

# HRISHIKESH BELAGALI

Undergraduate Student

📍 East Lansing

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

## CONFERENCES

2020 <i>IISc, Bengaluru</i>	<b>12th Biennial Lake Conference</b> Presented a case study on the destruction and conservation efforts of Sarakki Lake Secured 3rd place and awarded Sahyadri Young Ecologist of the Year
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## PROJECTS

Python OVITO pyMOL	<b>Genetic Annealing to Determine Protein Structures</b> 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.	<a href="https://github.com">github.com</a>
Python	<b>Helium Ground State Wavefunction Determination</b> Determination of the ground state wavefunction of Helium and ground state energy using variational quantum Monte Carlo and genetic annealing.	<a href="https://github.com">github.com</a>
Python	<b>Adiabatic Quantum Computation</b> Adiabatic quantum evolution algorithm to determine the ground state of tranverse-field Ising models.	<a href="https://github.com">github.com</a>
Python	<b>Quadratic Unconstrained Binary Optimization</b> Stochastic tunneling-enhanced simulated annealing for solving QUBO-type problems.	<a href="https://github.com">github.com</a>
Python	<b>Monte Carlo Integration</b> Monte Carlo integration with importance sampling to numerically evaluate complex integrals.	<a href="https://github.com">github.com</a>
Python	<b>Langevin Monte Carlo</b> Metropolis-adjusted Langevin algorithm for sampling from intractable probability distributions.	<a href="https://github.com">github.com</a>
Python	<b>Lattice Grid Optimization</b> Designed and implemented a simulated annealing algorithm to visualize how cooling schedules affect clustering in a two-color lattice grid.	<a href="https://github.com">github.com</a>
Python RESTful API	<b>AP Survey Automation and Analysis</b> 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.	<a href="https://github.com">github.com</a>