Mridul Gupta

in @emgixiii   ☐ emgi13   🌐 emgi.co.in   ✉ emgi@live.in

🏠 K5, Kasliwal Vishwa
Ulka Nagari, Garkheda
Aurangabad, Maharashtra
India - 431005
📞 (+91) 776 782 5577

EDUCATION

🎓 **BS-MS Dual Degree** (Aug'18-Jul'23)
IISER, Kolkata
West Bengal, India
CGPA - 8.29

🏫 **12th Grade** (Feb'18)
Deogiri College, Aurangabad
Maharashtra, India
Grade - A (77.69%)

🏫 **10th Grade** (May'16)
Nath Valley School, Aurangabad
Maharashtra, India
CGPA - 9.2

CERTIFICATIONS

❋ Driven Astronomy (Jul'19)
❋ Data Analysis with Python (Feb'19)
❋ Microsoft Excel Specialist (Oct'16)

NOTABLE ACHIEVEMENTS

⚲ **Fellowship** (Aug'18-May'23)
Kishore Vaigyanik Protsahan Yojana (KVPY)

⚲ **Qualified IIT-JEE** (May'18)
Ranked 8750

⚲ **Finalist, National Round** (Mar'18)
Indian National Astronomy Olympiad
HBCSE, Mumbai

⚲ **Finalist, National Round** (May'16)
Microsoft Office Championships
New Delhi

WORK EXPERIENCE

💼 **Research Engineer**   Tata Consultancy Services, Mumbai   (Jul'23 - Aug'24)
- Mastered frontend development technologies, enhancing overall project efficiency and team productivity
- Developed AI applications that expedited the frontend development process, reducing visual design implementation and API integration development time by 80%
- Proposed and implemented an information retrieval system that employed fuzzy searching and natural language processing, improving accuracy by 25%
- Conducted training sessions for frontend developers, driving the adoption of TypeScript for type-safe coding practices, reducing development time by 20%
- Designed and implemented data visualizations that grouped and analyzed data by key metrics, facilitating informed decision-making

🖳 **Teaching Assistant**   Indian Institute of Science Education and Research, Kolkata
Programming and Data Structures (CS3101) (Autumn '22)
Introduction to Computation (CS2201) (Spring '21)
- Led instructional sessions for a cohort of 80+ students, graded assignments and tests, conducted tutorials and practicals
- Identified students limited by the course material, challenged the students with advanced problem sets, fostering deeper engagement
- Recommended personal project development to students, enhancing grasp of realistic software development processes
- Guided struggling students by identifying gaps in foundational knowledge, resulting in improved academic performance
- Clarified misunderstandings through practical examples, strengthening students' comprehension and retention of course material

PROJECTS

✦ **Semiprime Factorization using AQC (Master's Project)**
Cryptography, Adiabatic Quantum Computing (AQC), Quantum Annealing, Boolean Satisfiability Problem (B-SAT), Optimization

✦ **Conway's Game of Life Simulation and Reversal**
Emergent Behavior, Cellular Automata, NP-Complete Problems, Probabilistic Solver

✦ **Atomic-level Defect Detection**
Image Processing, Voronoi Tesselation, Delaunay Triangulation, Dynamical Systems, Numerical Methods

✦ **Quantum Harmonic Oscillator Simulation**
Quantum Mechanics, Discrete Fast Fourier Transform (DFFT), Time-Dependent Schrodinger Equation (TDSE), Visualization

✦ **Boid Flocking**
Biophysical Modeling, Emergent Behavior, Global Properties Analysis, Visualization

✦ **CoDi Brain Growth Model**
Spiking Neural Network (SNN), Randomized Cellular Automata, Network Dynamics, Biological Modeling

✦ **Turing Patterns**
Reaction-Diffusion Systems, Animal Coat Patterns, Morphogenesis, Spatial Patterns, Dynamical Systems

✦ **4x4 Sudoku Solver using AQC**
Adiabatic Quantum Computing, Quantum Annealing, Boolean Satisfiability Problem (B-SAT), Quantum Information Processing

✦ **Brainf*ck Interpreter**
Turing Machine, Esoteric Programming Language, Interpretor Design

✦ **Implosion**
Monte Carlo Simulation, Gene Mutation, Cell Culture / Colony Growth Modeling

✦ **Landscape Generation**
Generative Art, Perlin Noise, Procedural Generation

Additional details are available on the blog

SKILLS

- **Programming Languages**: Python, TypeScript, Rust, C/C++, Julia, HTML/CSS, Bash
- **Python Libraries**: Matplotlib, NumPy, SciPy, Numba, Qiskit
- **Frontend Frameworks**: React, AstroJS, SASS
- **Tools & Technologies**: Linux, LaTeX, FFmpeg, Blender
- **Languages**: English, Hindi