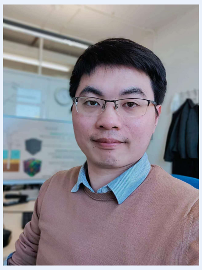
海岸和近海工程国家重点实验室
学术讲堂

题　目： Challenges of the Particle Finite Element Method (PFEM) for Modelling Geotechnical Problems

报告人： 张 雪 博士



时　间： 2023年08月09日 09:30-10:30

地　点： 综合实验一号楼208室 &
腾讯会议房间号：775 8184 2394

内容简介：

Xue Zhang is a Senior Lecturer in Geomechanics at the University of Liverpool, UK. His research centres on advanced numerical methodologies applied to complex geomechanics challenges. He investigates instabilities in geostructures under critical conditions, significantly impacting geotechnical engineering. He's a board member of the UK Association for Computational Mechanics (UKACM) and Editorial Board member for the Journal of Rock Mechanics and Geotechnical Engineering (JRMGE). His notable awards include Australian Geomechanics Society (NSW) Research Award (2013), H2020 Marie Sklodowska-Curie Individual Fellowships (2016), IACMAG John Carter Award (2017), EPSRC (UK) New Investigator Award (2021), and IACMAG Excellent Paper Award (2022).

Abstract: Since its inception in 2004, the Particle Finite Element Method (PFEM) has attracted increasing attention. It has been demonstrated to be a robust and powerful numerical tool for handling various challenging engineering problems. However, several issues arise when applying it to large deformation geotechnical problems. This is largely due to the complex geomaterial behaviour. The history dependency necessitates variable mapping between meshes when adopting the classical PFEM. Linear elements used in the conventional PFEM do not perform well in capturing soil behaviour. Although the smoothed particle finite element method, a variant of the PFEM, allows the use of linear elements and alleviates the variable mapping requirement, it experiences stress oscillation in dynamic analysis. This talk explores the challenges associated with the conventional PFEM in modelling geotechnical problems, followed by the introduction of a new version of the Nodal Integration-based PFEM (N-PFEM) proposed to address these issues. Numerical benchmarks demonstrate the correctness and robustness of the N-PFEM for dynamic analysis of geotechnical problems.

海岸和近海工程国家重点实验室
http://slcoe.dlut.edu.cn
2023年08月09日

联系人：乔东生 qiaods@dlut.edu.cn