

Greetings CIE COMMUNITY! We are excited to return in person to the 42nd Computers and Information in Engineering Conference (CIE). See below for some highlights of the week, including a Monday morning Keynote, Monday afternoon Awards Luncheon, and Monday evening reception. We look forward to seeing you all in St. Louis!

***Paul Witherell, CIE Conference Chair***

***Caterina Rizzi, CIE Program Chair***

**PLEASE READ THROUGH TO LEARN ABOUT WHAT IS HAPPENING (including free drinks and dinner!)**

## **The 2022 ASME CIE Conference Highlights: Reception, Awards, Keynotes, Panels, Division Meetings**

### **SUNDAY, AUGUST 14**

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#### **CIE SEIKM Hackathon**

The CIE SEIKM Hackathon concludes on Sunday evening with winners to be announced at awards dinner. Winners will be announced at CIE Awards Luncheon on Monday.

### **MONDAY, AUGUST 15**

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#### **CIE Keynote Talk**

The CIE Keynote Talk will be on Monday morning at 10:50 AM from Dr. Azad M. Madni, Executive Director of University of Southern California's Systems Architecting and Engineering Program. Dr. Madni will present "TRANSDISCIPLINARY SYSTEMS ENGINEERING: EXPLOITING CONVERGENCE OF SYSTEMS ENGINEERING WITH OTHER DISCIPLINES"

#### **CIE Honors and Awards Luncheon**

On Monday afternoon at 12:10 PM, come for lunch and stay to recognize some of the longstanding and emerging leaders of our community. Several Division-level awards will be handed out including Lifetime Achievement, Leadership, Research Excellence, and CIE Best Paper. Please note that tickets were included with full registration purchases (for either CIE or DED Luncheon).

#### *The CIE SEIKM Hackathon Panel*

The CIE SEIKM Hackathon Panel will be held at 4:10 PM Monday afternoon. The panel is titled "The Role of Hackathon Mechanism in Promoting Data Science in Mechanical Engineering Research and Education: Perspectives from Academia and Industry." Panelists

will include Zhenghui Sha from UT Austin, Yan Lu from NIST, Sang Joon Park from MedicalIP, Ye Wang from Autodesk, and Nikhil Gupta from NYU.

### **CIE Reception and CIE Student Poster Session**

This year the CIE will hold a reception in conjunction with the CIE Student Poster Session. Come see selected CIE posters (All Stipend Awardees) and learn about their cutting-edge CIE research. The reception will be a cash bar with tickets to be provided for the first drink, use the time to reconnect in person with colleagues we have not seen in a few years!

## **TUESDAY, AUGUST 16**

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### **CIE Keynote Panel**

The CIE Keynote Panel will be held on Tuesday morning at 9:10 AM. The panel, "Education for Modeling and Simulation: Emerging Needs and Recent Trends," will discuss changing environments and emerging trends driving new educational requirements in modeling and simulation. Panelists will include Mike Payne for Kenesto, Gaurav Ameta from Siemens, John Michopoulos from the Naval Research Lab, Cameron Turner from Clemson University and Daniela Faas from the Franklin W. Olin College of Engineering.

### *JCISE Journal Spotlight*

The JCISE Journal Spotlight will highlight leading articles over the past year. Come join Journal Editors SK Gupta (outgoing) and Yan Wang (incoming) to hear about cutting edge technology published in the CIE Division's archival publication outlet.

### **CIE Division Meetings**

The CIE Division Meeting and Technical Committee meetings will be held on Tuesday evening at the Midway Suites. The four TC meetings will begin at 6:00 pm and dinner will be provided to the first 20 meeting attendees (first come first serve basis). The CIE General Meeting will immediately follow at 7:00 PM. All are welcome, come have your voice heard as the CIE Division looks towards our post-Pandemic future!

## **WEDNESDAY, AUGUST 17**

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### *VES Panel*

The VES Panel titled "Virtual Environments and Systems for Makers" will be held on Wednesday morning at 8:00 AM. Panelists include Julie Linsey from Georgia Institute of Technology, Jessica Menold from Pennsylvania State University, and Marco Rossoni from Politecnico di Milano.

# **CIE Keynote Speaker: Azad M. Madni, Ph.D., University Professor of Astronautical Engineering University of Southern California**

**Keynote Title: TRANSDISCIPLINARY SYSTEMS ENGINEERING: EXPLOITING CONVERGENCE OF SYSTEMS ENGINEERING WITH OTHER DISCIPLINES**

**Time: 10:50 AM EST, Monday, August 15, 2022**

**Abstract:** With ever-increasing systems complexity and the growing emphasis on sociotechnical systems, systems engineering is undergoing a significant transformation to increase both methodological rigor and flexibility of modeling methods. However, there is another trend that is equally important – the growing convergence of systems engineering with other disciplines. This trend is a key enabler of transdisciplinary systems engineering, which I define as a meta-discipline that exploits the convergence of systems engineering with other disciplines to frame and solve problems that appear intractable when viewed solely through an engineering lens. To illustrate the application of transdisciplinary systems engineering, my talk will focus on exploiting the synergy of Model Based Systems Engineering and Entertainment Arts. Specifically, I will show that by transforming system models into stories that can be executed in virtual worlds, it becomes possible to increase the understanding and participation of all stakeholders, especially in upfront engineering. I will illustrate the use of this approach within the context of a campus security system. I will conclude by reviewing key concepts from other disciplines that can also be exploited in systems engineering to increase system life cycle coverage and enhance system modeling and verification.

