

Vishal Hariharan

Internship applicant

[LinkedIn](#) | +(1) 470-815-3473 | [GitHub](#)



SUMMARY

Hi there! I'm a Masters student at Georgia Tech in Computational Science and Engineering with research and industry experience in using Machine Learning to glean insights from high dimensional spatio-temporal data. Material Physics was the focus during my undergraduate studies but I eventually discovered my interest in data driven computational methods. My current interests lie in understanding from a mathematical (linear algebra, statistics, topology and optimization) perspective as to how we can design better (stable and robust) algorithms in stochastic multi agent environments. I'm looking for suitable industry experience through which I can learn and grow while contributing to the best of my abilities at the same time. Would appreciate it if we can explore further the potential synergies for this internship opportunity.

EDUCATION

Masters (MS) in Computational Science and Engineering (CSE)

[Aug 2021-May 2023]

Georgia Institute of Technology, USA

- GPA 4.0/4.0, Focus: Statistics and Machine Learning

Interdisciplinary Dual Degree (Bachelors + Masters)

[2016-21]

Indian Institute of Technology (IIT) Madras

- B.Tech in Materials Science (minor in Physics) + M.Tech in Data Science (CGPA: 9.28/10)

RESEARCH PROJECTS

Game theoretic optimization—College of Computing, Georgia Tech

[Jan'22 - May'22]

Competitive mirror descent (CMD), Advisor: [Prof. Florian Schäfer](#), *Computational Science and Engineering*

- Implemented Policy Gradient algorithm to learn optimal strategies for the case of the Iterated Prisoner's dilemma
- Demonstrated the convergence properties of CMD over other algos, in high dimensional stochastic (Markov) games

Masters Thesis—Robert Bosch Centre for Data Science and AI ([Link to report](#))

[Aug'20 - Jul'21]

Physics informed Machine Learning, Guides: [Prof. Phanikumar](#) (D-Materials) & [Prof. Ravindran](#) (D-Computer Science)

- Designed and implemented a Deep Learning pipeline to speed up micro structure simulations in materials by 30X
- Wrote a 2D grain growth simulation code in Python solving Phase Field PDEs to generate video sequence data set
- Trained [E3D-LSTM](#): a convolution integrated RNN, to accelerate the simulations by using future time step predictions
- Introduced inductive bias through graph representation in order to make training scalable from 2D to 3D domain

PROFESSIONAL EXPERIENCE

Graduate Teaching Assistant

[Jan'22 - May'22]

CSE6740, Computational Data Analysis @ Georgia Tech

- Made supplementary video recordings on select topics, graded home works, and answered questions on Piazza

Applied Scientist Intern—Amazon Inc, Bangalore, India

[Feb'21-Apr'21]

Flagging lip sync errors in the wild, Mentor: [Dr. Anil Nelakanti](#), *Digital Video International Tech*

- Implemented a Computer Vision pipeline using Siamese based SyncNet model to quantify dub quality in PrimeVideo
- Trained the lip-sync discriminator on HD data to identify regions of low audio-lip correspondence in dubbed content
- Devised suitable experiments and analysed the results of inference on Amazon studios data across multiple languages

Research Intern—Birck Nanotechnology Center, Purdue University, USA

[May'19-Jul'19]

Strain Tuning of 2D materials, Guide: [Prof. Yong Chen](#), *Department of Physics and Astronomy*

- Conducted experimental studies (MOKE) on the effect of mechanical strain on magnetic properties of 2D materials

COURSE WORK

Georgia Tech

- Computational Science and Engineering Algorithms, Computational Data Analysis (Machine Learning), Linear Statistical Models, Computational Problem Solving, Numerical Linear Algebra, High Performance Computing

IIT Madras

- Linear Algebra and Numerical Analysis, Probability and Statistics, Quantum Physics, Condensed Matter Physics, Numerical Solutions of PDEs, Atomistic Modeling of Materials, Mathematical Foundations of Data Science, Statistical Foundations of Data Science, Data Analytics Lab, Reinforcement Learning, Big Data Laboratory

TECHNICAL SKILLS

- **Programming:** C/C++ (OpenMP, MPI), Python, Julia, FORTRAN
- **Tools and libraries:** Mathematica, Matlab, R, Tensorflow, PyTorch, VASP, Quantum Espresso
- **Computational Frameworks:** Parallel Programming, Finite Element and Volume methods