VIJAY KUMAR

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PROFESSIONAL SUMMARY

I'm a doctoral candidate at Clarkson University's mathematics department. My areas of interest in research include time series and spatial data analysis; Applied Mathematics; Statistics; Air Quality Modeling; and Machine Learning. I am conducting research on air quality modeling, forecasting, and analysis of public health variables such as air pollution.

SKILLS

- Statistical analysis
- ArcGis
- Strong communication
- Strategic planning
- Data filtering
- Spatial Statistics
- Problem-solving
- Written communication
- R Programming
- Data mining
- Teamwork
- Time Management

EDUCATION

Ph.D: Mathematics
Clarkson University, Potsdam, NY, May 2023

- Member of American Aerosol Association (AAAR)
- Member of Society of Industrial and Applied Mathematics (SIAM)
- Dissertation: Application of time series & spatial analysis for accurate air quality data from low-cost sensors

Master of Science (MS): Applied Data Science
Clarkson University, Potsdam, NY, May 2023

- Graduated with **3.72/4** GPA.
- Courses: Database Modeling, Design, and Implementation, Data Warehousing, Probability and Statistics for
- Analytics, Data Mining, Information Visualization, and Machine Learning.

Master of Science (MS): Mathematics
Clarkson University, Potsdam, NY, May 2021
Graduated with **3.72/4** GPA.

Master of Science (MS): Applied Mathematics
NED University of Engineering and Technology, Karachi, Sindh, Dec 2015

- Graduated with **3.45/4** GPA.
- Dissertation: Effect of MHD on Fractionalized Maxwell Fluid in Porous Pipes.

Bachelor of Science (BS): Mathematics
Sindh University, Jamshoro, Sindh, Dec 2012

- Graduated with **3.21/4** GPA

EXPERIENCE

Professional

Instructor
Clarkson University, 2022 - Current
- Lecturing on course topics and evaluating student assignments and exams to provided constructive feedback.

MBioTS REU program graduate student coordinator (GSC)
Clarkson University, 2022 - 2022
- Liaised between administrative offices and logistical personnel for smooth program operations.
- Advised students on research projects.

Teaching Assistant
Clarkson University, 2019 - 2022
- Assisted instructor with in-class activities, grading assignments, facilitating class discussion, tutoring, and proctoring examinations.

Graduate Assistant
Clarkson University, 2018 - 2019
- Prepared course paperwork delivered lessons and graded assignments to support teaching.

Mathematics Lecturer
SMI University, 2016 - 2018
- Used instructional and tutoring strategies to help students explore foundational concepts in mathematics.

Mathematics Lecturer
NED University of Engineering and Technology, 2013 - 2016
- Taught undergrad-level courses and administered exams to students.

Mentoring
Mentored undergraduate students to make their research projects successful.
- ***McKayah Pugh, and Samuel Lowery***, Undergraduate in MathBio REU, Clarkson University Summer 2022.
- ***Isaac Kiiza***, Undergraduate in Mathematics, Clarkson University Summer 2021.
- ***Dawit Gebremichael***, Undergraduate in Mathematics, Clarkson University Summer 2021.
- ***Jeremy Clark***, Undergraduate in Computer Science, Clarkson University Spring, Summer 2020.
- ***Bridget Wangler***, Undergraduate in Engineering & Management, Clarkson University Fall 2019, Spring 2020.

Leadership

President
Pakistani Student Association at Clarkson University, 2021 - Current
- Developing leadership abilities by organizing special student activities and service projects.

- Promote diversity and inclusion.

AWARDS

- Travel Grant to present research work at the *40th Aerosol Conference* by *American Aerosol Association (AAAR), Raleigh,* NC (October 2022).
- Student Registration Waiver Grant to the *39th Aerosol Conference by the American Aerosol Association (AAAR)* (October 2021).
- Student Registration *Waiver Grant to the 38th Aerosol Conference by the American Aerosol Association (AAAR)* (October 2020).
- PhD Studies Scholarship awarded by *US Pakistan Knowledge Corridor, Higher Education Commission (HEC) of Pakistan* (August-2018).
- 15 Days Postgraduate Fellowship in *Mathematical Analysis, Modelling and Applications awarded by SISSA, Trieste, Italy* (August-2016).
- Laptop for MS Studies at NED University, *under Prime Minister Laptop Scheme awarded by Higher Education Commission (HEC) of Pakistan* (2015).
- District Government Scholarship to support BS Mathematics degree at *Sindh University, awarded by the District Government of Ghotki, Pakistan* (2009-2012).
- A School Level Scholarship was awarded by the *District Education Government, Ghotki, Pakistan* (2003).

