

I-STEM Software Request - Guide Approval Form

Date: 23/01/2026

User Details

- **Name of Researcher:** Sagar Sarjerao Khot
- **User Type:** ☐ Ph.D. Scholar ☒ Postdoctoral Researcher ☐ Bachelor's ☐ Masters
- **Institution Name:** Shivaji University, Kolhapur, Maharashtra.
- **Institutional Contact No:** 0231-2609490
- **Research Topic:** Development of models for synaptic and memory devices using finite element method.

Software Request Details

- **Software Name:** COMSOL Multiphysics (Basic + Advanced Modules)
- **Justification for Software Request:** My research focuses on finite-element modeling of resistive switching and memristive devices for next-generation memory and neuromorphic computing. During my Ph.D., I extensively used COMSOL Multiphysics to develop physics-based models of interfacial resistive switching governed by Schottky barrier height modulation and oxygen vacancy migration, validated against experimental data. My doctoral dissertation centers on FEM-based simulation frameworks for memory and synaptic devices, requiring accurate modeling of electric fields, ionic transport and interface phenomena. Continued access to COMSOL basic and advanced modules is essential to perform multi-physics simulations involving semiconductor transport, defect migration and electro-thermal coupling in nanoscale devices. This software directly supports optimization of device geometry, material parameters and switching dynamics, reducing experimental trial-and-error and enabling high-impact research outcomes.

Guide/Supervisor Approval

I, Dr. Tukaram D. Dongale,

- 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



Supervisor Signature: Dr. Tukaram D. Dongale

Official Stamp/Seal: Assistant Professor,
School of Nanoscience & Biotechnology
Shivaji University, Kolhapur.

