COMPUTERS & INFORMATION IN ENGINEERING DIVISION

MESSAGE FROM THE CHAIR

ROBERT E. WENDRICH

Welcome to the 2024-2025 edition of the Computers and Information in Engineering Division newsletter. As the Chair of the Division, I would like to extend my sincere thanks to the Technical Committees (TCs), Executive Committee members, and all of our other volunteers, for making the IDETC-CIE 2024 Conference in Washington, D.C. a tremendous success. Due to your dedicated services and voluntary contributions to the CIE division, we can look back on a successful conference and community gathering. On behalf of the CIE Executive Committee and TCs, I send our best wishes to the CIE community.

'The scope of work in our CIE community is amazingly extensive and intertwined with all engineering disciplines. As a very important branch of mechanical- and design engineering, CIE has made profound impacts to designers, engineers and our society in general' (Yan Wang, 2019 and Robert E. Wendrich 2024).

A special thanks and sincere appreciation to our past chair Dr. Caterina Rizzi (University of Bergamo) and honors and award chair Dr. Paul Witherell (NIST) for their efforts, dedication and services to our CIE division. This year they acted as chairs of the ASME IDETC-CIE 2024 Conference Organizing Committee.

We would also like to send our sincere gratitude to the division's volunteers, including members of the five TCs, symposium organizers, and paper reviewers, for making the 2024 CIE Conference a success.

Thank you for taking the time to read our newsletter. In this newsletter you will find many of the activities, events and accomplishments of our CIE division. If you are not already a volunteer, please consider becoming active in our CIE division in the coming years.

One of our main strategic goals going forward is to increase membership and volunteering in our CIE division. We have realized that many of you who have contributed to our division over the years may not have recently updated your division affiliation and actual professional information with ASME. So please take a moment to visit the ASME website, log into your account, and ensure that CIE is listed as your primary division and next include (update) your latest professional information.

Of course, we would also like new ASME members to join our CIE division and would like to actively recruit young engineers and students. As a CIE division member, we would like to seek your help in promoting the division and recruiting new members. In addition to increasing our membership, we would like to encourage our current members to become more actively involved in our CIE division's activities. One way to do that is to join one of our TCs and become involved in paper reviewing for our conference. At the next conference, please consider stopping by at one of our TC meetings.

Please feel free to contact either the Executive Committee members or TC leaders for any suggestions you may have in helping us grow our CIE division.

In the 2024 IDETC-CIE Conference, there were 145 papers (FPs / TPs) submitted, out of which 130 were accepted including 27 technical presentations only. These papers were presented in 27 sessions within five technical topics and joint-topic solicitations.

The 2024 CIE Conference featured three excellent KNs. Dr. Michael Grieves (Digital Twin Institute), Ken Leisenring (Ford Motor Company) and Mike Molnar (National Institute of Standards and Technology / Manufacturing USA), addressed the audiences with enticing and thought-provoking presentations. Dr. Grieves held his keynote on "Digital Twins-The Underlying Premise of Product Lifecycle Management". Mr. Leisenring conversed on "Democratizing Optimization and Anomaly Detection in Product Development" during his keynote address. We welcomed again this year Mike Molnar as one of our keynote speakers. Mike presented on "Convening Ecosystems for U.S. Global Leadership in Advanced Manufacturing" and laid out the future vision, mission and scope for Manufacturing USA.

In addition, at the CIE Awards Luncheon, several division awards and best paper awards were presented. I would like to highlight two in particular; Dr. SK Gupta received the CIE Lifetime Achievement Award, the most prestigious award that the CIE division upholds. Dr. Michael Grieves received the CIE Leadership award for his leadership role and outstanding performance in one or more areas of

concern to both the computer industry and the various engineering fields.

Next to this, our CIE community organized several panels on Human-Robot Collaboration, JCISE Spotlight Talks on Industry 5.0 and the fourth annual CIE Student Hackathon. This year CIE organized the inaugural Science Tech Buzz (STB) Summit, entitled: 'Why Creativity Matters In Science'. The Graduate Student Poster Session was an integral part of the STB event this year. Further down in this newsletter, you can read more on the How and What of the STB Summit and your participation and presentation in next year's event.

Effective July 1st, the new Executive Committee members are: Chair: Robert E. Wendrich, Vice Chair: Krishnanand Kaipa, Program Chair: John Steuben, Secretary: Xiaozhi (Christina) Wang and Gaurav Ameta will join the executive committee this year as the member-at-large. Marc Halpern, Vice President, Research, Manufacturing Advisory Services, Gartner Inc, will continue to be our Industry Executive liaison. Our past chair, Caterina Rizzi, is now the chair of the Honors and Awards Committee.

Our CIE Awards program has been very successful in highlighting the achievements of our members, but we need your help in identifying deserving colleagues. Caterina Rizzi (caterina.rizzi@unibg.it) will serve as our Honors and Awards Chair this year. Please contact her with nominations and questions.

More information about the activities of our CIE division can be found at:
https://event.asme.org/IDETC-CIE

Moreover, one example of volunteering is your help on the organization of the annual CIE Conference at IDETC/CIE in August 2025-2026 and the annual IMECE conference in November 2025-2026. We constantly seek symposium organizers and paper reviewers. Please mark your calendar for the 45th IDETC-CIE Conference which will be held in Anaheim, California, August 17-20, 2025. We look forward to seeing and welcoming you to the Hilton in Anaheim.

On behalf of the division's Executive Committee, I would like to send our new year greetings and best wishes to all members of the CIE community.

Robert E. Wendrich

CEO Rawshaping Technology, Research & Innovation, the Netherlands

Chair, Computers and Information in Engineering Division of ASM

CIE 2024 CONFERENCE REPORT NOTES FROM PAST CHAIR

CATERINA RIZZI

Congratulations to the symposium organizers, technical leadership committees, track chairs, reviewers and volunteers! The conference in Washington was a great success. The ASME CIE continues to grow, and our community is becoming increasingly stronger and more vibrant. This year we offered five technical tracks and a new event, the Science Tech Buzz, and it was great to see the response!

We sincerely thank Michael Grieves from the Digital Twin Institute, Ken Leisenring from Ford Motor Company, and Mike Molnar from NIST/Manufacturing USA for their insightful and engaging keynote presentations.

Special thanks to the ASME staff, Andy Koleba, and Barbara Zlatnik for their invaluable support, and to Stacey Cooper for assisting us all in completing our publications successfully.

This year, Paul and I have had the honor of serving as Conference Chairs for the ASME IDETC-CIE conferences. It has been a truly rewarding experience, and we hope everyone took advantage of the opportunity to connect with the larger DED and CIE communities through the various events planned.

As the CIE awards chair for 2024-2025, I would like to inform all of you that CIE is seeking nominations for the following division-level awards:

- *Young Engineer Award*: to recognize a promising young investigator who is making outstanding contributions to the progress in the application of computers in engineering.

