

Dr. Saima Gul

ASSISTANT PROFESSOR

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I am a Mathematician with deep interest in Mathematical modelling and analysis. My area of research is non local differential equations and integral transformations.

PhD in Mathematics, MASSEY UNIVERSITY, Palmerston North, New Zealand

Functional differential equations arising in the study of a cell growth model
<https://mro.massey.ac.nz/handle/10179/15306>

HEC & NED approved PhD supervisor, HEC, Islamabad.

Publications

Published journal articles

- 2025 **M. Y. Tufail and S. Gul. Conformal pattern in the growth of human skulls**, *Acta Biotheoretica*, vol: 73 (13), 2025, <https://doi.org/10.1007/s10441-025-09503-6> ISSN: 1572-8358, 0001-5342, JCR indexed journal.
- 2025 **M. Y. Tufail, S. Gul. Conformal image registration using the discretised Cauchy-Riemann equations**, *The ANZIAM Journal*, 2025, <https://doi.org/10.1017/S144618112500001X>, ISSN: 1446-1811, 1446-8735, JCR indexed Journal
- 2025 **M. Y. Tufail, S. Gul. Comprehensive comparison between artificial intelligence and multiple regression: prediction of Palmerston North's temperature**, *Discover Sustainability*, pp:1-22, vol: 6 (1), 2025, <https://doi.org/10.1007/s43621-024-00745-x>, ISSN: 2662-9984, JCR indexed Journal
- 2025 **M. Y. Tufail, S. Gul, S. Ali, S. S. S. Zia, S. A. Ali. The Influence of characteristics of the Azores High on surface climate: A case study for Peninsular Spain**, *Journal of Environmental Engineering and Science*, pp: 49-57, vol: 20 (1), 2025, <https://doi.org/10.1680/jenes.24.00035>, ISSN: 1496-256X, 1496-2551, JCR indexed journal

- 2025 **M. Y. Tufail, S. Gul. GUI of complex plane on Excel spreadsheets,** *Revista Mexicana de Física E*, pp: 1–3, vol: 22 (1), 2025, <https://doi.org/10.31349/RevMexFisE.22.010208>, ISSN: 2683-2216, ISI, Scopus indexed journal
- 2024 **M. Y. Tufail and S. Gul. Artificial intelligence and statistical regression for the prediction of temperature over Sukkur region,** *International Journal of Artificial Intelligence & Mathematical Sciences*, pp: 50–61, vol: 3 (2), 2024, <https://doi.org/10.58921/ijaims.v3i2.125>, ISSN: 2958-0153, 2958-5228, HEC recognised Journal
- 2024 **M. Y. Tufail, S. Gul, L. Jaben, S. Rasheed and S. Zia. A multiregressed COA-SAM model for predicting seasonal streamflow variability: A case study over Murray River Basin,** *Global NEST Journal*, PP: 1–9, vol: 26 (3), 2024, <https://doi.org/10.30955/gnj.005329>, ISSN: 1790-7632, JCR indexed Journal
- 2024 **S. Gul, M. Y. Tufail. GUI for conic sections: parabola, ellipse and hyperbola,** *Revista Mexicana de Física E*, pp: 1–5, vol: 21 (1), 2024, <https://doi.org/10.31349/RevMexFisE.21.010203>, ISSN: 2683-2216, ISI, Scopus indexed journal, ISI, Scopus indexed journal
- 2023 **M. Y. Tufail and S. Gul. Image registration using the rigid group,** *Scientific Inquiry and Review (SIR)*, pp: 71–86, vol: 7 (1), 2023, <https://doi.org/10.32350/sir.71.05>, ISSN: 2521-2435, 2521-2427, HEC recognised Journal
- 2022 **M. Y. Tufail and S. Gul. Statistical analysis for the traffic police activity: Nashville, Tennessee, USA,** *KIET Journal of Computing and Information Sciences (KJCIS)*, pp: 67–84, vol: 5 (3), 2022, <https://doi.org/10.51153/kjcis.v5i2.135>, ISSN: 2616-9592, 2710-5075, HEC recognised Journal
- 2016 **B. van Brunt, S. Gul and G. C. Wake. A cell growth model adapted for the minimum cell size division,** *ANZIAM*, ISSN: 1446-1811, 1446-8735, JCR indexed

Accepted articles

- 2025 **M. Y. Tufail, S. Gul, S. A. A. Hashmi. Interactive MATLAB GUI for Exploring Extreme Values in Bivariate Functions,** *Accepted for vol: 23 (1) in Revista Mexicana de Física E*, ISSN: 2683-2216, ISI, Scopus indexed journal

