MSc graduation project: Parallel GPU solver for PLAXIS

PLAXIS is finite element software for civil engineering applications involving the non-linear mechanical behaviour of soils and rocks. The finite element calculations involve the solution of large systems of equations. PLAXIS is part of Bentley Systems, a leading global software company for infrastructural projects.
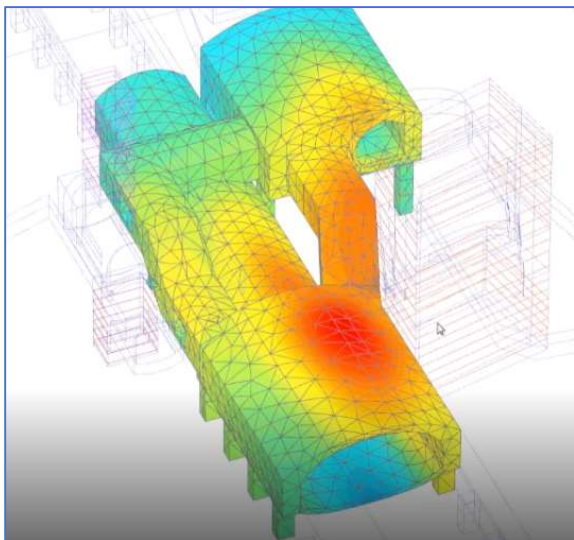
A previous collaboration project between PLAXIS and the Numerical Analysis group at TUDelft resulted in a new dedicated parallel iterative solver PICOS, which takes advantage of the underlying physics when decomposing the system into sub-domains.

In a new MSc graduation project, we want to investigate and take advantage of recent developments in GPU computations, to further enhance the performance of the PLAXIS finite element calculations. Besides the use of GPUs in the solution of the systems of equations, the student who works on this project is also challenged to investigate the possible use of GPUs in other parts of the kernel, such as the matrix assembly, the stress calculations and other relatively time-consuming parts of the non-linear calculation process.

Performing your MSc graduation project at the PLAXIS office in Delft means:

- Working in a stimulating multi-cultural research-oriented environment
- Working on high-tech software solutions that are used world-wide in prestigious engineering projects
- Getting excellent supervision from experienced research engineers
- Obtaining a monthly financial compensation

For more details, please contact Prof. Kees Vuik, TUDelft, Numerical Analysis group (c.vuik@tudelft.nl) or Dr. Ronald Brinkgreve, PLAXIS (ronald.brinkgreve@bentley.com).