CONFERENCES & WORKSHOPS

Workshops:

- Nominated for *Clarkson University's Graduate Leadership Development Program*, February 28-April 25, 2022, at Clarkson University, Potsdam, NY.
- Participant of *Clarkson's SRIHR-ICMR Indo-US Training Workshop on Low-Cost Air Quality Sensors and Related Data Analytics*, August 5–9, 2019 at Clarkson University, Potsdam, NY.
- Participant in a *15-day Faculty Development Program*, in August 2016 at SMI University, Karachi, Pakistan.
- Participant in a *01-day workshop on Scientific Writing*, February 2016 at the University of Karachi, Karachi, Pakistan.

Invited Speaker:

- Invited as *Session Co-Chair during Session 11 of the Instrumentation and Methods (11IM)* Raleigh, NC 40th Aerosol Conference by American Aerosol Association (AAAR) October 2022

Conference Talks:

- Understanding the source components captured by the Purple Air Network, Raleigh, NC, 40th Aerosol Conference by the American Aerosol Association (AAAR), October 2022.
- Spectral analysis of low-cost sensor network data UC Davis, Pasadena, California, ASIC, May 2022.
- Deferential Impact of COVID-19 Risk Factors on Ethnicities in the United States Clarkson University, Potsdam, NY, MCCNNY, March 2022.
- Spatiotemporal Analysis of PM2.5 in Chicago using Data from EPA and Low-Cost Sensor Network, Virtual, AAAR Virtual 39th Conference, October 2021.

- Infection vs Fatality of COVID-19 in New York State: Effect of Demographics and Poor Air Quality Virtual, AAAR 38th Virtual Conference, August 2020.
- Evaluating Spatio-temporal accuracy of LUR models using Low-cost Sensor Network Data, Clarkson University, Potsdam, NY, eRAPS, April 2020.
- Air Quality prediction using LUR Model: Parameter Reduction and Optimization UMBC Baltimore, Maryland, 13th Annual Probability and Statistics Day, April 2019.
- Air Quality prediction using LUR Model: Parameter Reduction and Optimization Clarkson University, Potsdam-NY, RAPS spring 2018, April 2019.
- Air Quality prediction using LUR Model: Parameter Reduction and Optimization Clarkson University, Potsdam-NY, RAPS spring 2018, April 2019.
- Fractionalized MHD Maxwell fluid through porous cylinders, Recent Advances in Pure and Applied Mathematics (RAPAM'16), QUEST Nawabshah Pakistan, January 2016.
- Effect of MHD on fractionalized Maxwell fluid between coaxial cylinders, NED UET Karachi Pakistan, First International Conference on Chemical and Material Processing, December 2015.
- Effect of MHD on fractionalized Maxwell fluid between coaxial cylinders, Institute of Space and Planetary Astrophysics Karachi Pakistan, Third National Conference on Space Science and Technology, October 2015.

PUBLICATIONS

1. *Source components captured by low-cost sensor network data* (joint with Dinushani Senarathna, Supraja Gurajala, William Olsen, Shantanu Sur, Sumona Mondal, and Suresh Dhaniyala). https://doi.org/10.26434/chemrxiv-2023-7wtxs
2. *COVID-19 in the United States during pre-vaccination period: Shifting impact of sociodemographic factors and air pollution* (joint with Chaya Chaipitakporn, Prashant Athavale, Thevasha Sathiyakumar, Marko Budisic, Sumona Mondal, and Shantanu Sur). Status (published, October, 2022). (Frontiers in Epidemiology - Infectious Disease Epidemiology). https://doi.org/10.3389/fepid.2022.927189
3. *Comparative Study of the Fractional-Order Crime System as a Social Epidemic of the USA Scenario* (joint with Mohammad Partohaghighi, and Ali Akg□ul). Status (published, July 2022). (International Journal of Applied and Computational Mathematics). https://doi.org/10.1007/s40819-022-01399-x
4. *Differential Impact of COVID-19 Risk Factors on Ethnicities in the United States* (joint with Prashant Athavale, Jeremy Clark, Sumona Mondal, and Shantanu Sur). Status (published, December 2021). (Frontiers in Public Health). https://doi.org/10.3389/fpubh.2021.743003
5. *COVID-19 in New York state: Effects of demographics and air quality on infection and fatality* (joint with Sumona Mondal, Chaya Chaipitakporn, Bridget Wangler, Supraja Gurajal, Suresh Dhaniyala Shantanu Sur). Status (published, February 2022). (Science of The Total Environment). https://doi.org/10.1016/j.scitotenv.2021.150536
6. *Fractionalized Magnetohydrodynamics (MHD) Of the Maxwell Fluid Through Porous Cylinders* (joint with Muhammad Jamil, Muhammad Zafarullah, Azam Khan). Status (published, January 2021). (Special Topics & Reviews in Porous Media: An International Journal). https://doi.org/10.1615/SpecialTopicsRevPorousMedia.2021033214