
# AEG 2026 AI/Machine Learning Virtual Symposium Program

August 26, 2026
12:00pm-4:00pm Eastern Time

(The session will be recorded for paid attendees to view anytime. 4 PDHs available)

Moderated by Nate Saraceno, GFT Infrastructure, Inc.

Artificial intelligence is rapidly entering applied geoscience practice, but its value depends on how well it is grounded in geologic understanding, field observations, and professional judgment. This half-day virtual symposium will explore how AI-enabled tools, including machine learning approaches, are being used to support geologic interpretation, monitoring, hazard assessment, decision-making, uncertainty evaluation, communication, and professional workflows. The program is intended for geologists, geoscientists, engineers, and other applied professionals interested in how AI is being used responsibly and effectively in geologic practice.

ASSOCIATION OF ENVIRONMENTAL & ENGINEERING GEOLOGISTS

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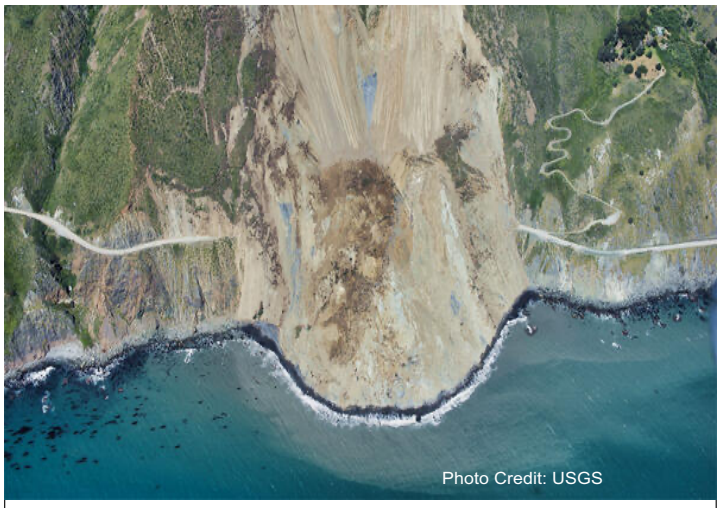
## On the Cover

AI Generated Photo by Nate Saraceno






## Landslides SUPER SCHOOL

November 3-5, 2026 – www.aegevents.org
Marriott Denver West, Golden, Colorado

**November 3-5, 2026**
**Denver West Marriott, Golden, Colorado**
https://www.aegevents.org/landslides-super-school

The landslide super school is planned to include two classroom days and one field day to give attendees a depth of knowledge in landslide identification, characterization, and mitigation. Planned topics include landslide susceptibility and inventories, morphology and landforms, data collection and investigation, and stability modeling and mitigation design.

AEG members - $545
Non-Members - $595
Early Career AEG Member: $445
AEG Student Member: $150 (limited to 20 students)

The workshop will include 3 breakfasts, breaks, 2 lunches, a welcome reception, and a half day field trip.

Hotel rooms will be available at the Denver West Marriott for $159/night. Book your room now before the workshop hotel is full.

PDHs will be available for the workshop.

# AI/Machine Learning
## VIRTUAL SYMPOSIUM

August 26, 2026 – www.aegevents.org

# SYMPOSIUM SCHEDULE

Association of Environmental & Engineering Geologists
12:00-4:00pm Eastern Time

**Moderator:**
Nate Saraceno, GFT Infrastructure, Inc.

| Time | Title | Speaker |
|---|---|---|
| **12:00pm** | **Introduction** | **Nate Saraceno, PG**<br>*GFT Infrastructure, Inc.* |
| **12:05pm** | Digging Deeper with Data: Artificial Intelligence as a Force Multiplier in Environmental and Engineering Geology | **Thomas Oommen, Ph.D.**<br>*Professor and Chair, Department of Geology and Geological Engineering, University of Mississippi* |
| **12:35pm** | Unlocking Legacy Geotechnical Information: AI as a Bridge to Modern Data Management Frameworks | **Scott L. Deaton, Ph.D.**<br>*President, Dataforensics, LLC* |
| **1:05pm** | Introduction to machine learning for PFAS investigations | **Skyler Sorsby, PG (PA)**<br>*Senior Professional, Hydrogeologist in WSP USA, Inc* |
| **1:35pm** | 4D Landslide Hazard Sensing | **Stratis Karantanellis, Ph.D.**<br>*Assistant Professor in the Department of Geological Sciences at California State University, Fullerton (CSUF)* |
| **2:05pm** | **Break** | |
| **2:20pm** | Innovative Hazard Assessment in Engineering Geology Utilizing EdgeAI and Vision Language Models | **John Kemeny, Ph.D.**<br>*Professor Emeritus, University of Arizona* |
| **2:50pm** | AI Ethics: Using Large Language Models in the Geosciences | **Paul Cleverley**<br>*Professor of Information Science & Technology at Robert Gordon University in Scotland* |
| **3:20pm** | Closing Panel Discussion: Responsible AI in Applied Geoscience Practice | **All Presenters** |
| **3:50pm** | Closing Discussion | **Nate Saraceno, PG** |

