Waqar Hussain Shah

Email address: shahhussain.waqar@gmail.com **LinkedIn:** www.linkedin.com/in/waqar-hussain-shah

Website: https://sites.google.com/view/whshah

WORK EXPERIENCE

Research Assistant
Topological Data Analysis LAB at FAST-NUCES. [1 Jul 2022 – 1 Jan 2023]

City: Islamabad
Country: Pakistan

Maths Teacher
Anam School and College, Rawalpindi [19 Aug 2018 – 14 Apr 2019]

City: Rawalpindi

Mathematics lecturer
Army Public School and College Ordnance road [26 Aug 2021 – 30 Jun 2022]

City: Rawalpindi
Country: Pakistan

EDUCATION AND TRAINING

Master of Science in Mathematics
COMSATS University Islamabad [13 Sep 2019 – 13 Aug 2021]

Address: Islamabad
Website: www.comsats.edu.pk
Final grade: CGPA: 3.68\4.00
Thesis: Statistics on the Space of Persistent Diagrams with Applications

Automatic classification between normal and immature leukemic blast cancer cells is a challenging task due to their morphological similarity. We use techniques from Topological Data Analysis to extract topological and shape features. Using these features, we train a topological machine learning model. Our proposed approach captures exactly those features observed by a hematologist.

Bachelor of Science in Mathematics
University of Gujrat [21 Sep 2014 – 24 Oct 2018]

Address: Gujrat (Pakistan)
Final grade: CGPA: 3.21\4.00

MASTER'S COURSE WORK

Course Work

Topology

Advanced Topology-I

Functional Analysis

Introduction to Algebraic Geometry

Further Algebraic Geometry

Numerical linear Algebra

DIGITAL SKILLS

LAteX / Overleaf-Latex / Google Docs / Team-work oriented / Google Drive

LANGUAGE SKILLS

Mother tongue(s): **Urdu**

Other language(s):

English

LISTENING B2 **READING** B2 **WRITING** B2

SPOKEN PRODUCTION B2 **SPOKEN INTERACTION** B2

INTEREST AND SKILLS

Skills

Programming:

I am proficient in MATLAB and Python.

Language:

1. My mother tongue language is Urdu
2. I have obtained a band score of 5.5 in IELTS, with a score of 5 in listening, 5 in reading, 6 in writing, and 6.5 in speaking.

PROJECTS

Topological Data Analysis and its Application in the Detecting Lung Diseases

[1 Jul 2022 – 1 Jan 2023]

Our project is fully funded by Higher Education Commission under his National Research Program for Universities. We build a Topological Machine Learning model that can do the automatic classification of the disease as domain experts can do.

1. We used the Stoic Dataset, which was created by Cochin Hospital Paris and named Stoic-Challenge-2021 to classify and predict the severity of COVID-19 in the lungs using CT scan images.
2. The preprocessing phase involved creating a segmentation mask of the lungs using the U-Net R231 model and analyzing the shape and structure of the affected area using Lower Star Filtration (LSF) to capture ground glass opacity patterns and crazy paving.
3. Classification and regression models were then applied to differentiate between normal and COVID-19 CT images and predict the severity of COVID-19 based on captured features.

HONOURS AND AWARDS

Awarded Laptop

Chief Minster of Punjab, Pakistan [3 Jul 2017]

Scholarship

Jinnah Institute of Informatic and Commerce [14 Sep 2012]

Achieving the highest grade of A+ in my Matric exams and being awarded a full scholarship to fund my college education.

Award of Excellence

Army Public School and College Ordnance road, Rawalpindi [10 Jun 2022]

This certificate of merit acknowledges me as a highly motivated and proactive member of the faculty.

ACHIEVEMENTS

Video and Poster

[21 Apr 2021]

Presented a video on, “An introduction to Persim for Analyzing the Persistent Diagrams” in AATRN. Presented a poster about my master's thesis in AATRN. AATRN is a network of researchers and data scientists interested in Algebraic Topology.

Talk

[5 Oct 2021]

A lighting talk on, “Statistics on the Space of Persistent Diagrams with Applications” in 2nd workshop on Topological methods in Data Analysis. This virtual workshop was organized by the mathematical community of Heidelberg University, Germany.

CERTIFICATES

Introduction to Python

[30 Sep 2021 – 23 Oct 2021]

I have accomplished this course from DataCamp.

MATLAB for maths and Data Science

[30 Sep 2020 – 3 Oct 2020]

Python for Machine Learning

In this course I have learned the two very generic libraries of Python are Numpy and Pandas.

Recent developments in Applied and Computational Mathematics

[31 May 2022]

This international conference was jointly organized by COMSATS University Islamabad and society for Industrial and Applied Mathematics (SIAM-CUI) student chapter.

REFEREES

Assistant Professor

Dr. Sohail Iqbal

Department of Mathematics,

COMSATS University Islamabad

Email: sohail_iqbal@comsats.edu.pk

Assistant Professor

Dr. Umer Farooq

Department of Mathematics,

COMSATS University Islamabad, Pakistan

Email: umer_farooq@comsats.edu.pk

Assistant Professor

Dr. Khadija Farooq

Science and Humanities Department,

FAST-National University of Computer and Emerging Sciences, Islamabad, Pakistan

Email: Khadija.farooq@nu.edu.pk