UNIVERSITY of WASHINGTON

i3CE 2027

# Call for Papers

## 2027 ASCE International Conference on Computing in Civil Engineering

*AI-Empowered Computing for Safer, Smarter, and More Resilient Civil Infrastructure Systems*

**JULY 19 – 22, 2027**

Husky Union Building (HUB) | University of Washington, Seattle





# Invitation to contribute

The American Society of Civil Engineers (ASCE) International Conference on Computing in Civil Engineering (i3CE 2027) invites researchers, practitioners, educators, students, technology developers, and public-sector professionals to contribute to the advancement of computing and digital technologies in civil and construction engineering.

Hosted at the University of Washington in Seattle by Pacific Northwest Transportation Consortium (PacTrans) and Washington State Transportation Center (TRAC), i3CE 2027 will provide an international forum for presenting innovative research, emerging technologies, practical applications, and new perspectives on how computing is transforming the planning, design, construction, operation, maintenance, safety, and resilience of the built environment.

The conference particularly welcomes research that connects advances in artificial intelligence, autonomous systems, digital twins, sensing, visualization, data science, and human-centered computing with important challenges facing civil infrastructure.

## Technical areas

Submissions are invited in the following nine technical areas. The topics listed under each track are illustrative and are not intended to be exhaustive.

### Track 1. Artificial Intelligence in Design, Construction, Operations, and Maintenance

- Machine learning and deep learning
- Computer vision and multimodal sensing
- Explainable and trustworthy AI
- Predictive and prescriptive analytics
- Geospatial AI and spatial intelligence
- AI-enabled infrastructure management
- Intelligent transportation and mobility applications
- Data-driven engineering design and decision support

### Track 2. Robotics, Automation and Autonomous Systems

- Construction robotics
- Autonomous and semi-autonomous systems
- Human-robot collaboration
- Teleoperation and remote operations
- Autonomous inspection
- Uncrewed aerial and ground systems
- Robotic perception and navigation
- Automated construction processes
- Field robotics and intelligent equipment



## Track 3. BIM, Reality Capture, and Digital Twins for Infrastructure

- Building and infrastructure information modeling
- Digital twins and cyber-physical systems
- Reality capture and scan-to-BIM
- Point-cloud and image-based modeling
- Internet of Things and connected infrastructure
- Real-time data integration and synchronization
- Semantic modeling and knowledge representation
- Information interoperability and open data standards
- Lifecycle information management
- Digital thread technologies

## Track 4. Visualization and Extended Reality

- Virtual reality
- Augmented reality
- Mixed reality
- Immersive visualization
- 3D and 4D modeling
- Interactive simulation
- Spatial computing
- Visualization for planning and decision support
- Human interaction with virtual built environments

## Track 5. Sustainable and Resilient Infrastructure Systems

- Infrastructure resilience and adaptation
- Climate-informed infrastructure analytics
- Predictive maintenance
- Structural and infrastructure health monitoring
- Risk and reliability modeling
- Smart and sustainable cities
- Energy and building systems
- Lifecycle assessment and optimization
- Computing for disaster preparedness and recovery
- Data-driven asset management

## Track 6. Human-Centered Innovations

- Human-machine interaction
- Human-robot collaboration
- Human-AI teaming
- Human-building interaction
- Wearable and mobile technologies
- User-centered infrastructure systems
- Cognitive and behavioral modeling
- Technology adoption and acceptance
- Responsible and ethical computing
- Workforce-technology interaction



## Track 7. Health, Safety, and Emergency Technologies

- Construction and infrastructure safety technologies
- Computer vision for infrastructure and transportation engineering
- Predictive and proactive safety analytics
- Worker safety and health
- Connected and wearable safety systems
- Transportation and roadway safety technologies
- Emergency detection and response
- Disaster management technologies
- Risk communication and decision support

## Track 8. Technology-Enhanced Engineering Education and Training

- AI-assisted engineering education
- Virtual and augmented reality for training
- Engineering simulation and serious games
- Workforce development
- Digital learning environments
- E-learning platforms
- Interactive engineering education
- Computing curricula for civil engineering
- Human-AI collaboration in education
- Professional training and lifelong learning

## Track 9. Emerging and Cross-Cutting Computing Technologies

- Large language models and vision-language models
- Foundation models and agentic AI
- Generative AI
- Quantum computing and quantum-inspired optimization
- High-performance and accelerated computing
- Cloud, edge, and distributed computing
- Cybersecurity and privacy-preserving computing
- Blockchain and distributed ledger technologies
- Federated and decentralized learning
- Privacy-preserving AI
- Scientific computing
- Advanced computational optimization
- Emerging computing architectures
- Novel computational methods for the built environment

# Submission and participation

## Types of contributions

**Full research papers.** Mature research supported by appropriate methods, experiments, validation, case studies, or theoretical development. Recommended maximum: 10 pages, including references. An abstract submission is required before a full paper.

**Short papers.** Emerging research, innovative concepts, preliminary findings, demonstrations, and early-stage investigations. Recommended length: 5 pages, including references.

## Important dates

The following are the important dates for i3CE 2027.

| Milestone | Date |
|---|---|
| Call for Papers | September 30, 2026 |
| Special session proposal deadline | November 30, 2026 |
| Abstract submission deadline | December 1, 2026 |
| Abstract decision | January 1, 2027 |
| Full and short paper submission | February 15, 2027 |
| Paper acceptance notification | April 15, 2027 |
| Final paper and copyright submission | May 15, 2027 |
| Early registration deadline | May 30, 2027 |
| Presenter and proceedings registration deadline | June 15, 2027 |
| **Conference** | July 19 – 22, 2027 |

Submission deadlines are 11:59 p.m. Anywhere on Earth (AoE), unless otherwise noted.

## Review and publication

All submissions will undergo peer review. Accepted full and short papers that satisfy ASCE publication requirements are intended for inclusion in the i3CE 2027 conference proceedings, subject to final confirmation of the publication agreement and requirements. At least one author of each accepted paper should register and present in accordance with final ASCE requirements.

## Formatting and special sessions

Papers must follow ASCE formatting guidelines. The Word template and submission instructions will be provided with the submission portal. Special-session proposals are encouraged. Detailed proposal guidelines and submission instructions will be announced on the conference website: https://i3ce2027.org.

## Venue and contacts

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