HRISHIKESH BELAGALI

Undergraduate Student

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SUMMARY

Undergraduate CS and Math double major interested in high performance computing, Monte Carlo methods, Quantum Algorithms and other optimization techniques

SKILLS

Languages: Python, LaTeX, JavaScript, C++

Packages: NumPy, PyTorch, MatPlotLib

Softwares: LAMMPS, OVITO, pyMOL

EDUCATION

2022 - 2024	**High School Diploma** Secured 4th rank in graduating class Awarded Best in Scientific Temper	**Sri Kumarans Children's Home**
2024 -	**Computer Science (B.S)** Enrolled full time Current GPA: 4.0	**Michigan State University**
2024 -	**Mathematics Advanced (B.S.)** Enrolled full time Current GPA: 4.0	**Michigan State University**

CONFERENCES

2020 *IISc, Bengaluru*	**12th Biennial Lake Conference** Presented a case study on the destruction and conservation efforts of Sarakki Lake Secured 3rd place and awarded Sahyadri Young Ecologist of the Year	

PROJECTS

Python OVITO pyMOL	**Genetic Annealing to Determine Protein Structures** Hybrid genetic annealing algorithm to determine protein structures through the optimization of Irbäck's off-lattice model energy equation (RMSD < 3.0). Use of molecular dynamics to simulate protein folding.	**github.com**
Python	**Helium Ground State Wavefunction Determination** Determination of the ground state wavefunction of Helium and ground state energy using variational quantum Monte Carlo and genetic annealing.	**github.com**
Python	**Adiabatic Quantum Computation** Adiabatic quantum evolution algorithm to determine the ground state of a polarized tranverse Ising model.	**github.com**
Python	**Quadratic Unconstrained Binary Optimization** Stochastic Tunneling-enhanced Simulated Annealing for solving QUBO-type problems.	**github.com**
Python	**Monte Carlo Integration** Monte Carlo integration with importance sampling to numerically evaluate complex integrals.	**github.com**
Python	**Langevin Monte Carlo** Metropolis-adjusted Langevin algorithm for sampling from intractable probability distributions.	**github.com**
Python	**Lattice Grid Optimization** Designed and implemented a simulated annealing algorithm to visualize how cooling schedules affect clustering in a two-color lattice grid.	**github.com**
Python RESTful API	**AP Survey Automation and Analysis** Created a Google Forms API script to generate over 30 AP exam surveys, collecting 1,000+ responses. Led a team to analyze survey data, identifying popular resources for 50,000+ AP students.	**github.com**