HAMZA SHAFIQ

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RESEARCH EXPERIENCE

MS Research, Department of Mathematics, COMSATS University Islamabad (2021-2024)

Thesis Title: "Dynamical Analysis of the Epidemic Models of COVID-19 and Influenza"

- Developed extended mathematical models by adding vaccination effect and analyzed the stability using Maple
- Finding reproduction number by using *the next generation matrix method*
- Analysis of proofs for *Positivity, Boundedness & Consistency*
- Applying numerical scheme for simulations using MATLAB and Python
- Visualized the comparison graphs between the original model and the novel model

RESEARCH POTENTIAL

Areas of research for PhD

- Data Science and Machine Learning
- Mathematical Biology / Mathematical Modeling
- Applied and Computational Mathematics
- Analysis and Differential Equations

EDUCATION

COMSATS University Islamabad, Lahore, MS in Mathematics   **Sep 2021 – Jan 2024**
- **CGPA:** 3.5/4.0
- **Field of research:** Mathematical Biology / Mathematical Modeling
- **Thesis title:** Dynamical Analysis of the Epidemic Models of COVID-19 and Influenza

Virtual University of Pakistan, B.Ed. Secondary (1.5-Year)   **Oct 2022 – Mar 2024**
- **CGPA:** 3.13/4.0
- **Specialization:** ICT in Education

PMAS Arid Agriculture University Rawalpindi, M.Sc. Mathematics (2-Year)   **Oct 2018 – Sep 2020**
- **CGPA:** 3.62/4.0

University of Gujrat, Bachelor of Science (2-Year)   **Oct 2015 – Aug 2017**
- **Marks:** 493/800
- **Combination:** Maths A-Course, Maths B-Course, Physics

LAB EXPERIENCE

I have hands-on experience in online labs at WorldQuant University, where I am woking on diverse projects.

1. Applied Data Science Lab (currently enrolled)

i. Housing in Mexico
ii. Housing in Buenos Aires
iii. Air Quality in Nairobi
iv. Earthquake Damage in Nepal
v. Bankruptcy in Poland
vi. Customer Segmentation in the US
vii. A/B Testing at WorldQuant University
viii. Market Forecasting in India

2. Applied AI Lab: Deep Learning for Computer Vision (currently enrolled)

   i. Wildlife Conservation in Côte d'Ivoire   iv. Celebrity Sightings in India

  ii. Crop Disease in Uganda   v. Medical Data in Spain

 iii. Traffic Monitoring in Bangladesh

TEACHING EXPERIENCE

Visiting Lecturer, Govt. Graduate College, Pasrur   **Jan 2024 – Jul 2024**

- Delivering lectures for UG courses: *Group Theory, Differential Geometry, Complex Analysis, Graph Theory, Calculus-II*
- Responsible for prior assessment of curriculum, Mid-term exams, and feedback

Visiting Lecturer, Superior College, Pasrur   **April 2021 – Aug 2021**

- Delivering lectures for UG courses: *Quantitative Techniques in Business, Algebra-I, Business Statistics*

COMPETITIONS & AWARDS

1. Secured 2nd place in the *Maths Volunteers **Annual Quiz - 2024*** for "**Mathematics for Machine Learning and Data Science**" held virtually by *The Maths Volunteers Foundation*.   **(August 03, 2024)**

2. Awarded a **1-Year License** for **Coursera** through the Digital Learning and Skills Enrichment Initiative **(DLSEI)** by the Higher Education Commission **(HEC)**, Pakistan.   **(Feb 2023 - Feb 2024)**

   - This prestigious initiative provides access to a wide range of online courses and certifications from top global universities to enhance skills and promote self-development.

PROFESSIONAL CERTIFICATES

Leadership

Online Leadership Course, **Aspire Institute (Harvard Business School)**   June 2023

Effective Leadership, **HP LIFE**   Nov 29, 2024

[COURSERA]

Python 3 Programming, **University of Michigan**   Oct 22, 2023

MATLAB Programming for Engineers and Scientists, **Vanderbilt University**   Dec 30, 2023

Google Advanced Data Analytics, **GOOGLE**   Aug 27, 2024

IBM Data Science, **IBM**   Jun 27, 2023

Excel Skills for Data Analytics and Visualization, **Macquarie University**   Nov 06, 2023

Mathematics for Machine Learning, **Imperial College London**   Jul 31, 2023

Machine Learning, **Stanford University & DeepLearning.AI**   Jul 06, 2023

IBM AI Developer, **IBM**   Jul 27, 2023

Self-Driving Cars, **University of Toronto**   Aug 06, 2023

Epidemiology in Public Health Practice, **Johns Hopkins University**   Jan 03, 2024

Office Productivity Software, **SkillUp EdTech**   Feb 11, 2024

PROJECTS (coursera)

COVID19 Data Analysis Using Python	Oct 15, 2023
Compare time series predictions of COVID-19 deaths	Oct 27, 2023
Classification of COVID19 using Chest X-ray Images in Keras	Oct 28, 2023
Sentimental Analysis on COVID-19 Tweets using python	Oct 28, 2023
Predicting the Weather with Artificial Neural Networks	Nov 07, 2023
Climate Geospatial Analysis on Python with Xarray	Oct 16, 2023
Tracking Objects in Video with Particle Filters	Oct 20, 2023
Traffic Sign Classification Using Deep Learning in Python/Keras	Oct 15, 2023
Reverse and complement nucleic acid sequences (DNA, RNA) using Python	Oct 10, 2023
Neural Network Visualizer Web App with Python	Nov 07, 2023

TECHNOLOGIES & SKILLS

Programming Languages: Python, MATLAB, MarkDown, LaTeX, HTML, C++

Technologies: Python, MATLAB, Maple, Wolfram Mathematica, VS Code, Anaconda, Jupyter Notebook and Jupyter Lab, MS Office, Power BI, Tableau, Zoom, Google Classroom and Microsoft Teams

Skills: Data Science, Data Analysis, Sentimental Analysis, Spatial Analysis, Dynamical Analysis, Mathematical Analysis, Data Visualization, Machine Learning, Deep Learning, Artificial Intelligence, Web Designing, Teamwork, Communication, Problem-Solving, Office Productivity

CONFERENCES & SEMINARS (attended)

One Day International Symposium on Mathematical Sciences   **Dec 05, 2023**
COMSATS University Islamabad, Lahore

Mathematical Modeling and Scientific Computing for Industrial Research   **Nov 07-08, 2022**
(MMSCIR-2022)
Abdus Salam School of Mathematical Sciences, Lahore

REFEREES

<u>**Refree-I**</u> (Supervisor)

Dr. Sadia Arshad
Associate Professor
Department of Mathematics
COMSATS University Islamabad (CUI), Lahore
Emails: sadiaarshad@cuilahore.edu.pk
       sadia_735@yahoo.com

<u>**Refree-II**</u>

Dr. Muhammad Hussain
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<u>**Refree-III**</u>

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