

Numerical simulation and analysis of a cantilever Timoshenko beam with a tip body

R du Toit
University of Pretoria
u15000258@tuks.co.za

Topic: Partial differential equations, modelling, associated numerical analysis

From simple repetitive tasks on a production line to the assembly of space stations, robotic arms are important contributors to modern development. In its simplest form, a cantilever beam with a tip load can be used to model the first limb of a robotic arm. Using the Mixed Finite Element Method (MFEM), various experiments can be conducted to investigate the behaviour of the model. These experiments include using both rigid and elastic endpoints, changing some of the dynamics of the beam or tip body and varying parameters. For each experiment, the system of ODE's acquired is presented and graphs are obtained that visually describe the motion and behaviour of the model for different parameters.