## Nate Saraceno, P.G.

*GFT, Infrastructure, Inc.*

Nathan R. Saraceno, P.G., is Geohazards Program Manager at GFT, where he supports geologic and geotechnical risk assessment, mitigation, and project delivery for linear infrastructure and other critical facilities. His technical background includes engineering geology, landslide evaluation and remediation, geologic mapping, slope stability, sinkhole and mine subsidence mitigation, and corridor-level geohazard assessments. Nate is also an active user of GFT's Enterprise ChatGPT and Microsoft Copilot licenses, applying AI tools to improve technical communication, project organization, and decision support in day-to-day consulting work. He has been actively involved with the Association of Environmental & Engineering Geologists for many years, including national leadership roles and service as AEG Past President in 2023.

## Scott L. Deaton, Ph.D.

*President, Dataforensics, LLC*

Scott Deaton is President and Founder of Dataforensics, a software company that specializes in helping geo-engineers use technology to improve and streamline their data collection, data management, reporting, analysis and visualization processes. He has guided Dataforensics to become the first software vendor that can import and export DIGGS data in their software and pioneered the usage of DIGGS within the OpenGround Cloud environment. Dataforensics is responsible for many enterprise implementations of OpenGround in North America for organizations like the U.S. Army Corps of Engineers, LADOT, OHDOT, NMDOT, MSDOT, MODOT, ILDOT, WSP/Golder/ Wood, Haley & Aldrich, S&ME, Braun Intertec and many more.

**Abstract:**

**Unlocking Legacy Geotechnical Information: AI as a Bridge to Modern Data Management Frameworks**

Dataforensics is leveraging AI and modern cloud technology to transform historical geotechnical data into a reliable, structured subsurface data asset. It highlights the challenges posed by legacy systems like gINT, including inconsistent schemas, poor data structures, missing information, and outdated formats. The presentation explains how migrating to Bentley's OpenGround enables scalable, integrated workflows, improved data accessibility, and alignment with modern engineering standards. Dataforensics' AI-enhanced data extraction approach integrates OCR, machine vision, deep learning, LLMs, and algorithmic techniques to accurately capture information from logs, reports, plan sheets, and test results. With a robust data library built from decades of field activity and over 525,000 boreholes, the system improves accuracy, efficiency, and consistency across large datasets. Real-world examples, include a major USACE migration effort, demonstrate significant time savings and strong ROI, making high-quality subsurface data more attainable than ever.


## Stratis Karantanellis, Ph.D.

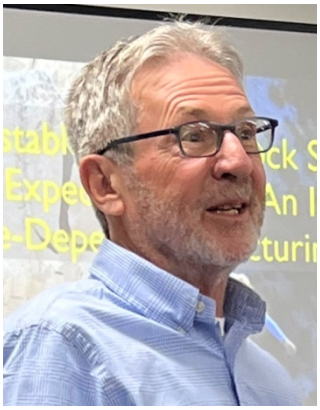
*Assistant Professor in the Department of Geological Sciences at California State University, Fullerton (CSUF)*


Stratis Karantanellis is an Assistant Professor in the Department of Geological Sciences at California State University, Fullerton, specializing in Remote Sensing, Engineering Geology, and Geohazard assessment. He has collaborated on projects focused on geohazard risk reduction and response, using close-range remote sensing and Object-Based Image Analysis (OBIA). Stratis brings extensive experience in landslide and rockfall hazard assessment and mitigation planning, contributing to research in the USA, Europe, and globally. He has received multiple awards for his contributions to the field, including the Excellence Early Career Award from Aristotle University of Thessaloniki in Greece.


