

Technological trends shaping the future of wind engineering

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ABSTRACT

The impact of the fourth industrial revolution is being felt by every field, including wind engineering and science. Traditional trial and error approaches for research design and execution are gradually being replaced with workflows that harness ML/AI and high throughput testing. Robotics, IoT devices, and advanced human-centered computing tools are approaching ubiquity in the research setting. Access to experimental and high-performance computing infrastructure, curated data sets, and research software continues to grow. Domestic and international public access policies are driving open sharing of research findings, significantly lowering barriers to exploring the knowledge base. Educational practices are evolving to meet the needs of a workforce that is increasingly embracing short-term, skills-based programs for credentialing, upskilling, and job recruitment/placement. And access to student talent is growing as delivery of curricula becomes more flexible and as higher education reaches more people across the globe.

These trends are rapidly changing R&D, reshaping requirements for technical core competencies, and motivating larger public and private sector investments in research and workforce development. They are also creating pathways for diverse technical perspectives to inform the study of “wind” problems old and new. This presentation will explore emerging technology trends and evaluate their interplay with efforts to develop solutions to reduce the loss of life and property during extreme wind events. It will also address the critical need for our field to work together more collaboratively if we are to continue providing leadership in the study and mitigation of climate-driven hazard impacts.