



# ASCE GEO-INSTITUTE ARIZONA CHAPTER'S TECHNICAL WORKSHOP

## RISK ASSESSMENT & MANAGEMENT

ASU SkySong | 1475 N. Scottsdale Rd. | Scottsdale, AZ | Nov. 8-9, 2023

### Wednesday (11/8) Schedule:

Start Time	End Time	Topic / Event	Speaker(s) / Host
7:30	8:15	Check-in/Breakfast	
8:15	8:30	AZ G-I Welcome	Austin Olaiz
8:30	10:00	<b><u>Quantitative Analyses in Civil/Geotechnical Engineering</u></b> <ul style="list-style-type: none"> <li>Uncertainty in Civil/Geotechnical Analyses</li> <li>Quantitative vs. Qualitative Assessments</li> <li>Fundamentals of Load &amp; Resistance</li> <li>Conditional Probability &amp; Bayes' Theorem</li> </ul>	D.V. Griffiths
10:00	10:15	Q/A + Break	Austin Olaiz
10:15	11:30	<b><u>Intro to Random Variables for Soil Characterization</u></b> <ul style="list-style-type: none"> <li>Discrete vs. Continuous Variables</li> <li>Common Probability Density Functions</li> <li>Parameter Covariance &amp; Correlation</li> <li>Linear Geotechnical Functions</li> </ul>	D.V. Griffiths
11:30	12:15	Lunch <ul style="list-style-type: none"> <li>AZ G-I Student Scholarship Announcement</li> </ul>	Elizabeth Young Shivangi Jain
12:15	13:45	<b><u>Simple Tools for Geotechnical Probabilistic Analysis</u></b> <ul style="list-style-type: none"> <li>First Order Second Moment Method (FOSM)</li> <li>FOSM Earth Pressure Example</li> <li>First Order Reliability Method (ROFM)</li> <li>FORM Bearing Capacity Example</li> </ul>	D.V. Griffiths
13:45	14:00	Q/A + Break	Joel Ramirez
14:00	15:30	<b><u>Advanced Tools for Geotechnical Probabilistic Analyses</u></b> <ul style="list-style-type: none"> <li>Monte Carlo Methods</li> <li>Monte Carlo Bearing Capacity Example</li> <li>Random Finite Element Method (RFEM)</li> <li>Software Demonstrations of Seepage &amp; Slope Stability</li> </ul>	D.V. Griffiths
15:30	15:45	Q/A + Break	Austin Olaiz
15:45	16:15	<b><u>Risk Assessment 101</u></b> <ul style="list-style-type: none"> <li>Introduction to Risk</li> <li>Role of Site Characterization</li> <li>Engineering Judgement</li> </ul>	Andy Hill
16:15	16:25	Q/A + Open Discussion	Kanyembo Katapa D.V. Griffiths
16:25	16:30	AZ G-I Close Out	Austin Olaiz



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## Thursday (11/9) Schedule:

