



Irvine Homi Patalwala

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ABOUT ME

My research interests span mathematics, data science, and artificial intelligence, driven by an insatiable curiosity and a penchant for critical thinking. I'm fascinated by how philosophical concepts and ideas are formalized into mathematical frameworks and the abstraction-formalization cycle that follows. I thrive on unraveling the genesis of theories, as I firmly believe that deep understanding and visualization of any mathematical framework leads to clearer and improved practical application. With strong proficiency in algorithm design and a keen understanding of semantics in programming, I am well-equipped to tackle complex challenges in these interdisciplinary fields. Additionally, I aim to further explore and develop my original idea, the 'Pars Hypothesis.'

SKILLS & RESEARCH INTERESTS

Research Interests

- Set Theory & Logic, Category Theory, Combinatorics, Modern Algebra,
- Mathematical Modelling, Simulation, Optimization, Scientific Computing, Computational Mathematics
- Algorithms, Database, Data Science
- Artificial Intelligence, Machine Learning, Ontology, Knowledge Graphs
- Probability, Statistics, Stochastic Processes, Stochastic Differential Equations, Measure Theory
- Financial Mathematics

EDUCATION AND TRAINING

PhD in Intelligent Systems Engineering

University of Verona [01/10/2024 – Current]

Website: <https://www.corsi.univr.it/?ent=cs&id=1192&menu=home&lang=en>

Master's Degree in Mathematical Engineering (Intermaths Double Degree Program)

DISIM, University of L'Aquila, Italy / University of Silesia in Katowice, Poland [08/10/2018 – 17/07/2020]

City: L'Aquila | Country: Italy | Website: <https://www.intermaths.eu/double-degrees> | Field(s) of study: Natural sciences, mathematics and statistics: • Inter-disciplinary programmes and qualifications involving natural sciences, mathematics and statistics | Final grade: 100/110 (Italy) & 4.64/5 (Poland) | Type of credits: ECTS | Number of credits: 133 | Thesis: Statistical Linear Models And Their Application To Finance

In my master's thesis, I introduced an original idea, the '**Pars Hypothesis**', that aims to revolutionize mathematical modeling by offering a novel perspective on model validity.

Master's Degree in Financial Mathematics

The Maharaja Sayajirao University of Baroda [01/07/2016 – 01/06/2018]

City: Vadodara | Country: India | Website: <https://msubaroda.ac.in/index.php/academics/FTE/department/AMAT/Programs/98> | Field(s) of study: Financial Mathematics | Final grade: First class with distinction (84.15%) | Thesis: Implied Volatility Smile In Regime Switching Market Model With Markov Regimes

The computational findings from my master's thesis culminated in the publication of an article in Applied Stochastic Models in Business & Industry. (**Manuscript no: ASMB-22-35**)

Master's Degree in Mathematics

Savitribai Phule Pune University (formerly University of Pune)

City: Pune | Country: India | Website: <http://math.unipune.ac.in/> | Field(s) of study: Pure Mathematics | Final grade: A (62%) | Thesis: No thesis only coursework

Bachelor's Degree in Mathematics

P T Sarvajani College of Science

City: Surat | Country: India | Website: <https://ptscollege.ac.in/academic/mathematics/> | Final grade: 58%

PUBLICATIONS

[2022]

[Regime Recovery using Implied Volatility in Markov Modulated Market Model](https://onlinelibrary.wiley.com/doi/10.1002/asmb.2719) URL: <https://onlinelibrary.wiley.com/doi/10.1002/asmb.2719>

Goswami Mukherjee Patalwala Sanjay, Applied Stochastic Models in Business & Industry, 38,1127-1143

WORK EXPERIENCE

 **ABH Market Research GmbH – Cologne, Germany**

City: Cologne | Country: Germany

Freelance Telephone Surveyor

[21/08/2022 – 01/10/2025]

Remote project role focused on outbound calls to auto dealers, mechanics, and workshops across Australia, USA, Canada, UK, Republic of Ireland and South Africa. Tasked with gathering information on auto spare parts pricing.

 **Department of Applied Mathematics, The Maharaja Sayajirao University of Baroda. – Vadodara, India**

City: Vadodara | Country: India

Research and Teaching Assistant

[01/07/2018 – 01/10/2018]

Conducted a comprehensive 24-hour course on the Black-Scholes model for second-year MSc Financial Mathematics students

 **Self-employed with Marks Classes as my agent – Pune, India**

City: Pune | Country: India

Mathematics Tutor

[01/06/2018 – 01/10/2018]

Provided personalized one-on-one tutoring in mathematics for International Baccalaureate students at middle and high school levels.

VOLUNTEERING

[01/04/2021 – 01/03/2024] Surat

Middle School to High School Mathematics Tutor

Due the extended COVID lockdowns in my country, lasting almost two years, many students experienced significant learning gaps in language and mathematical skills. I volunteered to tutor a student in math to address the learning gaps caused by the pandemic. Sessions were ondemand, varying in frequency, and conducted face-to-face in India and online in Italy.

[01/01/2017 – 01/01/2018] Vadodara

Tutoring and Academic Support Volunteer - MSc Financial Mathematics Program

Actively supported two classmates in comprehensively mastering all the subjects covered in semester 2 and 3 of MSc financial mathematics program by first thoroughly understanding the material myself, followed by providing personalized tutoring to aid their learning process.

Pune

Tutoring and Academic Support Volunteer - Cryptography and Coding Theory

Provided personalized instruction in cryptography to one Iraqi classmate and coding theory to another during my MSc in mathematics program, by first thoroughly understanding the material myself.

LANGUAGE SKILLS

Mother tongue(s): English | Gujarati

Other language(s):

Hindi

LISTENING C1 READING B2 WRITING B1

SPOKEN PRODUCTION C1 SPOKEN INTERACTION C1

Italian

LISTENING A1 READING B1 WRITING A1

SPOKEN PRODUCTION A1 SPOKEN INTERACTION A1

Levels: A1 and A2: Basic user; B1 and B2: Independent user; C1 and C2: Proficient user

PERSONAL SKILLS

Job-related Skills

- Programming
- Customer Service
- Research and Analytical Skills
- Teaching Mathematics
- Data Analytics
- Data Science

HOBBIES AND INTERESTS

History, astrology/ numerology, astrological history, functional nutrition and health, gut microbiome research, geopolitics, documentaries, music, movies, etc.