Mridul Gupta

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CAREER OBJECTIVE

I am a dedicated physics graduate with a strong foundation in quantum computation, particularly in adiabatic quantum computation. My master's project explored the conversion of prime factorization into a B-SAT problem. I am now eager to delve into algorithms for solving SAT problems, both quantum and classical, as part of my PhD studies.

EDUCATION

BS-MS Dual Degree (Aug '18 - Jul '23)
Indian Institute of Science Education and Research, 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

WORK EXPERIENCE

Research Engineer (Jul '23 - Aug '24)
Frontend Development | AI | Natural Language Processing | IR
Tata Consultancy Services, Mumbai
Maharashtra, India

Teaching Assistant (Autumn '22)
Programming and Data Structures (CS3101)
Indian Institute of Science Education and Research, Kolkata
West Bengal, India

Teaching Assistant (Spring '21)
Introduction to Computation (CS2201)
Indian Institute of Science Education and Research, Kolkata
West Bengal, India

PROJECTS

- **Semiprime Factorization using AQC (Master's Project)**
  Cryptography | Adiabatic Quantum Computing | Quantum Annealing | Boolean Satisfiability Problem (BSAT) | 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
- **Quantum Harmonic Oscillator Simulation**
  Discrete Fast Fourier Transform | Time-Dependent Schrödinger Equation | Visualization | Numerical Methods
- **Boid Flocking**
  Biophysical Modeling | Emergent Behavior | Global Properties Analysis | Visualization
- **CoDi Brain Growth Model**
  Spiking Neural Networks | 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 (BSAT) | Optimization
- **Brainf*ck Interpreter**
  Turing Machine | Esoteric Programming Language
- **Implosion**
  Monte Carlo Simulation | Gene Mutation | Cell Culture / Colony Growth Modeling
- **Landscape Generation**
  Generative Art | Perlin Noise | Procedural Generation

More details can be found on my personal blog.

SKILLS

- **Programming Languages**
  Python | TypeScript | Rust | C/C++ | Julia | HTML/CSS | Bash
- **Python Libraries**
  Matplotlib | NumPy | SciPy | Numba
- **Frontend Frameworks**
  React | AstroJS | SASS
- **Tools & Technologies**
  Linux | LaTeX | FFmpeg | Blender
- **Soft Skills**
  Problem Solving | Adaptability | Critical Thinking | Communication | Teamwork
- **Languages**
  English | Hindi

NOTABLE ACHIEVEMENTS

- Kishore Vaigyanik Protsahan Yojana (KVPY) Fellowship
- Finalist, National Round, Indian National Astronomy Olympiad (HBCSE, Mumbai)
- Finalist, National Round, Microsoft Office Championships, New Delhi
- IIT-JEE 2018: Ranked 8750

CERTIFICATIONS

- Data Driven Astronomy (Jul '19)
- Data Analysis with Python (Feb '19)
- Microsoft Excel 2010 Specialist