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7:30	7:55	Check-in/Breakfast	
7:55	8:00	AZ G-I Welcome	Austin Olaiz
8:00	9:15	<b><u>Risk Based Decision Making</u></b> <ul style="list-style-type: none"> <li>Decision Analysis &amp; Criteria</li> <li>Risk</li> <li>Value of Information</li> <li>Case Study</li> </ul>	<b>Bob Gilbert</b>
9:15	9:30	Q/A + Break	Austin Olaiz
9:30	10:15	<b><u>Communicating Risk to Clients &amp; Decision Makers</u></b> <ul style="list-style-type: none"> <li>Subjective Assessment</li> <li>Hazard-Fragility-Consequence</li> <li>Utility</li> <li>Life Safety</li> </ul>	<b>Bob Gilbert</b>
10:15	10:30	Q/A + Break	Austin Olaiz
10:30	11:30	<b><u>Expert Panel Questions &amp; Open Discussion</u></b> <ul style="list-style-type: none"> <li>Communicating Risk between Stakeholders</li> <li>Key Recommendations from Panel Members</li> <li>Questions from Panel to Audience</li> <li>Questions from Audience to Panel</li> </ul>	<b>Bob Gilbert</b> <b>Andy Hill</b> <b>D.V. Griffiths</b> <b>Kanyembo Katapa</b>
11:30	12:00	Lunch <ul style="list-style-type: none"> <li>AZ G-I Chapter Updates</li> </ul>	Austin Olaiz Elizabeth Young
12:00	13:30	<b><u>Carrying Out a Risk Assessment</u></b> <ul style="list-style-type: none"> <li>Upfront work to prepare for a Risk Assessment</li> <li>Potential Failure Mode Analysis (PFMA) process</li> <li>Semi-Quantitative Risk Assessment (SQRA) process</li> </ul>	<b>Andy Hill</b>
13:30	13:45	Q/A + Break	Joel Ramirez
13:45	14:30	<b><u>Eliciting Subjective Probabilities</u></b> <ul style="list-style-type: none"> <li>What are Subjective Probabilities?</li> <li>Estimating Subjective Probabilities</li> <li>Minimizing Bias</li> </ul>	<b>Andy Hill</b>
14:30	15:15	<b><u>Evaluation of SQRA</u></b> <ul style="list-style-type: none"> <li>Risk Tolerability</li> <li>How the results of an SQRA should be used</li> <li>Levee System examples</li> </ul>	<b>Andy Hill</b>
15:15	15:30	Q/A + Break	Elizabeth Young
15:30	16:15	<b><u>Qualitative Risk Assessment of Tailings Facilities</u></b> <ul style="list-style-type: none"> <li>Case Study Example on Tailings Storage Facility</li> </ul>	<b>Kanyembo Katapa</b>
16:15	16:25	<b>Q/A + Open Discussion</b>	<b>Kanyembo Katapa</b> <b>Andy Hill</b>
16:25	16:30	AZ GI Close-Out	Austin Olaiz
16:30	18:00	Happy Hour at FATE Brewing	





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## Meet the Instructors



**D.V. Griffiths** PhD, DSc, PE, D.GE, C.Eng, FICE, Dist.M.ASCE

Vaughan is a **Professor of Civil Engineering at the Colorado School of Mines** and a **2023 Fulbright Distinguished Chair at the University of Newcastle, NSW**. His research interests lie in application of finite element and risk assessment methodologies in geotechnical engineering. 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 Australia, Canada, China, Colombia, New Zealand, Norway, Taiwan and the USA. Professor Griffiths is a past-editor of the journals *Computers and Geotechnics*, *Journal of Geotechnical and Geoenvironmental Engineering* and *Geotechnique*. 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 as the Region 7 Director, and was inducted as a Distinguished Member of the ASCE in 2020. He gave the TH Wu Distinguished Lecture in 2021 and the Wilson Tang lecture in 2022.



**Andy Hill** PE

Andy Hill is a Registered Professional Civil Engineer currently working as a **Senior Geotechnical Engineer and Branch Chief of Geotech Engineering for USACE's Risk Management Center (RMC)**. Mr. Hill has 18 years of experience and has been with the USACE for 15 years, 12 of those with the RMC. He has been involved in the design and construction of multiple dam and levee safety projects and flood risk management structures in that time. Since joining the RMC in 2011, he has served as a Technical and Senior Advisor to multiple dam and levee safety risk cadres facilitating, advising, and co-authoring over 20 Issue Evaluation Study (IES) or Semi-Quantitative Risk Assessments (SQRA) and has served as lead reviewer for over 50 risk assessments.



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## Meet the Instructors



**Bob Gilbert** PE, Ph.D, D.GE, NAE

Dr. Gilbert is **Chair of the Department of Civil, Architectural and Environmental Engineering at The University of Texas at Austin**. He joined the faculty in 1993 after practicing as a geotechnical engineer for five years with Golder Associates Inc. His technical focus is the assessment, evaluation and management of risk for civil engineering systems. He has worked on a variety of large infrastructure projects, including the New Orleans levee system, the east span of the San Francisco Bay Bridge, the Rocky Mountain Arsenal waste disposal project, and many of the world's largest offshore energy production systems. He was elected to the National Academy of Engineering in 2020.



**Kanyembo Katapa** PE, PMP

Kanyembo Katapa is a **Geotechnical Engineering Manager at Freeport McMoran in Phoenix, Arizona**. Kanyembo is a licensed professional engineer with 20 years of professional multidisciplinary civil/environmental engineering experience in mine waste remedial construction and design. Kanyembo has 15 years of professional geotechnical engineering experience including project management, design, and experience with several engineering design/analysis software packages.