- *Lifetime Achievement Award*: to recognize a person who has had a significant impact on the use of computers in engineering practice and/or education.

- *Leadership Award*: to recognize outstanding performance in one or more areas of concern to both the computer industry and the various engineering fields.

- *Excellence in Research*: CIE recognizes a person for outstanding research contributions in any field associated with the use of computers in engineering.

- *Distinguished Service Award*: to recognize a person for dedicated service in support of the CIE Division's mission.

- *Best Ph.D. Thesis/Dissertation Award*: to recognize promising young investigators who authored the best Ph.D. thesis of the year in CIE.

Details about the awards are available at: https://www.asme.org/get-involved/groups-sections-and-technical-divisions/technical-divisions/technical-divisions-community-pages/computers-information-in-engineering. The award nominations are due on May 01, 2024.

Please do not hesitate to contact me (email: caterina.rizzi@unibg.it) if you have any questions about the nomination.

We look forward to welcoming the ASME CIE community to another exceptional conference in Anaheim, California, USA. Join us for IDETC-CIE 2025 | International Design Engineering Technical Conferences, taking place August 17-20, 2025.

Caterina Rizzi, CIE Division Chair, 2023-2024

DIVISION HONORS AND AWARDS

CIE Division's honors and awards were conferred during the annual CIE conference, which took place in Washington, DC, USA.

2024 CIE LIFETIME AWARD

IN RECOGNITION OF SIGNIFICANT IMPACT ON THE USE OF COMPUTERS AND INFORMATION IN ENGINEERING PRACTICE AND/OR EDUCATION.

SK GUPTA
UNIVERSITY OF SOUTHERN CALIFORNIA

NOMINATORS: RAM SIRAM

2024 CIE LEADERSHIP AWARD

IN RECOGNITION OF OUTSTANDING LEADERSHIP FOR THE COMPUTERS AND INFORMATION IN ENGINEERING DIVISION OF ASME

MICHAEL GRIEVES
DIGITAL TWIN INSTITUTE

NOMINATOR: PAUL WITHERELL

2024 CIE EXCELLENCE IN RESEARCH AWARD

IN RECOGNITION OF OUTSTANDING RESEARCH CONTRIBUTIONS IN ANY FIELD ASSOCIATED IN THE DISCIPLINE OF COMPUTERS AND INFORMATION IN ENGINEERING

KRISHNAN SURESH
UNIVERSITY OF WISCONSIN - MADISON

NOMINATORS: DARRYL THELEN

2024 CIE YOUNG ENGINEER AWARD

IN RECOGNITION OF A PROMISING YOUNG INVESTIGATOR WHO IS MAKING OUTSTANDING CONTRIBUTIONS TO THE PROGRESS IN THE APPLICATION OF COMPUTERS AND INFORMATION IN ENGINEERING.

CHENANG LIU
OKLAHOMA STATE UNIVERSITY

NOMINATORS: ZHENYU (JAMES) KONG

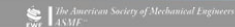## 2024 CIE BEST DISSERTATION AWARD

IN RECOGNITION OF THE BEST PH.D. DISSERTATION OF THE YEAR IN THE AREA OF COMPUTERS AND INFORMATION IN ENGINEERING, ENTITLED "HIGHER-ORDER GRAPH REINFORCEMENT LEARNING FOR MULTI-AGENT SYSTEMS AND PHYSICAL NETWORKS"
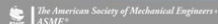
STEVE PAUL

NOMINATOR: SOUMA CHOWDHURY

2024 CIE DISTINGUISHED SERVICE AWARD

IN RECOGNITION OF DISTINGUISHED AND DEDICATED SERVICE IN SUPPORT OF THE COMPUTERS AND INFORMATION IN ENGINEERING DIVISION/'S OF ASME.

CATERINA RIZZI
UNIVERSITY OF BERGAMO, ITALY

NOMINATOR: PAUL WITHERELL

2024 CIE CONFERENCE CHAIR

IN APPRECIATION OF SERVICE TO COMPUTER AND INFORMATION IN ENGINEERING CONFERENCE AS 2024 TECHNICAL PROGRAM CHAIR

ROBERT E. WENDRICH
RAWSHAPING TECHNOLOGY INNOVATION & RESEARCH RBSO, THE NETHERLANDS

2024 CIE PROGRAM CHAIR

IN APPRECIATION OF SERVICE TO COMPUTER AND INFORMATION IN ENGINEERING CONFERENCE AS 2024 PROGRAM CHAIR

KRISHNANAND KAIPA
OLD DOMINION UNIVERSITY

2024 TC LEADERSHIP

AMS — Ahn Tran
CAPPD — Jida Huang

IN APPRECIATION OF OUTSTANDING LEADERSHIP IN TECHNICAL AREAS OF THE CIE DIVISION

SEIKM — Hyunwoong Ko
VES — Yunbo 'Will' Zhang
AIML — John Steuben

2024 CIE BEST PAPER AWARD

CHRISTOPHER-DENNY MATTE, TSZ HO KWOK

IDETC/CIE 142130

MODELING ELASTIC CABLE-SURFACE FRICTION FOR SOFT ROBOTS

2024 AMS BEST PAPER AWARD

MUTAHAR SAFDAR, JIARUI XIE, ANDREI MIRCEA AND YAOYAO FIONA ZHAO

IDETC/CIE 142857

HUMAN-ARTIFICIAL INTELLIGENCE TEAMING FOR SCIENTIFIC INFORMATION EXTRACTION FROM DATA-DRIVEN ADDITIVE MANUFACTURING RESEARCH USING LARGE LANGUAGE MODELS

2024 CAPPD BEST PAPER AWARD

MARIANA FRANCO OCHOA, YESSIKA MARÍA ORTEGA BEDOYA, AND ELIZABETH RENDÓN VELEZ

IDETC/CIE 140648

KINEMATIC ANALYSIS OF GAIT ON LEVEL AND SLOPING GROUND WITH UNEVEN SURFACE IN TRANSTIBIAL AMPUTEES WITH EXOMODULAR PROSTHESES
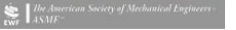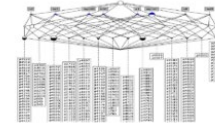
2024 SEIKM BEST PAPER AWARD

YANDE NDIAYE, ZHUO YANG, YAN LU, MARIO LEZOCHE, AND HERVE PANETTO

IDETC/CIE 146374

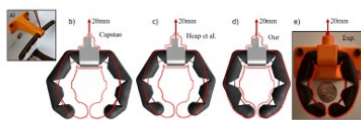KNOWLEDGE EXTRACTION IN ADDITIVE MANUFACTURING: A FORMAL CONCEPT ANALYSIS APPROACH

