

I-STEM Software Request - Guide Approval Form

User Details

- Name of Researcher: Niranjana C
- User Type: Ph.D. Scholar
- Institution Name : Dayanand Sagar University
- Institutional Contact No: 080 4909 2924
- Research Topic: Study of control mechanisms involved in solid state manufacturing using conductive Polymers
- Software Request Details
- Software Name: AC/DC Module, Polymer Flow Module, Metal Processing, Heat Transfer Module, Multibody Dynamics, Livelink for Simulink, Material Library

Justification for Software Request: The objective of the research is to model and analyse the ultrasonic welding process with control mechanism for joining conductive polymers used for defence and energy storage application. For joining conductive polymers, the evaluation of polymer flow is essential for the analysis of disturbed flow or structure, mechanical stress and heat dissipation. The key control mechanism for ultrasonic welding relies on precise tuning of amplitude control, pressure, welding time, frequency and feedback design. The usage of COMSOL Modules can facilitate simulation of ultrasonic welding of conductive polymers with integrated control mechanisms. Modules like AC/DC, Heat Transfer, and Polymer Flow can be used for precise regulation of temperature, pressure, and material behavior during bonding. Multibody Dynamics and LiveLink for Simulink can be used in the study of real-time motion control and optimization of input parameters for reliable and efficient manufacturing. The Material Library will help in using accurate property data, enhancing simulation fidelity and joint quality.

Guide/Supervisor Approval

I, Dr. Mukti Chaturvedi,

- Confirm that the above-mentioned researcher is affiliated with our institution
- Have reviewed the software request and its relevance to the researcher's academic work
- Approve the software request for research purposes

Approval Confirmation

- I approve the software request
- The software aligns with the researcher's research objectives
- The request meets the institutional research guidelines

Guide/Supervisor Signature: _____

Date: 07.04.2025

Official Stamp/Seal:

Important Notes

