

Marie-Curie Research Fellow (Post-Doc position)
Software development for modelling soil-fluid interaction with MPM
MPM-DREDGE (PIAP-GA-2012-324522)

Duration : 21 months, starting at 1st November 2013 (or as soon as possible)
Location : Stichting Deltares, Delft, The Netherlands

Introduction

The aim of the project is to develop, validate and demonstrate a numerical tool for the modelling and simulation of dredging applications. It is aimed to solve the numerical issues associated with large deformations and fluid pressures that occur in the interaction between soils and fluids using the Material Point Method (MPM). This effort will result in a joint computer code that combines earlier pioneering work of the participants (University of Cambridge and Stichting Deltares) in the field of soil-fluid interaction.

During the project new methodologies will be developed, the advanced code will be intensively validated using benchmark problems and will be demonstrated for dredging applications. The main focus will be on the modelling of soil-fluid interaction problems related to the following three dredging applications: 1) dropping of geocontainers with interaction between pore water and open water, 2) liquefaction and marine slope slides including the dredging of soils and 3) erosion and scour around offshore and near-shore structures.

Required scientific skills

- strong background in soil mechanics, continuum mechanics and constitutive modelling
- background in soil-structure-fluid interaction
- expertise in (computational) geomechanics: FEM and experience with Material Point Method (MPM)
- experience in software development, programming with Fortran 90 and C++, experience with ParaView
- doctoral degree in the field of Civil Engineering (preferably specialisation in Geotechnical Engineering)

Main activities, tasks and responsibilities

- Development of a joint dynamical MPM code including pre- and post-processing in close collaboration with other researchers of the project which involves major programming work.
- Code maintenance and regular upgrading of the trunk version of the code, which will largely be done on the basis of new developments in the branches together with doctoral students.
- Code validation with benchmark problems and application to problems of practical relevance (dropping of geocontainers, liquefaction and slope slides, erosion and sedimentation).
- Final testing of the trunk version of the code with reference to the applications
- Presentation of the work on the code and applications in regular management meetings, and in more detail in annual workshops.
- The work will be reported in the form of an engineering manual.
- Scientific publications in journal papers and conference proceedings.
- General tasks are the maintenance of website, organisation of (scientific) workshops and training courses and contribution to outreach activities.

What we offer

- 21 months full-time contract (40 hours per week), full social security
- full involvement in EU FP7 IAPP project MPM-DREDGE (PIAP-GA-2012-324522)
- training opportunities and knowledge exchange activities (participation in annual workshops of the project, participation in international conferences)
- working in an vital environment and cooperation with several doctoral students, Post-Docs and researchers at Deltares Delft, University of Cambridge and UPC Barcelona
- monthly gross salary of 3950 Euro (living and mobility allowance) for a single person or monthly gross salary of 4160 Euro for a family.



Conditions for eligibility (EU rules)

To be eligible, the newly recruited researcher must simultaneously fulfil the following criteria at the time of recruitment by the beneficiary home organisation.

- The newly recruited researcher must be an experienced researcher who at the time of recruitment was not a staff member.
- No restrictions on nationality.
- At the time of recruitment the newly recruited researcher must not have resided or carried out his/her main activity in the country of the beneficiary, for more than 12 months in the 3 years immediately prior to his/her recruitment under the project. Compulsory national service and/or short stays such as holidays are not taken into account.

Are you interested?

For more information you can contact:

Alex Rohe (alex.rohe@deltares.nl) or Pieter Vermeer (0031652420739) or Harm Aantjes (0031622932969)

Application

(closing date 15th of September 2013, interview & presentation 1-3 October 2013)

Deltares

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Or send your application to application@deltares.nl.

