# — Call for Papers —

A Special Joint Session on

## <span style="color:red">Intelligence Augmentation for Human Systems Integration</span>

*The Systems Engineering Information & Knowledge Management Technical Committee*
*The Design Theory and Methodology Technical Committee*

The ASME 2021 Virtual International Design Engineering Technical Conferences & Computers and Information in Engineering Conference (IDETC/CIE 2021)
August 17 – 20, 2021

## Paper Submission Deadline: February 23, 2021

## <span style="color:red">Symposium Description and Themes</span>

Through the past decade, we have seen rapid automation through artificial intelligence (AI) touching almost every industry. However, the design, operation, and maintenance of many complex systems require human decisions and supervision. This makes the human-centered design of AI systems critical, which leads to the concept of Intelligence Augmentation (IA). IA focuses on AI's assistive role, emphasizing its design as complementary to human intelligence. IA achieves better operational performance by explicitly designing AI systems to assist and augment human performance. It has the potential to propel the design and operation of complex systems in coming decades: from maintenance management in manufacturing to socio-technical cybersecurity systems in power grids and defense systems (e.g., Human Autonomy Teaming).

Since complex systems engineering will continue to be a predominantly human-based enterprise, advances must incorporate the strengths and weaknesses of both humans and algorithms to enable Human Systems Integration (HSI). This paradigm shift toward collaboration between humans and systems must be holistically applied, as mounting technological, logistic, organizational, and cultural challenges stand between the current state of practice and complex systems engineering of the future. In this special session, specific topics of interest include, but are not limited to:

- Human collaboration and competition with artificial agents in teams, crowds, and with individuals
- Uses for AI and other algorithmic enhancement in support of systems design and operation
- Technologies (e.g., sensory feedback) that address trust, confusion, and obfuscation in systems design, integration, and operation.
- Decision models for deciding whether, when, and how to access human inputs
- Natural language processing for work-order annotation, data structuring, and expert elicitation
- Application of knowledge graphs or ontologies for contextualizing AI in information acquisition, e.g., via question-answering.
- Data-driven anthropometric or behavioral models, e.g., to quantify error sources and prevent mistakes and shortcomings of individuals
- Novel visualization tools and user interfaces with quantified improvements over traditional methods
- Individual differences that impact collaboration with and acceptance of artificial intelligence

## <span style="color:red">Organizers</span>

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