PMRF-ISSS Teaching Programme

Prime Minister Research Fellowship students' teaching requirement
facilitated by the Institute of Smart Structures and Systems

Module PMRF-ISSS007/2025

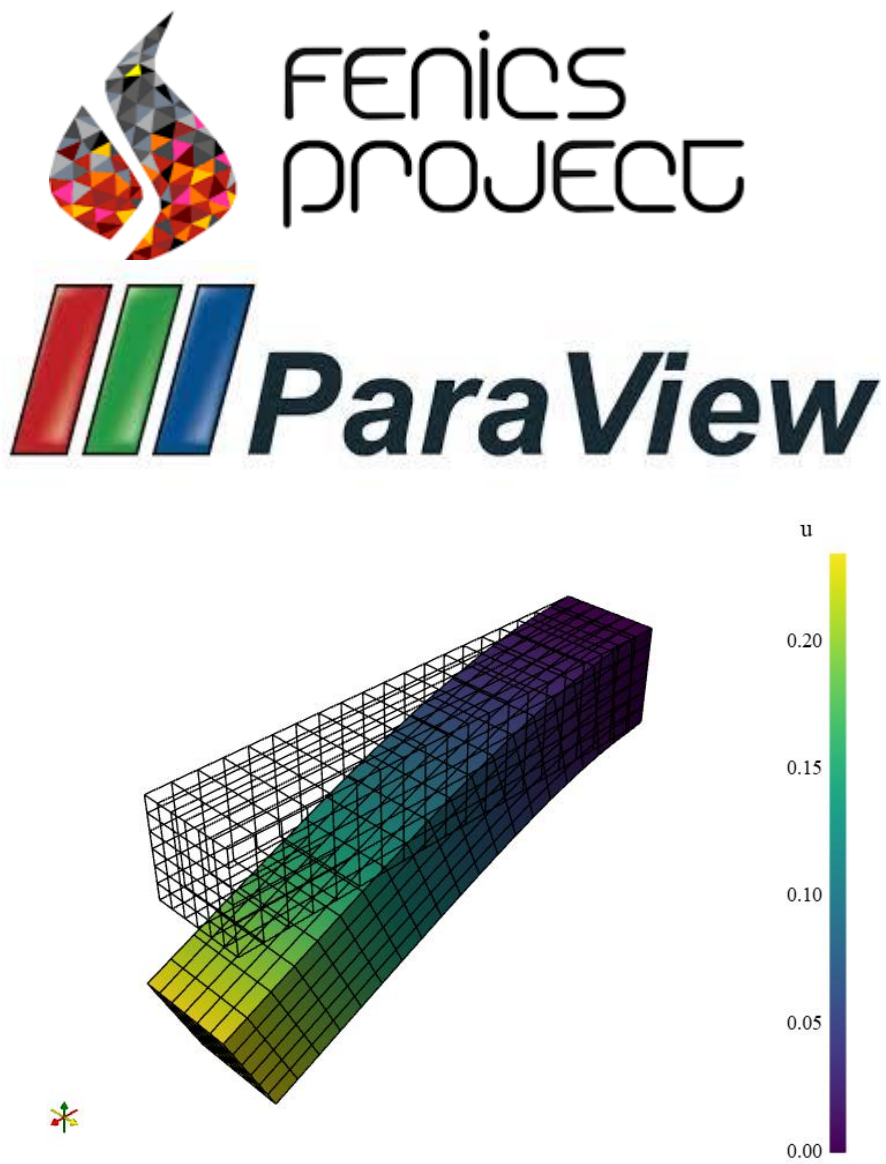
Finite Element Modeling with FEniCS

Name of the PMRF student

Anay Mohan Shembekar

Required background of the students taught

Senior UG/PG students from Civil/Mechanical/Aerospace Engineering



Details of the content of the module

This module introduces the Finite Element Method (FEM) using FinieFEniCS to solve engineering problems. Starting with Partial Differential Equation (PDE) basics and analytical solutions (e.g., heat conduction), it transitions to weak formulations and FEM theory. Students code 1D linear problems (beam bending, steady heat transfer) in FEniCS, then extend to higher dimensional geometries (linear elasticity, heat flow). Transient analysis (time-dependent problems) and error estimation are introduced to refine solutions. Results are visualized using Paraview. By the end, students would be able to bridge theory and practice, solving real-world problems computationally. All tools are open-source, and relevant codes will be shared.

Schedule of the module

The course begins on 3rd February 2025 and will span about 16 hours, spread across 8 lectures. Lectures will be uploaded online at 8PM on Monday, Wednesday and Friday. Participants will be able to access the lectures at their convenience.

Meeting link : Will be shared later

Contact email ID: isss.forum@gmail.com

Registration Link: https://bit.ly/3Ebeav3

QR code: