

1. Numerical analysis of cracks in elastic bodies with modified versions of the Finite Element Method (Dr. Legatiuk)

Fracture mechanics is one of the most important fields in civil engineering, since cracks have a direct influence on sustainability and serviceability of structures. Therefore, it is necessary to perform advanced crack modelling. In this project, we would like to compare existing FEM-based numerical methods for crack modelling with a novel recently developed numerical method, which is based on the coupling of analytical and FEM solutions. The work in the project will enforce advanced knowledge about the FEM and related topics, particularly, topics related to mesh generation, error analysis, computer implementation of the FEM will be addressed in detail.