



PhD Project

Project Details

Project Title

Artificial Intelligence for Accelerating Scientific Discovery

Project Summary

Scientific discoveries form the backbone of the progress of the human societies. Scientific phenomena are generally expressed in mathematical forms using differential equations, which are in turn, solved to learn the behavior of systems. In this project, we aim to develop graph neural network-based advanced machine learning approaches to model differential equations and materials behavior. Specific aspects of the problem include data distillation and graph coarsening for accelerated simulation. Overall, the project aims to develop a robust framework to advance materials modeling through machine learning and physics-based simulations.

PhD Supervisors

Role	Faculty	Academic Unit in IITD	Email ID
Supervisor 1	N M Anoop Krishnan	Civil Engineering	krishnan@iitd.ac.in
Supervisor 2	Sayan Ranu	Computer Science and Engineering	sayanranu@iitd.ac.in

Project requirements (Student qualifications, experience required, etc.)

- B.Tech. with a valid GATE score or M.Tech. in Civil/Mechanical/Electrical/Materials Science/Computer Science or any allied discipline or M.Sc. in physics with CSIR/JRF or MCA or any other equivalent relevant degree.
- Candidates with prior experience in machine learning related projects is preferred.
- Candidates with proficiency in LINUX-based systems and scientific computing (Fortran 2003 / C / Python or Julia) is preferred.

Source of funding (IRD/FITT Project details, if any)

Institute fellowship/ Project fellowship

Role of Faculty Members involved:

N. M. Anoop Krishnan will contribute to the physics-based modeling.

Sayan Ranu will contribute towards the development of machine learning algorithms.