**Abstract:**

**4D Landslide Hazard Sensing**

Landslides continue to pose substantial threats to lives, infrastructure, and the environment worldwide. For decades, engineering geologists have relied on proven traditional methods, such as field mapping, geotechnical surveys, borehole sampling, and manual monitoring of slope stability, to assess and mitigate landslide hazards. While these techniques remain essential for ground truthing and understanding site-specific processes, they often struggle to capture the spatial and temporal complexity of rapidly evolving slopes. This presentation explores the synergy between traditional ground-based approaches and advanced 4D remote sensing technologies, which collect three-dimensional data over time to map and monitor landslides with unprecedented detail. Modern tools, including satellite imagery, UAS-based photogrammetry, and terrestrial LiDAR, when combined with sensor networks, provide continuous, high-resolution information on slope movement, deformation, and triggering events. By integrating these datasets with object-based frameworks, we enhance our ability to characterize landslide mechanisms and support comprehensive hazard assessment. The true potential is unlocked through artificial intelligence: machine learning algorithms ingest and analyze these multi-modal, multi-temporal data to automate hazard classification, identify complex precursors, and predict future landslide activity.

# John Kemeny, Ph.D.

*Professor Emeritus, University of Arizona*

Dr. John Kemeny is Professor Emeritus in the School of Mining Engineering & Mineral Resources at the University of Arizona. His specialties are geomechanics, slope stability, rock fracture mechanics, numerical simulation in rock mechanics, and developing 3D imaging and sensing technologies for geotechnical applications. Dr. Kemeny was Partner and Co-Founder of Split Engineering LLC, a spin-off company from the University of Arizona started in 1997 that became a world leader in the development and sales of vision-based rock fragmentation measurement software and point-cloud based rock mass characterization software. The company had offices in the US, Chile, Peru, South Africa and Australia and was acquired by Hexagon Mining in 2019. Dr. Kemeny has also been heavily involved in innovative approaches to engineering education, including the development and teaching of online, flipped and executive ed courses for over 20 years. Dr. Kemeny has over 40 years of experience in rock mechanics and rock engineering. At the University of Arizona over the past 35 years, Dr. Kemeny has published over 175 papers, given over 80 invited technical talks and workshops and graduated 15 PhD and over 50 masters students. Dr. Kemeny has been at the University of Arizona since 1989 and was Head of the Mining and Geological Engineering department from 2015 through 2019. More recently, Dr. Kemeny was the 2024-2025 AEG/GSA Richard H Jahns Distinguished Lecturer where he gave 48 lectures at colleges and professional chapters across the US. He is currently working with several colleagues on new approaches to geotechnical hazard assessment using modern geospatial and AI tools.

**Abstract:**

**Innovative Hazard Assessment in Engineering Geology Utilizing EdgeAI and Vision Language Models**

Even without the use of AI, geosensing and geospatial systems have been experiencing a rapid evolution in the past few years with smallsats, drone lidar, digital twins, gaussian splatting, and many other innovations. This talk discusses two AI-based advances that can add additional usefulness to these systems: 1) EdgeAI (also referred to as TinyML) and 2) Vision Language Models (VLMs). EdgeAI is the process of putting trained AI models (including Generative AI and Foundation Models) onto small edge devices such as ground sensors, drones, mobile devices and wearables. Advantages of putting the AI onto the edge device are many and include privacy, energy consumption, latency, and cost. VLMs are Large Language Models (LLMs) with the addition of a vision encoder that allows images (and sounds) to be analyzed and interpreted. In terms of hazard monitoring and decision-making, VLMs can perform much like humans. For example, given a picture of a large block partially blocking a highway, the vision encoder detects the rock on the highway and the LLM part of the VLM understands that this is a hazard and so communicates the severity of the hazard to appropriate channels. If the VLM detects a newly dislodged rock block in a ditch, on the other hand, the LLM part of the VLM understands and communicates it as a lower priority event. Based on the author's own studies and experience with EdgeAI and VLMs, this talk will cover examples that include rockfall, landslides, rock mass characterization and flooding. In addition, the author discusses the advantages of combining these two technologies to produce cost-effective, far-reaching hazard-assessment systems for the future.


# Thomas Oommen, Ph.D.

*Professor and Chair, Department of Geology and Geological Engineering, University of Mississippi*


Dr. Thomas Oommen began his academic career at Michigan Technological University, serving 13 years in geological engineering and progressing from assistant to associate to professor. He has contributed significantly to understanding earth materials, geologic processes, and geohazards, applying those insights to engineering and hazard mitigation. Oommen's research leverages remote sensing and machine learning to address critical issues in site characterization, infrastructure monitoring, and geohazards. Recognized for developing collaborations across academia, government, and industry, he has secured over $12 million in research funding from various agencies and industry partners, authored over 100 peer-reviewed journal publications, and advanced transformative approaches to engineering geology. An active leader, Oommen has served as past chair of the Geological Society of America's Environmental and Engineering Geology Division. He currently chairs the American Society of Civil Engineers–Geo-Institute's Engineering Geology and Site Characterization Committee, is chair of the Awards Committee of the American Geophysical Union Natural Hazards Section and is AEG's co-editor for the Environmental & Engineering Geoscience journal. With a strong commitment to mentorship, he guides students and cultivates a supportive, research-focused environment.


