DHAIRYA SHAH

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EDUCATION

❑ **Imperial College London, United Kingdom** **10-2022 – 10-2023**
Master of Science in Applied Mathematics **Grade: Distinction**

- Selected Modules: Tensor Calculus and General Relativity, Special Relativity and Electromagnetism, Classical Dynamics, Vortex Dynamics, Applied Complex Analysis, Quantum Mechanics – I

❑ **Pandit Deendayal Energy University (PDEU), India** **07-2017 – 06-2021**
Bachelor of Science (Hons.)* in Mathematics and *Diploma in Liberal Studies **CPI: 9.10/10**

- Selected Modules: Differential Geometry, Topology, Mathematical Physics, Integral Equations, Integral Transforms, Special Functions, Differential Equations, Real Analysis, Fluid Dynamics, C/C++, MATLAB

RESEARCH EXPERIENCE

❑ ***MSc Thesis:***
Local Solution to Electro-Capillary Phenomenon near Sharp Corner **10-2022 – 09-2023**

- Investigated the behaviour of the voltage local to the triple contact point for Electrowetting phenomenon
- Derived Eigenvalue condition near the triple contact point, demonstrating that the corresponding equipotential lines do not form eddies; Supervisor – Dr Samuel Brzezicki; preprint as outcome of collaboration

❑ ***BSc Thesis:***
Numerical Methods for Solutions of One Variable Nonlinear Equations **07-2019 – 06-2021**

- Categorised all existing methods in four families and devised an analogy for interconversion
- Developed a set of efficient methods and showcased the fixed-point family as the most efficient and stable; resulting in a conference proceeding; Supervisors – Dr Manoj Sahni and Dr Ritu Sahni

❑ ***Research Collaboration:***
Novel Formulae for Series Involving Floor and Ceiling Functions **06-2019 – 04-2022**

- Formulated two theorems to derive over 40 novel results pertaining to Floor and Ceiling functions
- Provided generalisations for different finite and infinite series as well as for the cases of Generalized Dirichlet series such as Riemann, Hurwitz, and Lerch Zeta functions; resulting in two published articles (I, II)

❑ ***BSc Project II:*** Applications of the Fuzzy Set Theory **01-2018 – 04-2019**

- Derived a solution for Cauchy-Euler equation using generalised trapezoidal intuitionistic fuzzy numbers
- Fuzzified generalized Newton Raphson type method to solve one variable equations; resulting in four articles; Supervisors – Dr Manoj Sahni, Dr Ritu Sahni and Dr Rajkumar Verma

❑ ***BSc Project I:*** Fixed Point Theory and Numerical Methods **08-2017 – 11-2019**

- Obtained a formula to find exact number of iterations required for fixed-point iteration method
- Amalgamated the Fixed-Point and Newton-Raphson method to demonstrate that the integrated methods converge faster than the original pair; resulting in an article and a conference proceeding

SELECTED PUBLICATIONS

[1] ***D. Shah***, Y. Liu, and S. Brzezicki. "Discrete Contact Angles and Electric Field Singularity in Electrowetting: A Multi-Scale Complex Potential Analysis". *arXiv preprint* (2025). DOI: 10.48550/arXiv.2511.11556.

[2] ***D. Shah*** et al. "Series of Floor and Ceiling Function—Part I: Partial Summations". *Mathematics* 10.7 (2022), p. 1178. DOI: 10.3390/math10071178.

[3] ***D. Shah*** et al. "Series of Floor and Ceiling Functions—Part II: Infinite Series". *Mathematics* 10.9 (2022), p. 1566. DOI: 10.3390/math10091566.

[4] M. Sahni, ***D. Shah***, and R. Sahni. "A new modified accelerated iterative scheme using amalgamation of fixed point and NR method". *Journal of Interdisciplinary Mathematics* 22.5 (2019), pp. 679–688. DOI: 10.1080/09720502.2019.1649035.

[5] ***D. Shah*** and M. Sahni. "DMS way of finding the optimum number of Iterations for fixed point Iteration method". *Proceedings of the World Congress on Engineering*. Vol. 1. 2018, pp. 87–89. ISBN: 978-988-14047-9-4.

H-index: 4, Citations: 38 (as of Dec 2025) – google scholar account

AWARD AND GRANT

- Received **Certificate of Merit (Student)** for the 2018 International Conference of Applied and Engineering Mathematics for the paper entitled "DMS Way of Finding the Optimum Number of Iterations for Fixed Point Iteration Method"
- Awarded **Travel Grant** of **65000 INR** $\approx$ **£700** in 2018 by Pandit Deendayal Energy University to present a conference paper in the U.K.

PRESENTATIONS AND DEFENCES

- Postgraduate Thesis Defence – *Local Solution to Electro-Capillary Phenomenon near Sharp Corner*
  Department of Mathematics, **Imperial College London, UK** **18th Sep 2023**
- Postgraduate Poster Presentation – *Complex Analytical Approach to Electrowetting*
  Department of Mathematics, **Imperial College London, UK** **26th Jul 2023**
- Undergraduate Thesis Defence – *On Numerical Methods for Solutions of One Variable Nonlinear Equations*
  School of Liberal Studies, **Pandit Deendayal Energy University, India** **2nd Jun 2021**
- Conference Presentation – *Finding the optimum number of iterations for Fixed Point Iteration Method*
  2018 IAENG **World Congress on Engineering 2018, London, UK** **5th Jul 2018**

TEACHING EXPERIENCE

- **The Regis School, Bognor Regis** *Science and Mathematics Teacher* **09-2025 – 08-2026**
- **The Charter School North Dulwich** *Maths & SEN Graduate Teaching Assistant* **09-2024 – 08-2025**
- **TeamUp - SYLA, London** *Mathematics Volunteer Tutor* **11-2024 – 02-2025**
- **Cardinal Hume Centre, London** *Mathematics Homework Club Volunteer* **05-2024 – 07-2025**
- **PDEU, Gandhinagar** *Mathematical Relativity Course Facilitator* **10-2023 – 12-2023**
- **PDEU, Gandhinagar** *Foundations of Mathematics Course Facilitator* **12-2019 – 03-2020**
- **Yusuf Mehrally NGO, Kutch** *Science and Mathematics Volunteer Teacher* **12-2018 – 01-2019**

KEY ACADEMIC ENGAGEMENTS

- **Department of Mathematics, ICL, UK**
  MSc Programme Representative **10-2022 – 09-2023**
- **Second International Conference on Mathematical Modeling, Computational Intelligence Techniques and Renewable Energy (MMCITRE) - 2021**
  Head, Logistics Committee **6th to 8th Feb 2021**
- **First International Conference MMCITRE - 2020**
  Head, Associate Committee **21st to 23rd Feb 2020**
- **Brahmand - The Astronomy Club of PDEU**
  President **07-2019 – 06-2020**
- **Naaz - The LGBT+ Support Club of PDEU**
  Logistics Head **07-2019 – 06-2020**

RELEVANT SKILLS

- **Proficiency in Programming Languages**: Python, Wolfram Language, C/C++, MATLAB
- **Proficiency in Operating Systems & Tools**: Debian Linux, Windows, Git, Github, LaTeX, Google Collabetory, Libre/Microsoft Office