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Distinguished Lecture

THE OHIO STATE UNIVERSITY
COLLEGE OF ENGINEERING

Department of
CIVIL, ENVIRONMENTAL AND GEODETIC ENGINEERING

COMPUTATIONAL SLOPE STABILITY ANALYSIS

D. Vaughan Griffiths, PhD, DSc, PE, D.GE, C.Eng, FICE, Dist.M.ASCE
Professor of Civil Engineering,
Colorado School of Mines

Friday, February 26, 2021
1:00 pm EST | via Zoom
Continuing education credits available

Slope stability analysis remains a central activity for geotechnical practitioners and a continued area of interest and research for academics. A wide range of methodologies for slope stability analysis have been developed, ranging from Taylor's charts from the 1930's to state-of-art random finite element methods for probabilistic analysis.

The lecture describes two simple slope stability analyses that can lead to unconservative (unsafe) solutions. Firstly, a classical problem solved by Taylor is revisited using (i) simple optimization, (ii) elastic-plastic finite elements with strength reduction and (iii) upper- and lower-bound finite element limit analysis. The results show the benefits of the finite element approaches, especially as the slope becomes relatively flat where the simple approach starts to overestimate the factor of safety. Secondly, a probabilistic slope stability analysis is performed using (i) a simple analytical approach and (ii) the random finite element method (RFEM). For the case considered, the analytical approach is shown to underestimate the probability of failure, by failing to account for spatial variability in the form of a correlation length.

**Questions?** Please email **satterfield.3@osu.edu** | **REGISTER**

D. Vaughan Griffiths | 2021 T.H. Wu Distinguished Lecturer
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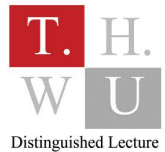
D. Vaughan Griffiths, PhD, DSc, PE, D.GE, C.Eng, FICE, Dist.M.ASCE is a Professor of Civil Engineering at the Colorado School of Mines. His research interests lie in application of finite element and risk assessment methodologies in geotechnical engineering, and his papers on slope stability analysis are among the most highly cited in the geotechnical engineering literature. He is the co-author of three textbooks that have gone into multiple and foreign language editions on "Programming the Finite Element Method", "Risk Assessment in Geotechnical Engineering" and "Numerical Methods for Engineers". He gives regular short-courses on Risk Assessment for practitioners, with recent offerings in China, New Zealand, Australia, Colombia, Norway, Canada, Taiwan and the USA.
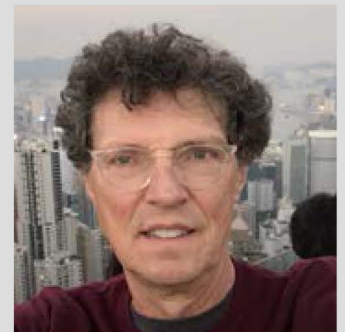
Professor Griffiths is an editor of *Computers and Geotechnics* and is a past editor of JGGE and Advisory Panel member of *Géotechnique*. He has acted as a consultant to industry on projects ranging from landslide analysis to petroleum geomechanics. In 2017, he was named the Cross-Canada Lecturer by the Canadian Geotechnical Society, and the same year received the H. Bolton Seed Medal from the ASCE/Geo-Institute. He served on the Board of Direction of ASCE from 2010-2013 representing Region 7, and was inducted as a Distinguished Member of the ASCE in 2020.

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