DHAIRYA SHAH

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EDUCATION

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

- Achieved excellence in courses such as Tensor Calculus and General Relativity, Special Relativity and Electromagnetism, Classical Dynamics showcasing a strong foundation in theoretical frameworks essential for advanced studies
- Demonstrated proficiency in Applied Complex Analysis, Quantum Mechanics – I and Vortex Dynamics, underscoring a deep understanding of mathematical principles relevant to theoretical physics
- Other Modules: Numerical Solutions of Ordinary Differential Equations, Methods for Data Science

❑ **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**

- Received perfect scores (10/10) in all mathematical modules across eight semesters, setting an unbroken record
- Demonstrated mastery in foundational mathematical physics concepts, including Differential Geometry, Real Analysis, Complex Analysis, and Fluid Mechanics, providing a strong basis for advanced studies in theoretical physics
- Selected Modules: Integral Equations, Integral Transforms, Topology, Special Functions, Partial Differential Equations

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 (TCP) for the Electrowetting phenomenon
- Derived Eigenvalue condition near TCP, demonstrating that the corresponding equipotential lines do not form eddies

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

- Categorised methods developed over the last 250 years in four families and devised an analogy for interconversion
- Developed a set of efficient methods in fixed-point family and implemented different methods to solve nonlinear equations
- Showcased the fixed-point family as the most efficient and stable; resulting in a conference proceeding: 1

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

- Formulated and applied two original 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 the solution for second order Cauchy-Euler equation using generalised trapezoidal intuitionistic fuzzy numbers
- Fuzzified generalized Newton Raphson type method to solve one variable equations; resulting in four articles

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

- Obtained a formula that provides exact number of iterations required based on initial guess for the fixed-point method
- Amalgamated the Fixed-Point and Newton-Raphson method to demonstrate that the integrated methods converge faster than the original pair; resulting in two articles and a conference proceeding

H-index: 3, Citations: 29 (as of March 2024), here's my 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"
- ❑ Secured **Travel Grant** of **65000 INR** awarded in 2018 by Pandit Deendayal Energy University for conference paper presentation in the U.K.

TEACHING EXPERIENCE

❑ **Mathematics and Astronomy Clubs, PDEU**
Course Facilitator of ***Mathematical Aspects of Relativity*** **10-2023 – 12-2023**

- Designed, developed and delivered a 30-hour course on Mathematical Aspects of Relativity to undergraduate students, with focus on Lagrangian and Hamiltonian dynamics as well as advanced topics in Special Relativity
- Applied aforementioned concepts to teach principles such as the conservation of momentum and energy, as well as derivations such as $E = mc^2$, thereby fostering a deeper understanding of concepts of Relativity
- Received positive and encouraging feedback, where students stated increased confidence in comprehending complex mathematical concepts and a heightened appreciation for the role of mathematics in scientific inquiry

❑ **Office of International Relations, PDEU**
Course Facilitator & Teacher of ***Foundations of Mathematics*** **12-2019 – 03-2020**

- Developed instructional material focused on reinforcing foundational mathematics skills and taught twelve international engineering students, resulting in a 92% pass rate in subsequent mathematics exams
- Implemented innovative pedagogical methods, which included examples from real-world applications and visualisation methods to enhance understanding of key mathematics fundamentals
- Received motivational along with formative feedback from students and Head of Department, Mathematics

❑ **Yusuf Mehrally Centre (NGO), Kutch**
Teacher of ***Science & Mathematics*** **12-2018 – 01-2019**

- Undertook the initiative to teach Mathematics and Science to underprivileged 8th-grade students to fill in for the absence of a full-time teacher
- Tailored teaching methods to meet the needs of students with special learning requirements, incorporating real-world examples with interactive lessons, resulting in a 20% increase in exam pass rates
- Demonstrated adaptability and dedication in ensuring higher success rate despite challenging circumstances faced by the students

KEY ACADEMIC ENGAGEMENTS

❑ **Department of Mathematics, ICL, UK**
MSc Programme Representative **10-2022 – 09-2023**

- Chaired PG Student-Staff Committee meetings, ensuring seamless communication and implementation of key student suggestions and concerns as well as participated in various meetings by university and union staff
- Performed the role of liaison between the MSc cohort and the department, soliciting student feedback and sharing the areas of learning and opportunities appropriately with both parties

❑ **Board of Studies, PDEU**
Student Representative for the Department of Mathematics **03-2021**

- Proposed a cohesive course structure for the B.Sc.(Hons.) Mathematics program, in alignment with international standards, which was unanimously accepted and implemented forthwith, receiving appreciation
- Enhanced students' subject proficiency through the suggested course structure, resulting in 80% Mathematics graduates getting offers from top-ranked universities

❑ **Second International Conference on Mathematical Modeling, Computational Intelligence Techniques and Renewable Energy (MMCITRE) - 2021**
Head, Associate and Logistics Committee **6th to 8th Feb 2021**

First International Conference MMCITRE - 2020
Head, Associate Committee **21st to 23rd Feb 2020**

- Directed associate and logistic committees of 30+ undergraduate and postgraduate students, overseeing hospitality, management, and other key departments in organising both conferences
- Managed a hybrid conference (offline and online) with 120+ presenters and speakers in 2021 and 90+ in 2020, successfully navigating through the challenges posed by the COVID-19 pandemic
- Received accolades from HOD, professors, keynote speakers, and attendees for displaying exemplary leadership abilities and executing seamless conferences amidst challenging circumstances

OTHER NOTABLE INVOLVEMENTS

❑ **Bilimora College, SGVNM University, India**
Guest Speaker **17 Jan 2019 & 29 Jun 2019**

- Inspired tribal students with captivating lectures on academic research avenues in science and mathematics at undergraduate levels, earning accolades for uniquely conveying the importance of natural sciences
- Appreciated and acknowledged by the college for increasing MSc admissions by 10-15% in subsequent years

❑ **Brahmand - The Astronomy Club, PDEU**
President **07-2019 – 06-2020**

- Organised 13 impactful events, including telescope making workshops and technical discussions, fostering a culture of scientific curiosity within the community
- Led a diverse team of 42 members, integrating varied skills and expertise to successfully achieve club objectives
- Adapted innovatively to the challenges of the pandemic by spearheading the development and launch of a club website, ensuring seamless communication and continuity of club activities

❑ **Dinsha Patel Planetarium, Nadiad, India**
Docent **08-2016 – 06-2017**

- Offered insightful guidance and narration as a docent, enlightening visitors about the significance of the planetarium's image gallery; hence, fostering a deeper appreciation for astronomy in laypeople

RELEVANT SKILLS

❑ **Language Proficiency**

- English (C1 – 8.0 IELTS), Hindi (Native), Gujarati (Native)

❑ **Proficiency in Operating Systems & Tools**

- Linux (used daily), Debian, Fedora, Windows, Git, Github, LaTeX, Google Collabetory, Libre/Microsoft Office

❑ **Proficiency in Programming Languages**

- Python, Wolfram Language, C/C++, MATLAB