PhD Student in Computational Soil Mechanics

Faculty/department Civil Engineering and Geosciences
Level Master degree
Maximum employment 38-40 hours per week (1 FTE)
Duration of contract 4 years
Salary scale €2395 to €3061 per month gross

Job description

Applications are invited for a PhD student to be based within the Section of Geo-Engineering, to work on the development, implementation and application of a multiscale modelling tool as a numerical testing environment for geomaterials.

The first objective of this project is to develop and implement a numerical environment for studying the behaviour of heterogeneous geomaterials in an existing finite element code. Based on the explicit modelling of fine-scale heterogeneities and discrete micromechanical structure, the homogenized, large-scale constitutive behaviour is to be derived. This homogenized response of heterogeneous soils has to provide input for the formulation of constitutive relations.

Complementary to experimental element testing, the application of the numerical testing environment will allow efficient and rigorous studies of the effects of heterogeneity and microstructure on the (multi-physics) behaviour of soils. In combination with stochastic modelling, this approach will be used to formulate and calibrate stochastic material models. These models account for the small-scale heterogeneous nature of soils as well as for the associated uncertainties and will form the input for stochastic numerical models for the reliability-based design and assessment of geotechnical structures.

Requirements

Applicants should possess a very good first degree in Civil Engineering, Geoscience, Mechanics of Materials or other related discipline. A good understanding of continuum mechanics and numerical modelling is essential, as well as an aptitude for scientific programming for the implementation of numerical methods in existing and new finite element codes. Communication skills are important, and applicants should have a high level of proficiency in written and spoken English. The successful candidate will be expected to cooperate with other members of the research team and external collaborators.

Conditions of employment

TU Delft offers PhD-candidates a 4-year contract, with an official go/no go progress assessment after one year. Salary and benefits are in accordance with the Collective Labour Agreement for Dutch Universities, increasing from € 2395 per month in the first year to € 3061 in the fourth year. As a PhD candidate you will be enrolled in the TU Delft Graduate School. The TU Delft Graduate School provides an inspiring research environment with an excellent team of supervisors, academic staff and a mentor. The Doctoral Education Programme is aimed at developing your transferable, discipline-related and research skills.

The TU Delft offers a customisable compensation package, discounts on health insurance and sport memberships, and a monthly work costs contribution. Flexible work schedules can be arranged. For international applicants we offer the Coming to Delft Service and Partner Career Advice to assist you with your relocation.

Faculty Civil Engineering and Geosciences

The Department of Geoscience and Engineering resides within the Faculty of Civil Engineering and Geosciences, and encompasses 5 sections: Applied Geology; Applied Petrophysics and Geophysics; Geo-Engineering; Resource Engineering; and Reservoir Engineering. Current collaborations between Geo-Engineering and the wider Faculty include the Section of Offshore Engineering, and the Departments of Structural Engineering, Hydraulic Engineering, and Geoscience and Remote Sensing.

The Section of Geo-Engineering has 12 full-time and 6 part-time academic staff, and ~40 PhD and Post-Doctoral researchers. Areas of expertise include soil mechanics, dykes and embankments, foundation engineering, underground space technology, engineering geology, and geo-environmental engineering. There are extensive experimental laboratory facilities, including large-scale soil-structure interaction testing facilities and a geotechnical centrifuge, as well as excellent computing facilities including access to national High Performance Computing networks.

Additional information

For more information about the position and for informal discussion please contact Dr. Bram van den Eijnden, +31 (0) 15 278 7443, a.p.vandeneijnden@tudelft.nl.

Application procedure

Are you interested in this vacancy? Please apply before **21 June 2021** via the TU Delft website and upload:

- a detailed CV
- abstract of your MSc thesis (1 page)
- the names and contact details of 2 referees
- along with a letter of application