

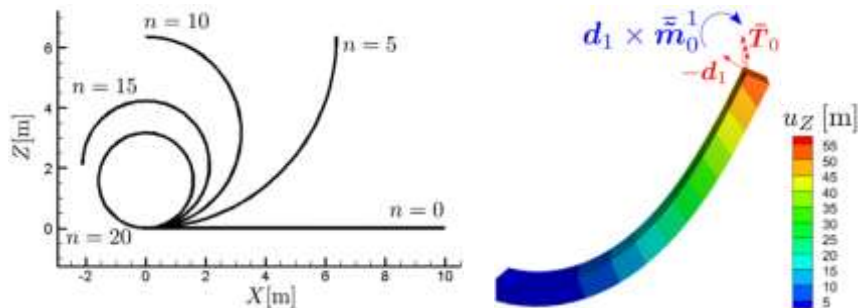
Master Thesis

Alleviation of locking in nonlinear beams with unconstrained directors

Background

It has been shown that the Cosserat rod theory with unconstrained directors enables an efficient description of cross-sectional deformations in slender bodies. In this thesis, we focus on **one of the following topics**:

- Alleviation of transverse shear/membrane locking:
 - Implementation of a *Greville quadrature scheme* and investigation on zero-energy modes and its stabilization
- Alleviation of curvature-thickness locking:
 - Implementation of an *assumed natural strain method*
- Alleviation of Poisson locking:
 - Implementation of an *enhanced assumed strain method* and investigation on its *possible modes of instability*



Aim

- Develop a finite element formulation for an efficient simulation of large deformation in slender rods or rod-like bodies
- Survey relevant literature
- Write your own computer code (reference FORTRAN code provided)
- Learn tools for a scientific visualization/writing

Contact