Oseledets (Skoltech & RAS) — 2020–Current

- Thesis: "Spatiotemporal forecasting with application to the weather forecast"

Islamic University Of Science And Technology — Srinagar, J&K, India
Btech Electric Engineering, GPA: 9.18/10.0, Advisor: Dr. Shahkar A. Nahvi (IUST & IIT-Delhi) — 2015–2019

- Thesis: "Energy-Based Modeling of Dc-Dc Power Converters"

Govt.Hr.Sec School, B.K Pora — Srinagar, J&K, India
Associate Degree: Specialization in Science and Maths, Percentag: 86.3% — 2013–2014

Experience

Skolkovo Institute of Science and Technology and TENSOR FIELD — Moscow, RU
Internship — Summer 2021

- Data-driven weather forecasting
- Multivariate time series forecasting for long range Geo-spatial grid points.

QWorld — Global Quantum Network
Quantum Computing Summer School — Summer 2021

- Quantum Computing and Programming
- Qiskit, QFT and Shor's Algorithm, etc.

Jamkash Vehicleades Kashmir Pvt. Ltd, Maruati-Suzuki — Srinagar, J&K, India
Electrical Engineer — August 2019 –June 2020

- Worked in Logistic Electrical

Power Grid Corporation Of India Limited — Sub-Station Wagoora, J&K, India
Internship — Summer 2018

- Transmission And Distribution Of Electrical Energy

Power Generation House — Ganderbal, J&K, India
Industrial Visit — Summer 2018

- Hydro power generation: Turbo-generators, Turbine, Water-dam, Steam generators, etc.

Power Grid Station, under PGCIL — Sanant Nagar, Srinagar J&K, India
Industrial Visit — Summer 2018

- Control room, Power station management, Transformer repairing

Submitted Papers

1. Shakir Showkat Sofi, "Multi-application dynamic mode decomposition in low-rank tensor train framework", 8^{th} *International Conference on Mathematics and Computing,* ICMC 2022.

2. Shakir Showkat Sofi, Mosaib Ul-Munieeb, Fazil Bashir, Muneeb Ul-Hassan and Shahkar Nahvi "Energy-Based High-fidelity Modelling of Power Converters ", 10^{th} *Workshop on Modeling and Simulation of Cyber-Physical Energy Systems,* MSCPES 2022, Milan, Italy.

Skills

- **Programming and Writing:** C, V.B, HTML, SQL, LaTeX, LyX, Ms Office.
- **Computational:** Matlab, Mathematica, Octave, Python, Scikit-learn, Numpy, Pandas, Pytorch, Keras, Tensorly, etc.
- **Other:** Arduino Uno, μP-8085, μC-8051, Atmel 328P.

Languages

- **English:** Fluent in reading, writing, listening and speaking
- **Urdu:** Fluent in reading, writing, listening and speaking
- **Kashmiri:** Fluent in reading, writing, listening and speaking

Projects and Research Experience

Data-driven weather forecasting models

Research internship project under the guidance of Dr. I.Oseledets *(Co-founder and CEO, of TENSOR FIELD).* Compared different forecasting models based on deep learning (seq2seq models), dynamical system, and spectral (Koopman) based forecasting algorithms.

Tensorizing dynamic model decomposition

Tensor train decomposition enabled fast, efficient and stable implementation of dynamic mode decomposition in the tensor framework. This work was successfully completed under the supervision of Dr. Ivan Oseledets.

Comparing integer and fractional order NN for tree-species classification

The main idea was to implement fractional-order back-propagation algorithms and compare that with integer-based neural networks for multi-spectral image classification.

Shaping filter response with fractional order models

We showed fractional-order filters generalize integer order filters, allows to have more control on time and frequency responses simultaneously.

Image segmentation with topological priors

We incorporated topological priors before and in the deep neural network training procedure for improving segmentation accuracy for fine-scale structures.

State-space modeling of power converters

The basic idea was to develop and simulate the state-space mathematical models of Power electronics converters so that we can create new ones and improve the performance of existing converters.

Energy-based modeling of Dc-Dc power converters

Undergraduate thesis research project under the guidance of Dr. S.A Nahvi. Development of models based on the Euler-Lagrangian framework, due to ease of energy-based (scalar) modeling rather than force-based (vector) based, was awarded an excellent mark.

Automatic irrigation system for agriculture fields

Micro-controller (Atmel-328p) based automatic watering with Soil hydrometer humidity detector SKU: DSM058.

Research Interest

Currently, the theme of my research is space-time pattern mining using deep sequence to sequence models, spatiotemporal prediction & dimensionality reduction, especially in tensor formats, as the volume of data is increasing exponentially (for example, geo-spatial data, climate data), so I would love to advance my research in dimensionality reduction and spatiotemporal predictive modeling.

Scholarships and Certificates

Scholarships

- Graduate fellowship at Skolkovo Institute of Science and Technology, Moscow, RU.
- Merit-Cum Means Scholarship during Undergrad. by MHRD, Govt. of India.
- Graduate fellowship at National Taipei University, Taiwan

Certificates

- Rank certificate: Among top two students in Bachelor's degree.

Other

Academic Experience

- Private Tutor: Tutored 9 students in Differential Equations.
- Private and Group Tutor: Provided private tutoring for high school and college-level calculus course.

Memberships and Affilations

- American Association of Mechanical Engineers (ASME)
- International Association of Engineers (IAENG)
- World Academy of Science,Engineering and Technology (WASET)
- Institute of Research Engineers and Doctors (theIRED)

Recommendations

- Dr. Shahkar Ahmad Nahvi
  PhD Control System Engineering IIT-Delhi
  Asst. Professor Electrical Engineering, IUST, Awantipora
  Email: shahkar.nahvi@islamicuniversity.edu.in

- Mr. Muzaffar Ahmad Sofi
  Asst. Professor of Computer Science, J&K Higher Education
  Email: muzaffarsofi.g@gmail.com

Declaration: I hereby declare that above information is true according to my knowledge.