Chair for Computation in Engineering
Department of Geo, Civil and Environmental Engineering
Technical University of Munich

Modeling: ★★☆☆☆
Mathematics: ★★★☆☆
Programming: ★★★★☆
Science: ★★★☆☆

Software Lab:

Adaptive Plasticity

Setting

For many nonlinear problems the optimal mesh configuration changes continually throughout the deformation process, requiring successive mesh adaption during solution. For problems involving internal variables, accurate data transfer between meshes are essential for accurate computations.

To get familiar with the topic, we will implement a simple 1D plasticity model in an adaptive code, together with simple transfer operators.

http://www.ssanalysis.co.uk/blog/metal-inelasticity-modelling-with-abaqus
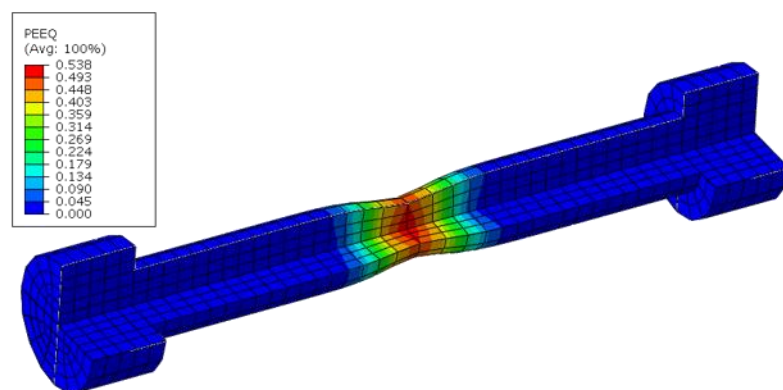
Task

You will be given a simple 1D adaptive matlab code for linear elasticity. Your task consists in extending this code:

- Get familiar with the topic
- Implement a simple small strain elastoplastic model
- Implement and compare simple transfer operators

Supervisors

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References

[1] D. Perić, Ch. Hochard, M. Dutko, D.R.J. Owen, Transfer operators for evolving meshes in small strain elasto-placticity, Computer Methods in Applied Mechanics and Engineering, Volume 137, Issues 3–4, 1996.