

# A DFN Framework with Application to Rock Engineering Characterisation, Analysis & Design

## Webinar

**Dr Mark Cottrell**

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**Date & Time: 2<sup>nd</sup> September 2020 (Wed), GMT+8 (HKT) 6:30pm**

### ABSTRACT

This Webinar presents an integrated methodology and workflow for the characterisation and analysis of naturally fractured rocks. The Lecture's three main sections report on the Discrete Fracture Network (DFN) method and use. The first section focuses on an overarching approach, covering a brief history of the approach, its basic philosophy and typical methodology, as well as outlining data and characterisation requirements of the approach. The second section considers strategies for obtaining key rock mass mechanical descriptions including block size distributions, rock mass measures such as GSI values and key effective rock mass property values. The final section reports how DFN description can be carried forward to perform insightful geotechnical analysis considering in situ stress prediction, kinematic block stability analysis for benches/slopes and tunnels, excavation analysis, and support strategies such as grouting and bolting etc. These workflows are considered key to underpinning the characterisation process as well as the optimised design and construction phases of underground developments.

### THE SPEAKER

Mark Cottrell is Technical Director of the FracMan Technology Group at Golder Associates. Based in the UK, where he has been a member of staff since 2007, taking on a global leadership role with the FracMan software and consulting business in 2018. He acted as leader of FracMan in Europe since 2011. Prior to Golder he was Senior Consultant for Rockfield in Swansea focusing on the ELFEN finite and discrete element analysis of multi-fracturing solids under dynamic loading. He has a 1<sup>st</sup> Class degree in Civil Engineering, MSc in Computational Mechanics, and a PhD in Numerical Methods in Engineering with focus on simulation of blast impact processes on quasi brittle materials.

His current interests cover a broad multidisciplinary set of problems. He regularly provides expertise in geomechanical, geological, geophysical, and engineering areas for the Nuclear Waste, Infrastructure, Mining, and Energy (petroleum/renewables) industries. He has extensive experience in providing know-how to a list of internationally renowned clients covering a wide multitude of problem types, including: fluid interaction and induced seismicity, blast induced fragmentation, in situ stress prediction, tunnel and slope stability, fault reactivation, compaction/subsidence, geomechanical earth models, and hydraulic fracturing.

### Registration & Enquiries:

This Lecture is free of charge. Please register online via the link below:

<https://forms.gle/zoWf1jz1ixSXdzkA7>

Successful applicants will be noticed individually via email. For enquiries, please contact Dr Andy Leung at [andy.yf.leung@polyu.edu.hk](mailto:andy.yf.leung@polyu.edu.hk)