ISSMGE FOUNDATION
REPORT ON CONFERENCE ATTENDANCE

Your Name: AKHILA VASUDEVAN NAMPOOTHIRI	***Your Organization:*** Indian Institute of Technology, Guwahati	***Date of report:*** 3rd July 2023
Conference Title: NUMGE 2023	***Location of Conference:*** Imperial College London, UK	***Dates of Conference:*** 26th -28th June 2023

What you learned:

I am a PhD student working on finite difference method solution to finite strain consolidation problem for slurries such as tailings and dredged clays. The NUMGE 2023 was a conference focused on numerical methods and their applications in Geotechnical Engineering. The conference was enlightening in terms of the varied capabilities of numerical methods such as finite element, discrete element and material point methods, which are advanced and advantageous in comparison to the finite difference method. Lectures were very informative, discussing the application of software such as Plaxis, Abaqus and Geostudio in fields of off-shore geotechnical engineering, energy geotechnics, tunnelling and mining, earthquake engineering, etc. The detailed discussion of variety of case studies from industrial experts helped in developing perspective regarding the application of numerical techniques on field problems related to tailings dam failures, metro and underground railway constructions and safe off-shore foundation design and construction. The applications of ALE (Arbitrary Lagrangian and Eulerian) method and Particle-FEM for finite strain problems such as finite slope failure and cone penetration tests conducted in slurries helped in inspiring me to further explore these methods to understand the capability if application in the area of slurry consolidation.

People you met:

Following are a few amongst many of the enthusiastic and distinguished researchers I met at the NUMGE 2023 conference

1. Dr. David Reid, Research Fellow, School of Engineering, Civil, Environmental and Mining Engineering
2. Dr. Bappaditya Manna, Professor, Department of Civil Engineering, Indian Institute of Technology, Delhi
3. Dr. Phil Vardon, Professor, Energy Geomechanics, TU Delft, Netherlands
4. Dr. Lidija Zdravkovic, Professor, Civil and Environmental Engineering Department, Imperial College -London

Main features of conference:

The main features of the conference include:

- Insightful lectures on advanced numerical techniques such as Finite element method, Material Point Method, Discrete element method, etc

- Application of software-based models in the safe and efficient design and construction of large field projects such as metro and railway tunnels, off shore wind turbine foundations, etc
- Numerical modelling of complicated experimental techniques such as cone penetration tests
- Safety assessment and post failure analysis of large geotechnical structures such as mine tailings storage facilities using numerical methods.
- Back analysis of state parameter properties using software from field or experimental observations

The conference dinner was organised in a cruise boat. The beautiful evening scenery of the Tower bridge, Tower of London Museum, The Shards, etc while cruising around the waters of river Thames, was a new experience.

Your comments on the conference:

NUMGE 2023 was an excellent platform for the researchers from the industry as well as academia to meet and exchange incredible findings in their respective areas, connected strongly by the use of advanced numerical techniques. Attending and presenting my work at this esteemed conference was a wonderful experience for me. The invited lectures on varied areas were intriguing and the presentations were truly inspiring due to the depth and complexity of the projects discussed and the application of advanced numerical methods allowing to make the same much simpler.

Please attach short report (maximum 400 words) suitable for publication in the ISSMGE Bulletin:

The 10th European Conference on Numerical Methods in Geotechnical Engineering (NUMGE 2023) was conducted in the Imperial College, London from 26th -28th June 2023. It is a part of the conference series organised by European Regional Technical Committee 7 for Numerical Methods with the support of ISSMGE foundation. It was an incredible opportunity to interact with like-minded researchers as the conference happens only once in four years. The key-note lecture was given by Dr. Lidija Zdravkovic, and Dr. Helmut Schweiger. The conference was organised as a part of the Scott Sloan Memorial programme. The event started off with a theme lecture on numerical modelling used in the area of offshore geotechnical engineering, in which the speaker Dr. Susan Gourvenec presented the used of finite element modelling in off-shore constructions. Most of the papers presented in the conference used platforms such as Plaxis, Geostudio, ABAQUS, and other finite element-based software for various analysis. Few of the note-worthy presentations are being discussed in this highlight. One of the interesting presentation on tailings dam failures was the numerical assessment of drilling induced static liquefaction triggering of Feijao Dam which used finite element modelling to reanalyse the liquefaction triggering process to assess whether drilling works, at two sections, could trigger liquefaction first in the immediate area around the borehole by leading to an increase in pore water pressure around the drill hole and then whether this would be sufficient to lead to flow liquefaction of the entire structure. The Arbitrary Lagrangean Eulerian method was observed to be used by a number of papers presented in the conference for incorporating mesh deformations and accommodating large deformations specially when dealing with mine tailings. Anton Pillai from ARUP gave an enlightening theme lecture wherein he discussed three case studies. The idea being, it does not improve accuracy if the key complexities are not well understood when modelling using

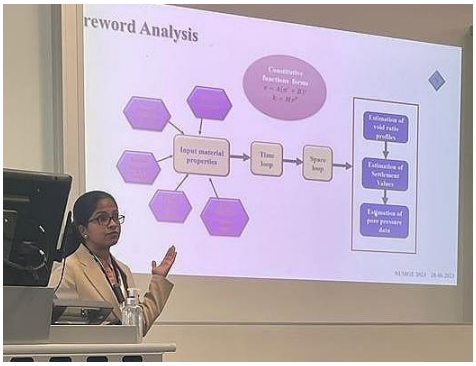
finite element method. An intriguing work presented in the area of tunnelling discussed the influence of building constructions on existing tunnels in terms of their horizontal and vertical displacements for constructions in Delhi region, India, using PLAXIS 3D.

The NUMGE 2023 was a true confluence of industrial and academic ideas. The experience has helped widen my intellectual horizons in the area of advanced numerical techniques and their applications in the field of geotechnical engineering. I whole heartedly thank the ISSMGE foundation for supporting me in attending this conference.

Photographs from Conference:

Me with Dr. Reid, Research Fellow at the University of Western Australia

A photo with Dr. Bappaditya Manna, Professor at IIT Delhi, and a few research scholars from India



My presentation

Me at the conference dinner