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 last 250 years in four families and devised an analogy for interconversion
- Developed a set of methods in fixed-point family and implemented different methods to solve non-linear equations
- Showcased the fixed-point family as the most efficient and stable; conference proceeding as as result of the thesis: 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: 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 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

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

- Investigated the behavior of voltage near the triple contact point (TCP) for the Electrowetting phenomenon.
- Derived Eigenvalue conditions near the TCP, ensuring the formation of equipotential lines without eddies.

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

- Categorized methods for solving nonlinear equations over the past 250 years into four families and established an analogy for interconversion.
- Developed and implemented efficient methods within the fixed-point family for solving nonlinear equations.
- Showcased the superiority of the fixed-point family in terms of efficiency and stability, resulting in a conference proceeding (1).

❑ ***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)

❑ ***MSc Thesis:*** **Local Solution to Electro-Capillary Phenomenon near Sharp Corner**

- Investigated the behavior of the voltage local to the triple contact point (TCP) for the Electrowetting phenomenon.
- Derived Eigenvalue condition near the TCP, demonstrating that the corresponding equipotential lines do not form eddies.

❑ ***BSc Thesis:*** **Numerical Methods for Solutions of One Variable Nonlinear Equations**

- Categorized methods developed over the last 250 years into four families and devised an analogy for interconversion.
- Developed a set of methods in the 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

- 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

- 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

- 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

❑ **Mathematical Aspects of Relativity**
Crash Course Teacher (Volunteering), **Maths and Astronomy clubs, PDEU** **Since 10-2023**

- Designed, developed and delivering a Mathematics intensive course on relativity to Science and Engineering students

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

- Assessed students' mathematical skills
- Designed a curriculum for foundations of mathematics based on the requirements of the university program
- Taught the course to 12 international students keeping their skills and university requirements into consideration

❑ **Science and Mathematics**
Teacher, **Yusuf Mehrally Centre (YMC), Kutch** **12-2018 – 01-2019**

- Taught Science and Mathematics for 20 days to underprivileged 8th grade students during the rural internship

KEY ACADEMIC ENGAGEMENTS

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

- Gathered feedback and communicated best practices by working as a liaison between MSc cohort, the university staff and the faculty
- Attended various meetings by College and union staff to ensure key student-related issues are resolved
- Chaired PG SSC meetings and ensured the seamless flow of the meeting agenda

❑

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

- Suggested a new cohesive flow of the courses of B.Sc. (Hons.) Mathematics for 2021-22 batch onwards keeping the personal experience and current teaching structure of leading world institutions in the primary view

❑ **Head, Associate and Logistics Committee**
Second International Conference MMCITRE – 2021 **06-08, Feb. 2021**

- Led the committee to organise the conference with 120+ presenters and speakers in a hybrid mode (offline and online)
- Communicated with the keynote speakers and session chairs regarding the official formalities

❑ **Head, Associate Committee**
First International Conference MMCITRE -2020 **21-23, Feb. 2020**

- Led the associate committee departments which included logistics, hospitality, management and other four departments
- Communicated and made decisions regarding the queries and doubts of the associate committee as well as managed inquiries of 90+ the guest speakers and participants

OTHER NOTABLE INVOLVEMENTS

❑ **Guest Speaker**
Bilimora College, SGVNM University **17-01-2019 & 29-06-2019**

- Delivered lectures to tribal students on academic research avenues in science and mathematics at undergraduate levels
- Received appreciation for the lectures as there was a sharp rise in MSc admissions in subsequent academic years

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

- Organized 13 events like Telescope making, technical discussions, over the span of one academic year
- Led a team of 42 committee members having different technical and non-technical departments
- During my presidency, our club observed a smooth transition of events from offline to online due the pandemic and managed to catch attention of large audience despite the odds

❑ **Student Coordinator**
IFEHE National Creativity Aptitude Test (NCAT) **2018**

- Contributed as student invigilator in conducting National Creativity Aptitude Test 2018

❑ **Docent**
Dinsha Patel Planetarium, Bal-kanji-Bari, Nadiad **2016-2017**

- Volunteered as a docent (guide and narrator) to help laymen to understand the image gallery of the planetarium

RELEVANT SKILLS

❑ **Programming Languages**
- Python, Wolfram Language, C++, MATLAB

❑ **Operating Systems & Tools**
- Linux (used daily), Debian, Fedora, Windows, Git, Github, LaTeX, Google Collabetory, Libre/Microsoft Office

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