2024 VES BEST PAPER AWARD

CARLOS D. SALAZAR, AND RAUL G. LONGORIA

IDETC/CIE 145652

COMPARATIVE ANALYSIS OF REAL-TIME AND SIMULATED MONITORING TECHNIQUES FOR MIG WELDING
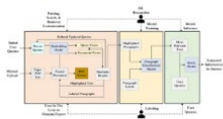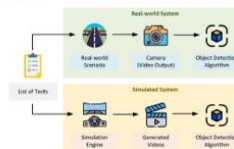
2024 AI/ML BEST PAPER AWARD

ROBERT J. SEIF, ZICHONG YANG, ZIRAN WANG, LAURA FREEMAN, AND JITESH H. PANCHAL

IDETC/CIE 143614

A MULTI-FIDELITY APPROACH TO TESTING AND EVALUATION OF AI-ENABLED SYSTEMS

2024 STUDENT POSTER STIPENDS

Mohammad Abu-Mualla - Inverse Design of Material Symmetry Inspired Cellular Materials

Athul Chakkithara Dharmarajan - Expertise in Engineering Design: Predictive Modeling Framework for Performance

Fatemeh Elhambakhsh - Diffusion Modeling Based Causal Data Fusion for Predictive Additive Manufacturing Digital Twins

Krstian Dalland - Predicting Human Workload During Context-Aware Action Modifications for AI Assistance and Imitation Learning

Suk Ki Lee - AM Transformer: A Koopman Theory-based Transformer to Learn Additive Manufacturing Dynamics

Morten Hejlskov Hansen - Three-Dimensional Visualization of Energy Consumption Data in Additive Manufacturing

One Chang Kim - A Study on Digital Human Modeling for Metaverse Factory

Min Woo - Deep generative model based inverse design of broadband acoustic metamaterials via latent space exploration

Siyi Xiao - Topic evolution: Insights from Five Years of IDETC Conference Papers

Fatemeh Mozaffar - Harmonizing AI and Humans in Manufacturing: Exploring the Potential of Music as a Medium for Communication

Sungmo Goo - A Field-Driven Computer-Aided Design System for Additive Manufacturing and its Implementation to Additive-Subtractive Hybrid Manufacturing

ASME 2024 TECHNICAL COMMITTEE REPORT

ADVANCED MODELING AND SIMULATION (AMS)

ANH TRAN

AMS Symposium Overview
The Advanced Modeling and Simulation (AMS) Symposium provides a platform for researchers to present cutting-edge developments in modeling and simulation, including:

- Theoretical advancements in engineering modeling and simulation
- Innovations in finite element methodology and numerical techniques
- Advances in numerical analysis and efficient computational implementations
- Industrial applications of modeling and simulation.
For 2024, a total of 39 papers were accepted across 8 sessions, organized in collaboration with AMS:

- **CIE AMS/CAPPD:** Digital Twin: Advanced Human Modeling and Simulation in Engineering (5 papers, 2 sessions)

- **CIE AMS/CAPPD/SEIKM:** Design, Simulation, and Optimization for Additive Manufacturing (8 papers, 2 sessions)

- **CIE SEIKM/AMS:** Artificial Intelligence and Machine Learning in Design and Manufacturing (12 papers, 2 sessions)

- **CIE AMS/SEIKM:** Physics-Informed Machine Learning for Design and Advanced Manufacturing (14 papers, 2 sessions)

The symposium featured a diverse range of topics, from state-of-the-art machine learning techniques to advanced engineering applications, with a particular focus on advanced manufacturing and physics-informed machine learning.

2024 AMS Symposium Topics

Highlighted Sessions:

- **AMS General (CIE-01):**
  - A broad collection of topics in modeling and simulation beyond specialized sessions.

- **Inverse Problems in Science & Engineering (CIE-02):**
  - Discussed methods for solving inverse problems, including pure inverse methods and optimization-based approaches.
  - Topics included regularization techniques and optimization algorithms.

- **Computational Multiphysics Applications (CIE-03):**
  - Focused on multi-physics simulation, optimization methods, and reduced-order modeling in computational fluid dynamics.

- **Uncertainty Quantification & Model Validation (CIE-04):**
  - Explored probabilistic machine learning for high-dimensional problems.
  - Topics included dimensionality reduction, Bayesian optimization, and applications in materials design.

- **Simulation in Advanced Manufacturing (CIE-05):**
  - Examined applications of digital human modeling in industry, military, and clinical practice.

- **Material Characterization Methods & Applications (CIE-06):**
  - Covered high-resolution material characterization techniques for improved simulation accuracy.

- Digital Twin: Advanced Human Modeling & Simulation (CIE-21 AMS/CAPPD):
  - Highlighted simulation techniques for additive manufacturing, patient-specific modeling, and machine learning applications.

- Physics-Informed Machine Learning & AI in Design & Manufacturing (CIE- 23 AMS/SEIKM & CIE-24 SEIKM/AMS):
  - Explored cutting-edge physics-informed and physics-constrained scientific machine learning techniques.

Graduate Student Poster Session

AMS contributed several graduate student posters to the CIE Student Poster Session, featuring 8 submissions from 5 institutions. The session facilitated interactive discussions between presenters and attendees.

2024 AMS Hackathon

AMS TC, in collaboration with SEIKM TC, co-organized another successful annual hackathon. Details about CIE Hackathon can be found in the following Session of ASME 2024 STUDENT HACKATHON.

2025 AMS TC Leadership

Chair:

- James Yang, Texas Tech University (james.yang@ttu.edu)
- Ashish Chaudhari, MIT (amchaudhari@mit.edu)

Vice-Chair:

- Dehao Liu, Binghamton University (dehaoliu@binghamton.edu)
- Mike Xiang, Oklahoma State University (yujiang.xiang@okstate.edu)

Secretary:

- Sandippkrishnan Ravi, General Electric Research (sandippkrishnan.ravi@ge.com)

Members-at-Large:

- Lisha White, Postdoctoral Researcher, NIST (lisha.white@nist.gov)
- Yanglong Lu, Assistant Professor, HKUST (maeylu@ust.hk)

This newsletter provides an overview of AMS's contributions, achievements, and leadership for 2024.

We look forward to another year of groundbreaking research and collaboration in advanced modeling and simulation!

COMPUTER-AIDED PRODUCT AND PROCESS DEVELOPMENT (CAPPD)

JIDA HUANG

As part of the 2024 CIE conference, CAPPD organized six symposia: 1) CAPPD general, 2) Human-in-the loop product design and automation, 3) Digital Human Modelling for Design and Manufacturing, 4) Product and Process Design Automation for Industry 4.0, 5) Data-Driven Product Design and Fabrication.

In total, 36 draft papers were submitted to CAPPD and 30 were accepted, corresponding to an acceptance rate of 83.3%.

As in the past, the CAPPD technical committee continued to organize the CIE Graduate Student Poster Session. Thanks to the outstanding efforts of the CAPPD secretary, Satchit Ramnath, this year's poster session drew 11 poster submissions from 10 different institutes in the United States, all of them were selected with CIE travel award and all of them presented at the conference.

