Master's Thesis

ROBUST MECHANIZED TUNNELLING SIMULATION WITH INDUSTRIAL SOFTWARE

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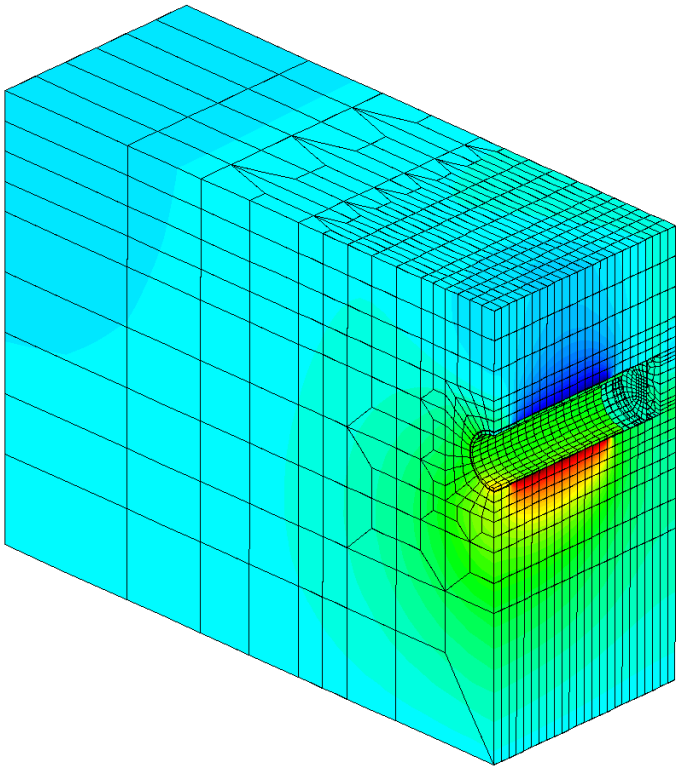
Background:



Due to the necessity to have a benchmark model of the numerical mechanized tunnel model based on advanced numerical techniques, we need to re-implement the full tunnel model using boundary-fitted mesh into commercial software to take advantage of the robust solution procedures. The tunnel model should at least comprise a multiphase element formulation for saturated soils and a time-dependent grouted material. Other than that, the existing components in the commercial software shall be sufficient for modelling. We aim to perform the re-implementation in Abaqus and Marc-Mentat.

Tasks:

+ The Abaqus-compatible mesh is provided. The student shall visually check the correctness of element assignment and layer in the software.

+ Assign the correct element type and material, implement a staged-construction procedure in the software.

+ Assign the contact between the Tunnel Boring Machine and the soil

+ Run the simulation and extract the monitoring data on the surface and tunnel rings.