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1st International Conference on the Material Point Method, MPM 2017

Editorial MPM 2017 Conference

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Abstract

This volume of the Procedia Engineering series contains the proceedings of the 1st International Conference on the Material Point Method (MPM 2017, Delft, The Netherlands, 10–13 January 2017). Many abstracts were received and, of these, 49 papers were accepted for inclusion in these conference proceedings. Authors presented their work in one of the conference's technical sessions.

Peer-review under responsibility of the organizing committee of the 1 st International Conference on the Material Point Method.

Keywords: material point method; soil-water-structure interaction; large deformation; numerical modelling.

1. Preface

The Anura3D MPM Research Community is delighted to present you the proceedings of the 1st International Conference on the Material Point Method for "Modelling Large Deformation and Soil–Water–Structure Interaction" held in Delft (The Netherlands) on 10–13 January 2017. This is the first conference following a series of international workshops and symposia previously held in Padova (2016), Barcelona (2015), Cambridge (2014) and Delft (2013) within the European Community's Seventh Framework Programme Marie–Curie project MPM–DREDGE (see also Section 3).

The aim of the conference is to provide an international forum for presenting and discussing the latest developments in both the fundamentals and applications of state-of-the-art computational methods that can be effectively used for solving a variety of large deformation problems in geotechnical and hydraulic engineering.

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Special focus is on the numerical modelling of the interaction between soils, water and structures where the interface and state transition between solid and fluid behaviour plays an essential role.

The peer reviewed papers contained in these proceedings have been authored by academics, researchers and practitioners from many countries in Europe and worldwide. The papers cover numerous important aspects related to the numerical modelling of large deformations and soil–water–structure interaction, ranging from the recent mathematical developments of the material point method, across benchmark examples up to real engineering applications.

The editors would like to acknowledge the Scientific and Review Committees for their assistance in the review process. They would also like to thank the authors, participants and sponsors.

On behalf of the Organising Committee, the Anura3D MPM Research Community and the partners of the MPM–DREDGE project, we welcome you to The Netherlands and hope that you find the conference both enjoyable and inspiring.

Alexander Rohe
Kenichi Soga
Hans Teunissen
Bruno Zuada Coelho
January 2017

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3. MPM–DREDGE project

The conference is organised as the final activity of the MPM–DREDGE project on “Modelling and simulation of soil–water interaction for dredging applications using the Material Point Method”. MPM–DREDGE is an Industry–Academia Partnerships and Pathways (IAPP) project funded from the Seventh Framework Programme (FP7/2007-2013) of the European Commission under Grant Agreement PIAP–GA–2012–324522 during 2013–2017. The financial support is greatly acknowledged.

The MPM–DREDGE project aims at developing, validating and demonstrating an advanced software tool based on the material point method for the modelling and simulation of processes related to the dredging and offshore industries. It is addressing the scientific challenges associated with large non-linear deformations, water pressures and phase transition that occur in the interaction between soils and fluids.

4. Anura3D MPM Research Community

The conference is organised by the Anura3D MPM Research Community. This international collaboration brings together the complementary expertise of seven groups carrying out research on numerical modelling of large deformations and soil–water–structure interaction. The Anura3D MPM Research Community is a collaboration of the following partners:

- Geotechnical and Environmental Research Group, Engineering Department, University of Cambridge, United Kingdom, represented by dr Dongfang Liang;
- Soil and Rock Mechanics Research Group, Civil Engineering School, Universitat Politècnica de Catalunya (UPC), Barcelona, Spain, represented by prof Eduardo Alonso;
- Institute of Geotechnical Engineering and Construction Management, Technische Universität Hamburg-Harburg (TUHH), Germany, represented by prof Jürgen Grabe;
- Unit Geo-engineering Deltares, Delft, The Netherlands, represented by Simone van Schijndel;

- Research Group Geotechnics, Department of Civil, Environmental and Architectural Engineering, Università degli Studi di Padova, Italy, represented by prof Paolo Simonini;
- Faculty of Civil Engineering and Geosciences, Delft University of Technology, The Netherlands, represented by prof Wim Uijttewaal;
- GeoSystems (Geoengineering) Group, Civil and Environmental Engineering Department, University of California Berkeley, United States, represented by prof Kenichi Soga.

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