As in the past, the CAPPD technical committee continued to organize the CIE Graduate Student Poster Session. Thanks to the outstanding efforts of the CAPPD secretary, Satchit Ramnath, this year's poster session drew 11 poster submissions from 10 different institutes in the United States, all of them were selected with CIE travel award and all of them presented at the conference.

2024-2025 CAPPD TC LEADERSHIP

Chair: Jun Wang, Santa Clara University (jwang22@scu.edu)

Vice Chair: Satchit Ramnath, Clemson University (sramnat@clemson.edu)

Secretary: Guoxin Fang, Chinese University of Hong Kong, guoxinfang@mae.cuhk.edu.hk

Member-at-large 1: Cheng Chen, University of Alabama in Huntsville, cc1115@uah.edu

Member-at-large 2: Hemanth Manjunatha, Oklahoma State University, hemanth.manjunatha@okstate.edu

Past Chair: Jida Huang, University of Illinois at Chicago (jida@uic.edu)

SYSTEMS ENGINEERING, INFORMATION AND KNOWLEDGE MANAGEMENT (SEIKM)

HYUNWOONG KO

SEIKM Overview and Topics

The goal of the Systems Engineering, Information, and Knowledge Management (SEIKM) Technical Committee (TC) has been twofold: (i) to serve the SEIKM community in the broader computer and information engineering field by promoting the dissemination of new knowledge and technology and (ii) to advance research related to the design, engineering, and operation of complex systems where connectivity, uncertainty, knowledge discovery, and management present unique challenges.

With the increasing interest in IoT, big data, machine learning & AI, cyber-physical systems, digital twin technology, and sociotechnical systems, our community has had significant opportunities to make a collaborative research impact. Over the past year, SEIKM TC has initiated several efforts to support both academia and industry, including the ASME-CIE Hackathon event.

For the CIE 2024 conference, SEIKM TC organized and co-organized ten sessions:

- Design, Simulation, and Optimization for Additive Manufacturing (AMS/CAPPD/SEIKM)

- Physics-Informed Machine Learning for Advanced Manufacturing and Design (AMS/SEIKM)
- AI and Machine Learning in Design and Manufacturing (AMS/SEIKM)
- SEIKM General
- Design Informatics
- Systems Engineering and Complex Systems
- Smart Manufacturing Informatics
- Advanced Manufacturing for Bioeconomy and Circular Economy
- Knowledge Capture, Reuse, and Management
- Systems Engineering and Complex Systems

A total of 55 presentations were delivered for 46 accepted papers and 9 accepted abstracts in these sessions.

2024 ASME-CIE Hackathon

SEIKM and AMS co-organized the 2024 ASME-CIE Hackathon. Details about CIE Hackathon can be found in the following Session of ASME 2024 STUDENT HACKATHON.

2025 SEIKM TC LEADERSHIP

- TC Chair: Shengyen Li (shengyen.li@nist.gov)
- Program Chair: Abheek Chatterjee (achatt31@umd.edu)
- Secretary: Farhad Imani (farhad.imani@uconn.edu)
- Past Chair: Hyunwoong Ko, Arizona State University (hyunwoong.ko@asu.edu)

SEIKM appreciates everyone's contributions and looks forward to even greater participation, research, and collaboration in future events.

VIRTUAL ENVIRONMENTS & SYSTEMS (VES)

YUNBO "WILL" ZHANG

At the 2024 CIE Conference, the VES Technical Committee organized three symposia including:

- User Experience (UX) Design for Virtual Environments,
- Virtual Systems for Engineering, Healthcare, and Education,
- AR/VR for Manufacturing Systems, Hardware, and Accessibility.

and two special sessions including:

- JCISE Spotlight Talks on Human-Robot Collaboration in Industry 5.0,
- Panel: VES for Human-Robot Collaboration – Understanding, Communication, and Trust between Humans and Robots.

In 2024, 19 draft papers were submitted to VES, and 15 were accepted, resulting in an acceptance rate of 78.9%. Special thanks to the session chairs for organizing the review process and presentations:

- Rebecca Friesen (Texas A&M University),
- Junfeng Ma (Mississippi State University),
- Jinjuan She (Miami University),
- Chih-Hsing Chu (National Tsing Hua University).

Panel Topic: VES for Human-robot Collaboration – Understanding, Communication, and Trust between Humans and Robots

Invited panelists:

Dr. Satyandra K. Gupta, Professor at University of Southern California, Co-Founder and Chief Scientist at GrayMatter Robotics, USA.

Dr. Irene Fassi, Research Director at CNR-STIIMA, Italy.

Dr. Chih-Hsing Chu, Professor at National Tsing Hua University, Taiwan.

The discussed topics were:

- Definition & Principle of HRC
- Applications of HRC
- Techniques and Methods for HRC
- Education & Workforce Development for HRC
- Limitation & Future Direction for HRC

2024-2025 VES TC LEADERSHIP

Chair: Marco Rossoni, Politecnico di Milano, Italy (marco.rossoni@polimi.it)

Vice Chair: Tsz-Ho Kwok, Concordia University, Canada (tszho.kwok@concordia.ca)

Secretary: Pietro Piazzolla, Politecnico di Milano, Italy (pietro.piazzolla@polimi.it)

Member-at-large: Wenhao Yang, Lamar University, USA (wyang2@lamar.edu)

Past Chair: Yunbo "WILL" Zhang, Rochester Institute of Technology, USA (ywzeie@rit.edu)

AI AND ML IN ENGINEERING (AI/ML)

JOHN STEUBEN

The Artificial Intelligence and Machine Learning in Engineering (AI/ML) Technical Committee made its debut at the 2024 CIE conference. As this was the initial year, the committee organized a single symposium, the AI/ML General Session. Due to high interest, the quality of submitted abstracts/papers, and excellent peer reviews, this inaugural symposium was a success. 17 total submissions were made, 13 of which were technical papers. 11 of the 13 papers were accepted, corresponding to an 85% acceptance ratio. Excitingly, of all 2024 CIE registrants, nearly 50% selected AI/ML as the TC they were most interested in.

2025 AI/ML Symposia

As a result of the broad interest that the CIE community has expressed in AI and ML topics, the TC will greatly expand the number of symposia under its purview for the 2025 conference. These symposia will include:

1. **AI/ML General Session:** This session is seeking papers and presentations addressing emerging uses of AI and ML technologies within the domain of engineering. Papers addressing the development of new AI/ML techniques for engineering problems are encouraged, as are papers demonstrating the application of existing AI/ML techniques to novel engineering problems. Additional topics of interest for this session include identifying improved training data sources, acquisition approaches, and improvements to data pre- and post-processing. Papers addressing the role of AI/ML in advanced manufacturing applications such as "Digital Twins" and Extended Reality interfaces are also encouraged. Papers on AI/ML topics not explicitly outlined elsewhere are sought for this session.