**Abstract:**

**Digging Deeper with Data: Artificial Intelligence as a Force Multiplier in Environmental and Engineering Geology**

Artificial intelligence is reshaping environmental and engineering geology by enabling more accurate, scalable, and timely analysis of subsurface conditions, geological hazards, and earth-surface processes critical to infrastructure planning and risk management. Machine learning and deep learning approaches now support landslide susceptibility mapping, ground deformation monitoring, and soil characterization at spatial scales and resolutions previously unattainable through conventional field-based or numerical methods. In environmental geology, AI-driven remote sensing platforms such as Google Earth Engine facilitate continuous monitoring of surface water quality, soil moisture dynamics, contamination indicators, and land-cover change, providing actionable intelligence for groundwater protection, remediation planning, and regulatory compliance. Physics-informed neural networks and hybrid models that integrate geomechanical and hydrogeological domain knowledge into data-driven frameworks offer physically consistent predictions suited to the interpretability demands of engineering practice. However, translating AI research into operational geotechnical and environmental workflows presents persistent challenges, including limited labeled training data in geologically complex settings, model transferability across site conditions, and the need for uncertainty quantification in safety-critical applications. Advancing practical AI for environmental and engineering geology requires standardized benchmark datasets, reproducible end-to-end pipelines, and governance frameworks ensuring that model outputs meet the accountability and reliability standards expected in professional geoscience practice.
adaptation of the base model to new geomorphic settings with as few as 600–700 additional training landslides, yielding substantial performance gains. We demonstrate results across diverse landslide morphologies, including small translational failures in Kentucky, long-runout debris flows in North Carolina, and low-angle glaciolacustrine landslides in the Western Canadian Sedimentary Basin, highlighting the model's potential for broad application.


# Paul Cleverley

*Professor of Information Science & Technology at Robert Gordon University in Scotland*


Paul is a geologist and computer scientist by background. He currently serves as Visiting Professor of Information Science & Technology at Robert Gordon University in Scotland, and is Chair of the AI Ethics Task Group of the Geoethics Commission of the International Union of Geological Sciences (IUGS)


**Abstract:**

**AI Ethics: Using Large Language Models in the Geosciences**

Large Language Models (LLMs) should be used responsibly in the geosciences, weighing their benefits against significant risks including over-trust, bias, reduced reproducibility, data privacy concerns, sycophancy, and environmental cost. The presentation distinguishes critical thinking from ethics, and argues that the decision to use AI is context-dependent. Sometimes the most ethical choice is not to use it at all. Drawing on a conceptual model of AI digital literacy grounded in self-reflexivity and human oversight, it sets out what "good" looks like for geoscientists working with AI. This includes using it to support rather than replace professional judgment, maintaining transparency and traceability, addressing bias and fairness, and exercising epistemic humility. The central message is that LLMs do not reduce risk so much as redistribute it, and that uncritical use is itself a core ethical hazard.



## Skyler Sorsby, PG (PA)

*Senior Professional, Hydrogeologist in WSP USA, Inc*


Skyler Sorsby, PG (PA) is a Senior Professional, Hydrogeologist in WSP USA, Inc's Mount Laurel, NJ office. He has experience logging and interpreting remediation site geology in fractured rock, karst, and complex geomorphic environments. He also co-leads WSP's data science practice and applies digital tools to groundwater models and PFAS site investigations.


**Abstract:**

**Introduction to Machine Learning for PFAS investigations**

As a large class of environmentally-mobile organic chemicals, per- and Polyfluoroalkyl substances (PFAS) represent a pervasive and nebulous threat to many sites. While traditional tools for defining the conceptual site model (CSM) are necessary, like establishing three-dimensional hydrostratigraphy, flow pathways, groundwater-surface water interactions and the site history, the inherently multivariate nature of PFAS introduces additional challenges. This talk will focus on simpler machine-learning tools to support PFAS CSMs, including 1) clustering for evaluating site-specific anthropogenic background, 2) matrix factorization to produce data-driven fingerprints, 3) classification for source screening, and 4) regression for quantitating correlations with multiple-lines-of-evidence. Strengths and weaknesses of each approach will be discussed, as well as overall strategies for implementation.