



## From the President



JIE HAN

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## Fostering Innovation for the Future

In September 2023, I had the privilege of visiting Florence, Italy, where I delved into the rich history of the Renaissance to experience firsthand the birthplace of this transformative period. The Renaissance, as both a historical era and a cultural movement, represents a pivotal transition from the Middle Ages to modernity, marked by plenty of groundbreaking innovations. The city's profound cultural legacy left me with many never-to-be-forgotten memories, particularly in Renaissance art and architecture.

The multitude of arch structures, showcasing different shapes and sizes in two- and three-dimensions, captivated me in a unique way. The intricate interplay of these architectural domes and windows resonated with the soil arch models I've researched during the past 25 years in the context of column-supported embankments and buried structures at different magnitudes of soil movements. The design and construction of the dome for the Cathedral of Santa Maria del Fiore (also known as the Duomo and shown in the photo) is one of the best examples of innovations in civil engineering history. To construct the brick walls of the dome, sculptor and architect Filippo Brunelleschi employed a novel herringbone (V-shaped) and self-supporting pattern between the horizontal field bricks and vertical bricks at the beginning and end of the horizontal rows.

This out-of-the-box thinking and design and other innovations helped earn him the reputation as one of the world's most famous innovators in art and engineering. Witnessing such a convergence was truly inspiring. It highlighted for me the enduring impact of innovative thinking during that historical period, and how it catalyzed advancements that continue to shape our world today.

Whether the practice of geotechnical engineering is now mature and considered to be a commodity is up to debate. It's a fact, however, that innovations have never stopped in our field since soil mechanics was established, and the geotechnical engineering discipline was born nearly a century ago. But the profound impacts of our changing climate and technological advancements in recent years present both challenges and opportunities to our profession that will





The Cathedral of Santa Maria del Fiore in Florence, Italy.

necessitate rapid and increased levels of innovation. Notably, artificial intelligence has emerged as a transformative force in our daily lives and within the realm of geotechnical engineering practice as well. It's imperative that we embrace these challenges and leverage new materials and technologies to construct infrastructure systems that are not only more efficient, but also more resilient.

Acknowledging the critical role of innovation in our profession, the G-I board two years ago instituted a board-level committee, "Innovative Technologies & Tools in Geotechnical Engineering" (the Innovation Committee for short). This committee has been tasked with developing activities to foster innovation in geotechnical engineering and address diverse aspects like new materials (e.g., smart and functional materials), cutting-edge equipment (automatic data acquisition

systems), innovative installation methods (bio-inspired anchors), advanced sensing technology (remote sensing and drones), rapid test procedures (geophysical methods), and advanced data analysis methods (artificial intelligence and machine learning). Since its establishment, the Innovation Committee has played an important role by organizing events that facilitate the exchange of ideas pertaining to innovations in geotechnical engineering. Indeed, the future of our profession lies in the continued evolution of these innovative practices.

In our profession, scholars and engineers often receive recognition after many years of accumulated contributions and achievements. But given the rapid pace of developments in our world, such delayed acknowledgment is insufficient to encourage and recognize timely innovation. Consequently, it's imperative that the

G-I board develop proper mechanisms to proactively promote and recognize innovations within our profession. This commitment to fostering innovation stands as the foremost priority of this board of governors, reflecting a collective determination to propel our geotechnical engineering practice into a dynamic and forward-looking future. Please share with me your ideas for best moving forward on this quest, or other matters of interest to you as a G-I member. 



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