2. **AI/ML Data:** This session is broadly focused on the various aspects of data in AI and ML. It is intended to provide a forum for discussion of data-driven AI and ML methods, with a focus on the data used. Topics of interest include, but are not limited to, engineering domain-specific data sources for AI/ML, training data management and curation technologies, the generation and use of synthetic training datasets, and benchmarking data. The management, curation, and traceability of data in the AI/ML domain are also relevant topics. Papers and presentations addressing aspects of data security, privacy, and equity are also encouraged.

3. **Knowledge-Informed AI and ML for Engineering:** The session invites papers and presentations on AI/ML approaches that integrate domain knowledge, such as physics and engineering principles, with data-driven methods to enhance knowledge evolvement in AI/ML model development for advanced engineering. Traditional black-box models, which learn solely from data, often lack transparency and reliability, particularly when applied to complex or unseen situations. In contrast, knowledge-informed

models fuse data-driven insights with a priori principles, such as physical laws or engineering constraints. For example, physics-informed neural networks (PINNs) integrate fundamental laws like the conservation of mass, energy, or momentum into the learning process, combining first principles with data-driven knowledge to guide the model. Similarly, explaining models using physics or principle-based knowledge can help reduce reliance on purely empirical data. These approaches not only enhance the model's interpretability but also ensure more reliable predictions and iterative knowledge evolvement in AI and ML for engineering applications. This synergistic approach improves accuracy, generalization, and interpretability. Submissions on new methodologies, real-world applications, and novel data processing techniques that leverage both data-driven knowledge and priori principles to advance AI/ML in engineering are encouraged.

4. **AI-Driven Innovation and Discovery with Vision and Imaging:** This session focuses on the innovative integration of imaging technologies and artificial intelligence (AI), with particular attention to recent advancements in computer vision, 3D modeling, and specialized intelligence systems. We invite papers that explore best practices for applying these technologies across various domains, including engineering design, manufacturing, healthcare, and other complex systems. Submissions should emphasize how AI and machine learning (ML) are transforming image analysis and interpretation, highlighting novel methodologies, frameworks, or tools.

5. **Generative AI and Large Language Model (LLM) for Engineering:** This session explores the transformative impact of Generative AI and Large Language Models (LLMs) on engineering. We invite submissions focusing on the development and adaptation of generative AI and LLMs for domain-specific engineering challenges, including advanced design, manufacturing, and foundational modeling technologies. Topics of interest include LLM-driven design optimization, process automation,

natural language interfaces for engineering software such as CAD/CAM, AI-assisted engineering analysis, materials discovery, and advanced manufacturing applications like process optimization, predictive maintenance, quality control, and supply chain management. We strongly encourage submissions showcasing real-world applications of LLMs in mechanical engineering and other diverse disciplines such as aerospace, civil, electrical, chemical, and biomedical engineering. Case studies demonstrating the impact of these technologies on industry practices are highly valued.

2025 AI/ML Panel

In addition to these symposia, the AI/ML TC will also host a panel session, on the topic of physics-informed AI and ML approaches, at the 2025 CIE conference.

2024/2025 AI/ML TC Leadership:

At the 2024 CIE conference, the AI/ML TC held it's first election of officers. By a unanimous vote, an new Vice-chair, Secretary, and Member-at-Large were elected. The resultant TC leadership is:

1) Past-chair – John Steuben [U.S. Naval Research Laboratory] <john.c.steuben.civ@us.navy.mil>

2) Chair – Zhengui Sha [University of Texas] <zsha@austin.utexas.edu>

3) Vice-Chair – Ashly Joseph [Cisco Systems] <ashlyelsy@gmail.com>

4) Secretary – Hyunwoong Ko [Arizona State University] <Hyunwoong.Ko@asu.edu>

Member-at-Large – Anna Ghidotti [University of Bergamo] <anna.ghidotti@unibg.it>

ASME 2024 STUDENT HACKATHON

The Computer & Information in Engineering (CIE) Division of the American Society of Mechanical Engineers (ASME) held past hackathon events at the IDETC/CIE 2020, 2021, 2022, 2023 Conferences. These hackathon events provide students and engineering practitioners with a unique opportunity to learn how data science and machine learning techniques can be leveraged to solve real-world engineering problems.

Given the previous resounding successes, the CIE Division will hold the ASME-CIE Hackathon again at the IDETC/CIE 2024 Conference in hybrid settings, both virtual and on-site, as a pre-conference event from Aug. 18-25, 2024.

The ASME2024 student hackathon was focused on Harnessing Artificial Intelligence to Enhance Mechanical Engineering. There were two challenges:

Problem 1 from National Instituted of Standards and Technology (NIST) centers on developing innovative methods to accurately locate these missing frames within melt pool monitoring (MPM) image sequences. Participants are invited to tackle this issue in two parts: the first assumes missing images can be re-identified without their original sequence, while the second deals with scenarios where the missing frames are irretrievably lost. Solutions will be assessed based on accuracy, creativity, and clarity, with results evaluated after a week.

Problem 2 is based on Exploring the AFRL FactoryNet Dataset.The challenge presented is to organize/consolidate freeform labels and create classifiers that show the image recognition capabilities enabled by this dataset. Participants should aim to sanitize and propose structure to the image label data in an intuitive hierarchy that can enable image classification. Post-organization the participants should aim to show that classes yielded are useful and accurate by demonstrating they provide enough information to train and validate a classification model.

Award list:

NIST problem

First Place: Zichong Yang & Yanwen Wang - Purdue University

Second Place: Danny Hoang & Sean Rescsanski - University of Connecticut

Third Place: Harsh Singh - Michigan Technological University

FactoryNet problem

First Place: Mutahar Safdar & William Jabbour - McGill University

Second Place: Nazanin Mahjourian - Michigan Tech University

Third Place: Rahul Pushparajan - Arizona State University

POSTER SESSION AND AWARDS

SATCHIT RAMNATH

The ASME-CIE Graduate Research Poster session is an opportunity for graduate students in the preliminary phase of their research programs (MS or within 2 years of starting a PhD) to present their current work to the CIE research community. This session provides the students with a chance to obtain external feedback on their preliminary research that may not yet be ready for presentation at the conference in archival form.