Submitted journal articles

- 2025 **M. Y. Tufail, S. Gul. Harmonic constraint for conformal image registration**, submitted to *Journal of Mathematical Imaging and Vision*, 2025, ISSN: 1573-7683, 0924-9907, JCR indexed Journal
- 2025 **M. Y. Tufail and S. Gul. An optimisation over the Möbius group for optimal solution in image registration.**, Submitted to *Punjab University Journal of Mathematics*, ISSN: 1016-2526, JCR indexed Journal.
- 2025 **M. Y. Tufail, S. Gul. Fuzzy Probabilistic Learning for Thyroid Hormonal Imbalance Detection**, submitted to *Bio-Medical Materials and Engineering*, 2025, ISSN: 0959-2989, JCR indexed Journal
- 2024 **M. Y. Tufail, S. Gul. Prediction for the precipitation (rainfall) of Sukkur region using artificial neural network, multiple regression and supervised machine learning**, submitted to *Mindanao Journal of Science and Technology*, ISSN: 2244-0410, 2449-3686, JCR indexed Journal

Workshops & Research Talks

- 2018 **A cell growth model adapted for minimum cell size division**, ANZIAM2018 Conference, (5-9 February), Hobart, Australia
- 2016 **A cell growth model adapted for minimum cell size division**, ANZIAM2016 Conference, (7 - 11 February) Canberra, Australia
- 2016 **Second Order Functional Differential Equation Involving Hermite Operator**, NZMS Colloquium, (5 - 8 December), Victoria University, Wellington
- 2015 **Mathematics-in-Industry NZ (MINZ)**, (29 June - 03 July), Atrium Building, Massey University, Albany, Auckland, New Zealand
- 2014 **A Cell Growth Model For Minimum Cell Size**, 4th Annual Interdisciplinary Doctoral Students Research Symposium organised by MUPSA, (28-29th October), Palmerston North, New Zealand
- 2014 **Foxton Fizz: Workshop on Geometry and Numerics**, (11 - 14 February), Foxton, Palmerston North, New Zealand
- 2013 **Mellin Transform To Solve Pantograph Type Functional Differential Equations**, NZMASP2013, (11 - 14 November), University of Canterbury Cass field station Christchurch, New Zealand
- 2013 **Geometric Mechanics and Shape**, (13 - 19 January), Ohope Beach, Whakatane, New Zealand

- 2012 ***Different techniques and methods for solving advanced functional differential equations***, NZMS Colloquium, (4 - 6 December), AgHort building, Massey University Palmerston North, New Zealand
- 2012 ***Winterschule in Numerical Differential Equations***, (7 - 8 May), Business Studies Central, Massey University, Palmerston North, New Zealand
- 2012 ***Different techniques and methods for solving advanced functional differential equations***, 15th Manawatu-Wellington Applied Mathematics Conference, (19th November), Massey University, Palmerston North
- 2012 ***Convolution technique to solve functional differential equations.***, IFS post graduate seminar, Massey University, Palmerston North

■ Supervision

1. PhD supervision:

- *A Mathematical Framework for Predictive Modeling of High-Water Levels in Sindh*
Capacity: Primary supervisor
Candidate: Mr. Aamir
Outcome: In progress

2. MS-Supervision:

- *Brain stroke prediction: An artificial intelligence based risk assessment model*
Capacity: Primary supervisor
Candidate: Hafiz Syed Muhammad Kashif
Outcome: In Progress
- *Comparing Artificial intelligence and Fuzzy learning for the prediction of Cardio vascular disease*
Capacity: Co-supervisor
Candidate: Ms Maham Fahim
Outcome: In Progress
- *Spatial and temporal analysis of rainfall*
Capacity: Co-supervisor
Candidate: Muhammad Hunain Anwar
Outcome: completed
- *A Study on Analytic Solution to a functional differential equation arising in a cell growth model*
Capacity: Primary supervisor
Candidate: Bushra Rais
Outcome: completed
- *Solutions to a functional differential equations arising in the cell growth model*
Capacity: Co-supervisor
Candidate: Iqra Nawaz
Outcome: completed
- *Comparison of rigid registration with different optimisation techniques*
Capacity: Co-supervisor.
Candidate: Aizaz Hussain
Outcome: completed
- *Comparison of rigid registration with different objective functions*
Capacity: Co-supervisor

Candidate: Farzana Yasmeen

Outcome: completed

Taught Courses

During my teaching career I have taught variety of courses to undergraduate and masters students such as:

- **Calculus**
- **Advanced Calculus**
- **Linear Algebra**
- **Ordinary differential equations**
- **Transforms and their applications**
- **Partial differential equations**
- **Number Theory**
- **Complex analysis**
- **Multi variable Calculus**
- **Discrete Mathematics**