Mayukh Abhigyan Das

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Examination	University	Institute	Year	CPI / %
Graduation	IIT Bombay	IIT Bombay (Aerospace Engineering)	2026	7.85
Intermediate	AHSEC	SALT BROOK ACADEMY	2022	84.60%
Matriculation	SEBA	BRAHMAPUTRA JATIYA VIDYALAYA	2020	88.00%

Scholastic Achievements

- Successfully qualified **JEE Main** and **JEE Advanced** out of **1 million** candidates [2022]
- Secured a percentile of **98.94** in Mathematics in the **CUET** out of **0.9 million** students [2022]
- Successfully qualified the **Indian Olympiad Qualifier in Mathematics** (IOQM), a nationally recognized mathematics competition conducted by MTA and HBCSE [2021]
- Eligible for **INSPIRE** Scholarship for being in the top 1 percentile in Class XII Board Examination [2022]

Key Projects

Navigating the Waters of AI (May'23 - Aug'23)

Seasons of Code | Web and Coding Club, IIT Bombay

- Applied preprocessing techniques such as feature engineering, cleaning and encoding to enhance quality
- Implemented various **regression**, **classification** and **clustering algorithms** and studied their background
- Gained insight into concepts of **gradient descent, backpropagation** and their applications to networks
- Worked on the GTSRB dataset achieving **80%** accuracy, and built a **NLP** QnA model based on the **tf-idf** concept

iNotebook [Link] [Jun'24-Jul'24]

Self Project | MERN Stack Development Project

- Developed a **full-stack** note-taking application using **javascript** and **Bootstrap** for a responsive interface
- Created a secure authentication system using **Node.js** and **Express.js**, **MongoDB** for data storage
- Combined **JWT tokens** to manage user sessions securely, ensuring data confidentiality and integrity
- Integrated **context API** in React for efficient global **state management** across components, significantly enhancing performance, flexibility, scalability, and maintainability of the application architecture
- Ensured seamless user experience with secure **sign-in**, sessions and personalized note management

Node-Rest-Shop [Jun'24]

Self Project | Backend Development Project

- Developed a backend shopping application using **Node.js, Express.js, MongoDB, and RESTful APIs**
- Enhanced **security** measures by implementing **bcrypt** for password **hashing** and secure data storage
- Utilized **JWT tokens** for efficient and secure user **authentication**, **authorization**, and validation
- Used **MongoDB** for efficient, scalable, and reliable **database management**, enabling the application to support dynamic and complex data requirements while ensuring high performance and data integrity

Thin-Airfoil Theory Analysis and Custom Airfoil Design [Mar'24]

Course Project | Course: Low Speed Aerodynamics

Prof. Dhwanil Shukla

- Developed a **Python** program for thin-airfoil theory, including generating and plotting camber lines
- **Calculated lift coefficients** (Cl) vs **angle of attack** (α) and compared results with CFD simulations
- Visualized **vector fields** and computed **circulation** using line integrals around simulated airfoils efficiently

- Designed and analyzed **custom airfoils**, integrating functionalities for comprehensive analysis

Aerodynamic Design and Analysis of a Glider Using OpenVSP [Apr'24]

Course Project | Course: Low Speed Aerodynamics

Prof. Dhwanil Shukla

- Utilized **OpenVSP**, to conduct comprehensive aerodynamic simulations for the glider design and developed a weight estimation tool using **Python**, which calculates the weight based on the dimensions and material
- Designed and analyzed wing performance using **lifting line theory** and **empirical methods** extensively
- Created **CAD model** and analyzed parts, estimating **lift and drag** with OpenVSP and empirical methods
- Assembled glider components, conducted comprehensive aerodynamic analysis, and verified performance

Depron Glider [Sep'23]

Course Project | Course: Introduction to Aerodynamics and Propulsion Laboratory

Prof. Dhwanil Shukla and Prof. Prabhu Ramachandran

- Designed a glider using **depron** sheets, masking tape in such a way to **maximise its range**
- Calculated its **Lift to Drag Ratio** and plotted the values by changing elevation angle and speed
- Conducted flight testing to validate glider performance including endurance, stability and **glide ratio**
- Implemented improvements based on flight test data to enhance **aerodynamic efficiency** and performance

TextUtils-React [May'24]

Self Project | Frontend Development Project

- Developed a **React.js** website for text operations like converting **lowercase** to **uppercase** and vice versa
- Enabled comprehensive text analysis, providing **word** and **character** counts and support for **dark mode**
- Designed a **responsive interface** with **Bootstrap** for seamless navigation across various devices

Technical Skills

- **Programming Languages:** Python, C++, MATLAB, HTML, CSS, JavaScirpt, Bootstrap, LaTeX
- **Softwares and Framworks:** Jupyter, Postman, Ansys, Git, React.js, Node.js, Express.js, OpenVSP
- **Python Libraries:** Numpy, Matplotlib, Pandas, PyTorch, scikit-learn, seaborn
- **Database:** MongoDB, MySQL

Key Courses Undertaken

Aerospace Engineering	Introduction to Aerospace Engineering, Thermodynamics and Propulsion, Solid Mechanics, Control Theory, Aerospace Structural Mechanics, Low speed Aerodynamics, AI and Data Science, Adaptive Control System
Math, Physics and Chemistry	Calculus-I, Caulculus-II, Linear Algebra, Differential Equations, Physical Chemistry, Quantum Physics, Classical Mechanics, Organic and Inorganic Chemistry
Lab Courses	Control Systems Lab, Aircraft Structures Lab, Aerospace Structures and Control Lab, Aerodynamics and Propulsion Lab
Miscellaneous	Makerspace, Computer Programming and Utilization, Biology, Economics, Philosophy, Management, Design Thinking for Innovation

Online Courses and Certifications

- The Complete 2024 Web Development Bootcamp by Dr. Angela Yu | UDEMY
- The Complete 2024 Javascipt Course by Jonas Schmedtmann | UDEMY

Extra-Curricular Activities

- Represented Assam in the **National Chess Championship** and have a **FIDE** rating of 1271 [Aug'17]
- Completed a year long training in **Chess** under **National Sports Organization** [2022-23]
- Completed **Prathama** in Classical Music under **Bhatkhande Sangeet Mahavidyalaya** [2012-16]
- Participated in the **Tata Steel Essay** Competition in the Assamese language category [2020]
- Represented Hostel 5 in the 2D Core Fine Arts **GC (General Championship)** [Sep'23]
- Successfully completed "Harichandragarh" trek organised by IIT BOMBAY NCC [Sep'24]