This year (IDETC-CIE 2024), the CIE division supported 11 poster submissions from 10 Universities to participate in the CIE Graduate Poster Session. The 2023 CIE poster session awardees are listed in the following:

1 Paper No. 147053 "Inverse Design of Material Symmetry Inspired Cellular Materials" by Mohammad Abu-Mualla, University of Illinois Chicago. Advisor - Jida Huang

2 Paper No. 148314 "Expertise in Engineering Design: A Predictive Modeling Framework for

Performance" by Athul Chakkithara Dharmarajan, Purdue University. Advisor - Jitesh Panchal

3 Paper No. 148478 "Diffusion Modeling Based Causal Data Fusion for Predictive Additive Manufacturing Digital Twins" by Fatemeh Elhambakhsh, Arizona State University. Advisor - Hyunwoong Ko

4 Paper No. 148429 "Predictng Human Workload During Context-Aware ActonModificatons for AI Assistance and Imitaton Learning" by Kristian Dalland, University of Buffalo. Advisor - Ehsan T. Esfahani

5 Paper No. 148505 "AM Transformer: A Koopman Theory-based Transformer to Learn Additive Manufacturing Dynamics" by Suk Ki Lee, Arizona State University. Advisor - Hyunwoong Ko

6 Paper No. 148165 "Three-Dimensional Visualization of Energy Consumption Data in Additive Manufacturing" by Morten Hejlskov Hansen, Aarhus University. Advisor - Devarajan Ramanujan

7 Paper No. 147983 "A Study on Digital Human Modeling for Metaverse Factory" by One Chang Kim, SungKyunKwan University. Advisor - Sang Won Lee

8 Paper No. 142254 "Deep Generative Modelbased Inverse Design of Broadband Acoustic Metamaterials Via Latent Space Exploration" by Min Woo, Pusan National University. Advisor - Sang Min Park

9 Paper No. 148189 "Topic evolution: Insights from Five Years of IDETC Conference Papers" by Siyi Xiao, Texas A&M University. Advisor - Daniel McAdams

10 Paper No. 148487 "Harmonizing AI and Humans in Manufacturing: Exploring the Potential of Music as a Medium for Communication" by Fatemeh Mozaffar, University of Georgia. Advisor - Beshoy Morkos

11 Paper No. 148441 "A Field-Driven Computer-Aided Design System For Additive Manufacturing and Its Implementation to Additive Subtractive Hybrid Manufacturing" by Sungmo Goo, Incheon National University. Advisor - Sang-in Park

ScienceTechBuzz

ROBERT E. WENDRICH

SciTechBuzz (STB) Summit 20241: 'Why Creativity in Science Matters'

This novel and exciting event took place during the ASME IDETC-CIE 2024 conference. Participants were invited to participate in high-speed ideation and iteration through lively and dynamic Pecha-Kucha (PK) style presentations. This to engage and immerse yourself in cutting-edge concepts that awe, inspire, and spark conversations in the CIE and conference attendee community. Generate fresh ideas to invigorate underutilized areas and foster community connections. Embrace an asset mindset – as opposed to a deficit mindset – within your community.

The STB Summit attracted more than 84 people, 55 were speakers/authors in general and 29 were students, both as participants and/or audience. This year we decided to hand out four awards (see Appendix III); the PK Killer Award; the Buzz Award; the Innovation Award and the Sci Rising Star Award.

STB 2024 Summit WINNERS | PechKucha Presentations:

PK Killer Award - Wesley Honeycutt, Oklahoma University, OK, USA

Buzz Award - John Morris, Clemson University, SC, USA

Innovation Award - Athul Chakkithara Dharmarajan, Purdue University, IN, USA

Sci Rising Star Award - Fatemeh Mozaffar, Georgia University, GA, USA

Honorable Mention:

Sukki Lee, Korea Advanced Institute of Science and Technology (KAIST), Republic of Korea

Fatemeh Elhambakhsh - Arizona State University, AZ, USA

Jinwoo Bae, Rutgers University, NJ, USA

UPDATES FROM ASME JOURNAL OF COMPUTING AND INFORMATION SCIENCE IN ENGINEERING (JCISE)

YAN WANG, EDITOR, JCISE

Overview

The Journal of Computing and Information Science in Engineering (JCISE) publishes articles related to scientific computing methods (e.g., modeling, simulation, representation, algorithm) and computational tools (e.g., high-performance computing, virtual and augmented reality) that aim to improve engineering products and systems for their complete lifecycle (e.g., design, manufacturing, operation, maintenance, disposal, and recycling). The target audience and application areas for JCISE are mainly in mechanical and other related engineering disciplines. JCISE emphasizes new modeling and computational methodologies.

The twelve thrust areas are computer-aided design and manufacturing, computational geometry & geometry processing, cyber-physical-social systems, data analytics & machine learning, engineering optimization, human-computer interface & human modeling, intelligent manufacturing, machine intelligence & robotics system, modeling and simulation & scientific computing, precision engineering & reverse engineering, sustainability & product lifecycle management, and systems engineering & engineering informatics.

Associate Editors

Computer-Aided Design and Manufacturing

- Jonathan Roy Corney, Ph.D. (University of Edinburgh, UK)
- Kaushalkumar A. Desai, Ph.D. (Indian Institute of Technology Jodhpur, India)
- B. Gurumoorthy, Ph.D. (Indian Institute of Science, India)
- Alison Olechowski, Ph.D. (University of Toronto, Canada)
- P.V.M. Rao, Ph.D. (Indian Institute of Technology Delhi, India)
- Cameron J. Turner, Ph.D. (Clemson University, USA)

Computational Geometry & Geometry Processing

- Stephen Baek, Ph.D. (University of Virginia, USA)
- Ajay Joneja, Ph.D. (Hong Kong University of Science and Technology, Hong Kong)
- Vinayak R. Krishnamurthy, Ph.D. (Texas A&M University, USA)

Cyber-Physical-Social Systems

- Chih-Hsing Chu, Ph.D. (National Tsing Hua University, Taiwan)
- Dan Li, Ph.D. (University of Wisconsin-Madison, USA)
- Yan Lu, Ph.D. (National Institute of Standards and Technology, USA)

Data Analytics & Machine Learning

- Linkan Bian, Ph.D. (Mississippi State University, USA)
- Jianxi Luo, Ph.D. (City University of Hong Kong, Hong Kong)

- Hui Yang, Ph.D. (Pennsylvania State University, USA)
- Xiaowei Yue, Ph.D. (Tsinghua University, China)

Engineering Optimization

- Seung-Kyum Choi, Ph.D. (Georgia Institute of Technology, USA)
- Amir H. Gandomi, Ph.D. (University of Technology Sydney, Australia)
- Samy Missoum, Ph.D. (The University of Arizona, USA)
- Kazuhiro Saitou, Ph.D. (University of Michigan, USA)
- Yu Song, Ph.D. (Delft University of Technology, The Netherlands)

Human-Computer Interface & Human Modeling

- Francesco Ferrise, Ph.D. (Politecnico di Milano, Italy)
- Caterina Rizzi, Ph.D. (University of Bergamo, Italy)
- Shanna Smith, Ph.D. (National Taiwan University, Taiwan)

