# DYUTIDEEPTA BANERJEE

## Deep Tech Professional

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## SUMMARY

Deep Tech professional with a strong foundation in Physics, specialising in image & data interpretation, science-based modelling and advanced analytics. Passionate about creating innovative industrial solutions across sectors, including spacetech, defence, healthcare, robotics, automotive, new energy and material sciences. I combine deep scientific insight and Physics fundamentals with cutting-edge AI, vision & quantum technologies to solve complex, real-world challenges. As a clear communicator, I bring experience in engaging stakeholders across industry & academia - presenting internationally, driving cross-domain discussions, automating workflows, and delivering impactful work to local and global clients.

## EXPERIENCE

**Physics & Data Science Project Associate**
Spatialty.AI
09/2025 - Present | Bangalore, India

- Contributing to R&D in Physics-based modeling, AI, and computer vision for projects across defence, aerospace, construction, energy, and material science.
- Developing foundational models and solutions tailored to the company's interdisciplinary project needs.

**Cross-Platform Solutions Specialist - Contractor**
Johnson & Johnson
06/2024 - 08/2025 | Bangalore, India

- Collaborated with global stakeholders to define business solutions, conduct cross-platform quality checks, and deliver actionable improvements for the product lookup system.
- Managed sprint cycles with international teams across time zones, streamlining agile processes to reduce fix turnaround by 40%.

**Artificial Intelligence Research Intern** *Ongoing Project Link*
MathWorks: Customer Success Engineering Group
11/2022 - 05/2023 | Munich, Germany

- Established a standardised pipeline for multispectral and Digital Terrain Model satellite imagery to enable morphological analysis.
- Developed a MATLAB AI application for spectral image preprocessing, creating gold-standard training data through segmentation, enhancement, and annotation.
- Adapted CNN models with deep and transfer learning, achieving over 95% prediction accuracy.
- Collaborated with international teams at Max Planck Institute and University of Padova, enabling cross-domain applications in geospatial, medical, and manufacturing sectors.
- Continuing research collaboration for publication.

**Visiting Fellow**
International Center for Theoretical Sciences Tata Institute of Fundamental Research
07/2019 - 04/2020 | Bangalore, India

- Developed Physics-based simulation models for turbulent flows in Newtonian fluid dynamics systems for Reynolds' number limits
- Established an experimental mechanism for validating drag models and conducted motion analysis using videographic data
- Designed gcodes and 3D printed lab apparatus for experiments

**Automation Specialist - Freelance**
Toriox PRJ Packaging Pvt Ltd
09/2024 - 12/2024 | Bangalore, India

- Designed and deployed edge-based Python modules for real-time inventory management, reducing manual intervention by 80% in low-latency production environments.

## EDUCATION

**MSc Physics of Data**
University of Padua
10/2020 - 04/2024 | Padua, Italy
(2022/23 foreign exchange - university pause)

**BSc (Hons) Physics, minor in Data Science**
Azim Premji University
08/2016 - 08/2019 | Bangalore, India

## KEY ACHIEVEMENTS

**Winner of ERODEM Research Grant 2024**
Italian Ministry's funding for conservation of heritage sites by carbon dating using ML models

**Winner of Erasmus + Traineeship Grant 2022**

**Poster Publication at 11th European Lunar Symposium 2023** *View Poster*
AI-based detection of Lunar Sinuous rilles: A comparison with manual detection methods

**First-authored Manuscript under review by Elsevier's International Journal of Applied Earth Observation and Geoinformation**
Focused on modular vision pipelines for multi-dataset analysis in Lunar data. Co-authored by Max Planck Institute, University of Padua & MathWorks.

## CERTIFICATIONS

**Finance for Non-finance Professionals** 2025
Rice University by Coursera *Certificate*

**Deep Learning Onramp** 2023
MathWorks *Certificate*

**Introduction to Cosmology** 2017
M. P. Birla Institute of Fundamental Research

**Programming with Python** 2017
University of Michigan by Coursera *Certificate*

**R for Data Science** 2016
Miscrosoft by edX *Certificate*

## INVITED SPEAKER

**Seminar Speaker for the Applicability of AI in Planetary Feature Detections**
**Max Planck Institute for Solar System Research**
05/2023 Göttingen, Germany

**Scientific Ehibitor for Buffon's Mathematical Model**
**Indian Institute of Science**
02/2020 Bangalore, India

## SELECT TECHNICAL CONTRIBUTIONS

**Encrypted QR generator with Decryption Algorithm** ***Project Link***

Built an open source project, a Python-based toolkit for encrypted QR code generation with data created with Tkinter GUI, enhancing data security with Fernet-based decryption system.

**Built an AI-Powered Ed-tech Platform for NASA Space Apps Hackathon 2024** ***View Platform***

Created automated data pipelines for acquiring NASA exoplanetary datasets
Deployed NLP/LLM modules like Llama for improved data processing and tailored course material based on user feedback

**Studied Bristle Bots as a minimal model of directed motion**

Designed & developed 3D printed miniaturised bots having bristle-like legs for movement, with an electromotive light-sensing circuit. Conducted experimental analysis and validation for the bot's motion exposed to an environmental gradient
Formalised theory for design adept towards directed motion to initialise study for collective dynamic systems

## VOLUNTEERING & LEADERSHIP

**Academic Coach for graduate-level Physics & Mathematics**
**Classgap by GoStudent**
01/2024 - 12/2024 Global

**Communication Coach**
**Center for Linguistics, University of Padua**
12/2021 - 12/2022 Padua, Italy

**Certified Peer Counsellor for Mental Wellness**
**Azim Premji University**
07/2017 - 04/2019 Bangalore, India

**Special-ed Teacher Volunteer for the underprivileged at an NGO**
**Parikrma Humanity Foundation**
07/2017 - 12/2017 Bangalore, India

## SKILLS

**Physics & Computational Modelling**
Strong foundation in Physical sciences with expertise in AI for simulations, algorithm development and image analysis

**AI & Data Science**
Proficient in Deep Learning Frameworks, Predictive Analytics, Data Wrangling, Data processing, Statistical Analysis, Data interpretation, Computer Vision, Model Deployment, Scripting, Automation, Technical Documentation and Quality Analysis

**Programming & Tools**
Skilled in Python, MATLAB, R, TeX, CAD, QGIS, SQL, MS Office, Git, Bash, Jira, learning C++

**Soft Skills**
Excellent communication, public speaking, presentation and team leadership skills, financial and business acumen

## LANGUAGES

**English**
Native

**Hindi**
Native

**Bengali**
Mother Tongue

**Italian**
Beginner

**German**
Beginner