

Vacancy on computational geomechanics at BAW (Germany)

About the position: vacancy for a **3-year R&D project** within **computational geomechanics** at **BAW Bundesanstalt für Wasserbau Federal Waterways Engineering and Research Institute Department of Geotechnical Engineering in Karlsruhe, Germany**. The R&D-position's main objective is to improve open source geomechanical analysis tools and to qualify the candidate for research positions.

Duties of the position: The R&D project aims at the validation and further development of poroMechanicalFoam, an openFOAM based FVM-model for hydro-mechanical analysis of flow-structure-soil interactions considering variable soil saturation. Based on analytical solutions and experimental data the impact of spatial and temporal discretization on robustness and accuracy shall be determined. The model performance shall be tested based on case studies from the geotechnical engineering practice at BAW considering representative aspects among others anisotropy of the mechanic and/or hydraulic properties, advanced soil material models (bounding surface plasticity), variable saturation and gas entrapment below the phreatic surface. In the final stage predictable failure mechanisms are to be addressed within the framework of the second order work concept. If desired, there is possibility for laboratory tests for characterization of soil properties and or/identification of aspects yet not properly captured in poroMechanicalFoam.

Required selection criteria: The qualification requirement is a completed a master's degree or second degree (equivalent to 120 credits) with a strong academic background in engineering/physics or closely related discipline.

Preferred selection criteria: It is advantageous if the candidate:

- Has a solid knowledge of the theory of finite element or finite volume method.
- Has previous knowledge of poromechanics.
- Has hands-on experience with software packages, e.g., ABAQUS, ANSYS, openFOAM.
- Is familiar with software development principles like object-oriented programming (C++).
- Excellent communication skills.
- Is willing to learn German language.

For further information please contact: Dr.-Ing. Héctor Montenegro

hector.montenegro@baw.de or M. Sc. Denis Maier denis.maier@baw.de