Intelligent Manufacturing

- Gaurav Ameta, Ph.D. (Siemens Corporate Technology, USA)
- Tsz-Ho Kwok, Ph.D. (Concordia University, Canada)
- Yayue Pan, Ph.D. (University of Illinois at Chicago, USA)
- Wenmeng Tian, Ph.D. (Mississippi State University, USA)
- Zhinan Zhang, Ph.D. (Shanghai Jiao Tong University, China)

Machine Intelligence & Robotics System

- Ehsan T. Esfahani, Ph.D. (State University of New York at Buffalo, USA)
- Krishnanand Kaipa, Ph.D. (Old Dominion University, USA)
- Atul Thakur, Ph.D. (Indian Institute of Technology Patna, India)

Modeling and Simulation & Scientific Computing

- Johann Guilleminot, Ph.D. (Duke University, USA)
- Guang Lin, Ph.D. (Purdue University, USA)
- John G. Michopoulos, Ph.D. (Naval Research Laboratory, USA)

Precision Engineering & Reverse Engineering

- Nabil Anwer, Ph.D. (Ecole Normale Superieure Paris-Sarclay, France)
- Jun Wang, Ph.D. (Nanjing University of Aeronautics and Astronautics, China)

Sustainability & Product Lifecycle Management

- William Bernstein, Ph.D. (Air Force Research Laboratory, USA)
- Bin He, Ph.D. (Shanghai University, China)

Systems Engineering & Engineering Informatics

- Yusheng Liu, Ph.D. (Zhejiang University, China)
- Yongsheng Ma, Ph.D. (Southern University of Science and Technology, China)
- Duhwan Mun, Ph.D. (Korea University, Korea)
- Douglas Van Bossuyt, Ph.D. (Naval Postgraduate School, USA)

Journal Statistics

Annual paper submissions: 617 (Year 2023)

Annual paper publications: 88 (Year 2022)

Impact Factor: 3.1

JCISE now publishes 12 issues per year.

Recent Special Issues

FEBRURAY 2023 Issue: *Machine Intelligence for Engineering Under Uncertainties*

(Guest Editors: Amir Gandomi, Marc Mignolet, Christian Soize, Yan Wang)

JUNE 2023 Issue: *Highlights of CIE 2022*

(Guest Editors: Mahesh Mani, Paul Witherell, Caterina Rizzi)

DECEMBER 2023 Issue: *Challenges and Opportunities in Computing Research to Enable Next-Generation Engineering Applications* (Position Papers)

(Guest Editors: SK Gupta, Janet K Allen, Ehsan Esfahani, B. Gurumoorthy, Bin He, Ying Liu, John Michopoulos, Jitesh Panchal, Anurag Purwar, Kristina Wärmefjord)

JANUARY 2024 Issue: *Machine Learning and Representation Issues in CAD/CAM*

(Guest Editors: Anurag Purwar, Kaushalkumar Desai, Stephen Canfield, Rahul Rai, Zhenguo Nie)

MARCH 2024 Issue: *Extended Reality in Design and Manufacturing*

(Guest Editors: Chih-Hsing Chu, Vinayak Krishnamurthy, William Bernstein, Yunbo Zhang, Junfeng Ma)

MAY 2024 Issue: *CIE 2023 Highlight*

(Guest Editors: Caterina Rizzi, Robert Wendrich, Krishnanand Kaipa, Paul Witherell, John Steuben)

JULY 2024 Issue: *Cybersecurity in Manufacturing*

(Guest Editors: Dan Li, Fan Zhang, Gaurav Ameta, Mark Yampolskiy, Satish Bukkapatnam, Wenmeng Tian)

NOVEMBER 2024 Issue: *Scientific Machine Learning for Manufacturing Processes and Material Systems*

(Guest Editors: Anindya Bhaduri, Francisco Chinesta, Elias Cueto, Dehao Liu, John Michopoulos, Sandipp Krishnan Ravi, Jian-Xun Wang)

FEBRUARY 2025 Issue: *Large Language Models in Design and Manufacturing*

(Guest Editors: Yaoyao Fiona Zhao, Evangelos Niforatos, Tonya Custis, Yan Lu, Jianxi Luo)

Over the next year, JCISE is planning the following special issues/sections:

Special Issue on Human-Robot Collaboration in Industry 5.0

(Guest Editors: Chih-Hsing Chu, Yunbo Zhang, Francesco Ferrise, Pai Zheng, Qing (Cindy) Chang)

Special Issue on Networks and Graphs for Engineering Systems and Design

(Guest Editors: Zhenghui Sha, Astrid Layton, Babak Heydari, Megan Konar, Douglas Van Bossuyt)

Special Issue on Geometric Data Processing and Analysis for Advanced Manufacturing

(Guest Editors: Bianca Maria Colosimo, Jonathan Corney, Chen Kan, Gregory W. Vogl, Yinan Wang)

Special Issue on Next-Generation Digital Supply Networks

(Guest Editors: Farhad Ameri, Thorsten Wuest, David Romero, Boonserm Kulvatunyou)

Recent Spotlight Talks

February 28, 2023 Spotlight Talk by Professor Charbel Farhat (Stanford University) on the article:

Marie-Jo Azzi, Chady Ghnatios, Philip Avery, and Charbel Farhat, "Acceleration of a Physics-Based Machine Learning Approach for Modeling and Quantifying Model-Form Uncertainties and Performing Model Updating," ASME *J. Comput. Inf. Sci. Eng.* Feb 2023, 23(1): 011009. doi: https://doi.org/10.1115/1.4055546

May 19, 2023 Spotlight Talk by Professor Mian Li (Shanghai Jiao Tong University) on article:

Xueke Zheng, Ying Wang, Le Wang, Runze Cai, Mian Li, and Yu Qiu, "Data-Driven Sensor Selection for Signal Estimation of Vertical Wheel Forces in Vehicles," ASME *J. Comput. Inf. Sci. Eng.* June 2023, 23(3): 031010. doi: https://doi.org/10.1115/1.4055514

July 14, 2023 Spotlight Talk by Professor Jianxi Luo (Singapore University of Technology & Design) on article:

Qihao Zhu and Jianxi Luo, "Generative Transformers for Design Concept Generation," ASME *J. Comput. Inf. Sci. Eng.* Aug 2023, 23(4): 041003. doi: https://doi.org/10.1115/1.4056220

July 21, 2023 Spotlight Talk by Dr. John G. Michopoulos (U.S. Naval Research Laboratory) on article:

John G. Michopoulos, Nicole A. Apetre, Athanasios P. Iliopoulos, and John C. Steuben, "Effects of Elastoplasticity, Damage, and Environmental Exposure on the Behavior of Adhesive Step-Lap Joints," ASME *J. Comput. Inf. Sci. Eng.* June 2023, 23(3): 030904. doi: https://doi.org/10.1115/1.4056361

June 18, 2024 Spotlight Talk by Professor Christian Soize (Université Gustave Eiffel) on article:

