DHAIRYA SHAH

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EDUCATION

❑ **Imperial College London, United Kingdom**   **10-2022 – 10-2023**
Master of Science in Applied Mathematics   **Grade: Distinction**
- Modules: Tensor Calculus & General Relativity, Special Relativity & Electromagnetism, Quantum Mechanics-I, Vortex Dynamics, Classical Dynamics, Applied Complex Analysis, Numerical Solutions of ODEs, 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**
- Selected Modules: Differential Geometry, Topology, Integral Equations, Mathematical Physics, Integral Transforms, Differential Equations, Real Analysis, Fluid Mechanics, Special Functions, Applied Statistics, Operations Research

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**
- Derived 40+ novel results involving the Floor and Ceiling functions using two proved theorems
- Provided generalisations of different infinite series as well as some cases of Generalised Dirichlet series such as (Riemann, Hurwitz, Lerch) Zeta functions and Polylogarithms; articles as a result of the collaboration: 2 (I, II)

❑ *BSc: Research Collaboration:* Novel Formulae for Series Involving Floor and Ceiling Functions   **06-2019 – 04-2022**
- Derived over 40 novel results involving Floor and Ceiling functions using two proved theorems
- Provided generalizations for different infinite series and cases of Generalized Dirichlet series such as Riemann, Hurwitz, and Lerch Zeta functions, resulting in two published articles (I, II)

❑ *BSc Research Collaboration:* Novel formulae for series involving Floor and Ceiling functions
- Derived over 40 novel results involving the Floor and Ceiling functions using two proved theorems.
- Provided generalizations of different infinite series as well as some cases of Generalized Dirichlet series such as (Riemann, Hurwitz, Lerch) Zeta functions and Polylogarithms; resulting in two 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; articles as a result of project: 4

❑ *BSc Project II:* Applications of the Fuzzy Set Theory
- Derived the solution for the second-order Cauchy-Euler equation using generalized 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 display that the integrated methods converge faster than the original pair; article and conference proceeding as a result of project: 2

H-index: 3, Citations: 29 (as of February 2024), here's my google scholar account

❑ *BSc Project I:* Fixed Point Theory and Numerical Methods
- Obtained a formula that provides the 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.

AWARD AND GRANT

❑ Awarded 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 MMCITRE - 2021**
Head, Associate and Logistics Committee **6 – 8 Feb 2021**

- Directed associate and logistic committees of 30+ undergraduate and postgraduate students, overseeing hospitality, management, and other departments in organising the conference
- Managed a hybrid conference (offline and online) with 120+ presenters and speakers successfully, despite challenges posed by the COVID-19 pandemic
- Received accolades from HOD, professors, and keynote speakers for displaying exemplary leadership abilities

❑

First International Conference on Mathematical Modeling, Computational Intelligence Techniques and Renewable Energy (MMCITRE) - 2020
Head, Associate Committee **21st to 23rd Feb 2020**

- Managed and acted upon inquiries from 90+ guest speakers and participants, ensuring smooth communication and coordination, which earned recognition from peers, faculties, and attendees for the seamless execution
- Demonstrated effective leadership amidst challenges, including navigating through the early stages of the pandemic, and successfully executed the first-of-its-kind conference in the state of Gujarat

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