## **Biography**

Dr. Azad Madni is a University Professor of Astronautical Engineering, holder of the Northrop Grumman Fred O'Green Chair in Engineering (<https://sae.usc.edu/people/azad-madni/>). He is the Executive Director of University of Southern California's Systems Architecting and Engineering Program (<https://sae.usc.edu/>). He is also the Founding Director of the Distributed Autonomy and Intelligent Systems Laboratory. He has joint appointments in the Department of Aerospace and Mechanical Engineering and Sonny Astani Department of Civil and Environmental Engineering. He has courtesy appointments in the Rossier School of Education and Keck School of Medicine where he is a faculty affiliate of the Ginsberg Institute for Medical Therapeutics. He is a member of the National Academy of Engineering and Life Fellow/Fellow of several professional societies including AAAS, IEEE, AIAA, INCOSE, IISE, IETE, AAIA, SDPS, and the WAS. His research focus is on transdisciplinary systems engineering, adaptive cyber-physical-human systems,

augmented intelligence, AI and machine learning in complex systems modeling, Model Based Systems Engineering for Advanced Manufacturing, and Digital Twin Technologies for industrial and biomedical applications. He has received in excess of \$100M from research sponsors in government, aerospace, and automotive industries. He serves on the research councils of two DOD centers, DOD's Digital Engineering Body of Knowledge Governance Board, IISE Body of Knowledge Steering Committee.

## **CIE Keynote Panel**

### **Education for Modeling and Simulation: Emerging Needs and Recent Trends**

**Moderators: Krishna Kaipa, Caterina Rizzi**

**Time: 9:10 AM EST, Tuesday, August 16, 2022**

Modeling and simulation (M&S) are becoming increasingly pervasive across multidisciplinary areas of mechanical engineering, design engineering and data science, whilst offering methods and tools for rapid design and modeling, cost-saving simulation, effective visualization, robust analysis, and communication across technical boundaries.

The landscape of this emerging field has been undergoing major changes as we transition from M&S of systems in the current era (e.g., internal combustion engines, planes, etc.) to modern systems (e.g., digital twins, robotics, additive manufacturing, quadcopters, drones, etc.) of the present and future. The complexity of models, model usage, and work environment has changed radically over these years. This raises the question of whether the educators are adequately preparing the engineering graduates with the proper M&S skills and academic requirements of the next generation.

In this panel, we will hear from experts in the industry, academia, and government about how the digital- and advanced technology trends and needs are changing the educational of M&S. Is the new workforce properly skilled and trained for M&S adoption, integration and application? What are the respective revisions and interventions to be incorporated into the teaching and learning curricula at the undergraduate and graduate levels?

Furthermore, the panel will discuss the advancement of remote teaching, hybrid learning and on-line education in the event of potential outbreak of airborne diseases, pandemics or prevention of disease transmission.

Panelists will include Mike Payne from Kenesto, Gaurav Ameta from Siemens, John Michopoulos from the Naval Research Lab, Cameron Turner from Clemson University and Daniela Faas from the Franklin W. Olin College of Engineering.

## **ASME CIE SEIKM PANEL**

### **The Role of Hackathon Mechanism in Promoting Data Science in Mechanical Engineering Research and Education: Perspectives from Academia and Industry**

**Host: Hyunwoong Ko**

**Co-Host: Zhuo Yang**

**Time: 4:10 PM EST, Monday, August 15, 2022**

#### **PANEL DISCUSSION & HIGHLIGHTS**

- Ways and mechanisms to build academia-industry relationships in providing ME students with practical data-driven engineering problems and hands-on experiences.
- Strategies to train the data-literate mechanical engineers that can harness the data revolution in different engineering fields.
- Connection/gaps between data science education in the classroom and data science applications in industry.

Panelists will include Zhenghui Sha from UT Austin, Yan Lu from NIST, Nikhil Gupta from NYU, Ye Wang from Autodesk, and Daniele Grandi from Autodesk.

## **CIE VES Panel**

### **Virtual Environments and Systems for Makers**

**Organizer: Vinayak R. Krishnamurthy**

**Time: 8:00 AM EST, Wednesday, August 17, 2022**

Recent years have seen a significant academic, industrial, entrepreneurial, and public interest in virtual environments and systems as well as making. On the one hand, the rise of maker culture has led to heavy investment in additive manufacturing, digital fabrication, and prototyping-based design. On the other hand, novel technologies in extended (virtual/augmented/mixed) reality have started becoming integral to industrial as well as entertainment applications. The purpose of this panel discussion is to explore: (1) where these two domains (VES and making) meet, (2) how they will give rise to new research

and development opportunities, (3) what intellectual challenges lie ahead in operationalizing VES for makers, (4) how such a combination may impact innovation in design and manufacturing, and (5) what steps we should take as researchers to investigate this exciting avenue. We will seek views and arguments from a panel of experts coming from a wide range of areas including computer-aided product design, digital fabrication, design education, and virtual environments and systems.

Panelists will include Julie Linsey from Georgia Institute of Technology, Jessica Menold from Pennsylvania State University, and Marco Rossini from Politecnico di Milano.