Evangéline Capiez-Lernout, Olivier Ezvan, Christian Soize, "Updating Nonlinear Stochastic Dynamics of an Uncertain Nozzle Model Using Probabilistic Learning with Partial Observability and Incomplete Dataset," *J. Comput. Inf. Sci. Eng.* June 2024, 24(6): 061006. doi: https://doi.org/10.1115/1.4065312

July 17, 2024 Spotlight Talk by Professor Jitesh Panchal (Purdue University) on article:

Karim A. ElSayed, Jitesh H. Panchal, "Information Embedding in Additively Manufactured Parts Through Printing Speed Control," *J. Comput. Inf. Sci. Eng.* Jul 2024, 24(7): 071005. doi: https://doi.org/10.1115/1.4065089

2024 Reviewers of the Year

Antoine Bordas — Mines Paris PSL, France

Hemanth Manjunatha — Oklahoma State University, USA

Binyang Song — Nanyang Technological University, Singapore

2024 Associate Editor Excellence Award

Chih-Hsing Chu — National Tsing Hua University, Taiwan

Jianxi Luo — City University of Hong Kong, Hong Kong

Atul Thakur — Indian Institute of Technology Patna, India

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45th ASME Computers and Information Engineering Conference (CIE) Call For Papers

https://event.asme.org/IDETC-CIE

The CIE Division is excited to put out a call for papers for the 45th CIE Conference, to be held on August 17-20, 2025 in Anaheim, California, USA. All CIE tracks are soliciting papers in all aspects of computer applications on experimental, numerical, or analytical studies, with emphasis on the highlighted topic areas.

Track Symposiums

▪ Advanced Modeling and Simulation (AMS)

▪ Computer-Aided Product and Process Development (CAPPD)

▪ Virtual Environments and Systems (VES)

▪ Systems Engineering Information Knowledge Management (SEIKM)

▪ Artificial Intelligence and Machine Learning (AI/ML)

Track Symposium Topics

▪ Advanced Modeling and Simulation (AMS General)

▪ Inverse Problems in Science and Engineering

▪ AMS: Computational Multiphysics Applications

▪ AMS: Uncertainty Quantification in Simulation and Model Verification & Validation

▪ AMS: Simulation in Advanced Manufacturing

▪ AMS: Material Characterization Methods and Applications

▪ Digital Twin: Advanced Human Modeling and Simulation in Engineering

▪ AMS/SEIKM Joint Topic: Physics-Informed Machine Learning for Design and Advanced Manufacturing

▪ AMS/SEIKM: Artificial Intelligence and Machine Learning in Design and Manufacturing

▪ AMS/CAPPD/SEIKM: Design, Simulation and Optimization for Additive Manufacturing

▪ Computer-Aided Product and Process Development (CAPPD General)

▪ Human-In-the Loop Product Design and Automation

▪ Digital Human Modelling for Design and Manufacturing

▪ Product and Process Design Automation for Industry 4.0

▪ Data-Driven Product Design and Fabrication

▪ Graduate Student Poster Symposium

▪ Systems Engineering Information Knowledge Management (SEIKM General)

▪ Design Informatics ▪ Systems Engineering and Complex Systems

▪ Smart Manufacturing Informatics

▪ Advanced Manufacturing for Bioeconomy and Circular Economy

▪ Digital Twin Modeling and Analytics for Advanced Manufacturing

▪ Physics-Informed Machine Learning for Advanced Design and Manufacturing

▪ Artificial Intelligence and Machine Learning in Design and Manufacturing

▪ Design, Simulation, and Optimization for Additive Manufacturing

▪ Smart Manufacturing Informatics

▪ Knowledge Capture, Reuse, and Management

▪ User Experience (UX) Design for Virtual Environments

▪ Virtual Systems for Engineering, Healthcare, And Education

▪ AR/VR for Manufacturing Systems

▪ VR/AR Hardware and Accessibility

▪ Industrial Metaverse for Supply Chain and Logistics

▪ JCISEe Spotlight Talks on xxxxxx

▪ Ves Show-And-Tell

▪ CIE-VES Panel

▪ AI/ML General Session

▪ AI/ML Best Practices & Data Management

▪ AI/ML Engineering-Informed Approaches

CONFERENCE ORGANIZERS:

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Dr. Krishnanand Kaipa

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Program Chair:

John Steuben

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Relevant Journals, Conferences & Journals

Journal of Computing and Information Science in Engineering

The Journal of Computing and Information Science in Engineering publishes archival research results and advanced technical applications. The scope includes: Solid and Geometric Modeling; Computational geometry; Reverse Engineering; Virtual Environments and Haptics; Tolerance Modeling and Computational Metrology; Rapid Prototyping; Internet-Aided Design, Manufacturing and Commerce; Information Models and Ontologies for Engineering Applications; PDM/Enterprise Information Management; AI/Knowledge Intensive CAD/CAM; Engineering Simulation and Visualization, including FEA and Meshing; Creative IT; and Computational Algorithms/Software Development for mechanical product development.

For further information see:
http://computingengineering.asmedigitalcollection.asme.org/journal.aspx

The International Mechanical Engineering Congress and Exposition (IMECE) is ASME's largest research and development conference focused primarily on mechanical engineering but encompasses perspectives from many engineering disciplines. As per the latest revision to our ASME Anywhere policy, the 2025 conferences will be held in person, November 16-20, 2025. At IMECE one can experience stimulating innovation from basic discovery to translational application of new approaches and foster collaborations that engage stakeholders and partners not only from academia but also from national laboratories, industry, and government funding bodies. For further information see: https://event.asme.org/IMECE

Founded in 1880 as the American Society of Mechanical Engineers, ASME is the premier professional membership organization for more than 127,000 mechanical engineers and associated members worldwide. ASME also conducts one of the world's largest technical publishing operations in the world, offering thousands of titles including some of the profession's most prestigious journals, conference proceedings, and ASME Press books.

The ASME Digital Collection, previously known as The ASME Digital Library, is ASME's repository of current and archival literature featuring:

ASME's Transaction Journals from 1960 to present.

ASME's Conference Proceedings from 2002 to present.

ASME Press eBooks selected from 1993 to present.
http://asmedigitalcollection.asme.org/index.aspx

laboratories, industry and government funding bodies. During last years, initiatives have been shared between CIE and IMECE communities.

For further information see:
https://event.asme.org/IMECE

CIE NEWSLETTER EDITORIAL

ISSUE EDITOR

Christina Wang

CONTRIBUTIONS

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Satchit Ramnat, Yang Wang

Computers & Information In Engineering

Computers and Information in Engineering Division (CIE) is a forum for understanding the application of emerging technologies that impact critical engineering issues of representation, product design and product development.

https://www.asme.org/get-involved/groups-sections-and-technical-divisions/technical-divisions/technical-divisions-community-pages/computers-information-in-engineering#about

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https://www.asme.org/professional-membership

https://community.asme.org/computersinformationengineering/default.aspx