

namri | sme<sup>s</sup>

2023

AWARDS PROGRAM

namrc 51  
North American Manufacturing Research Conference

June 12 - 16, 2023

Rutgers University, New Brunswick, New Jersey

2022-23

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2022-24

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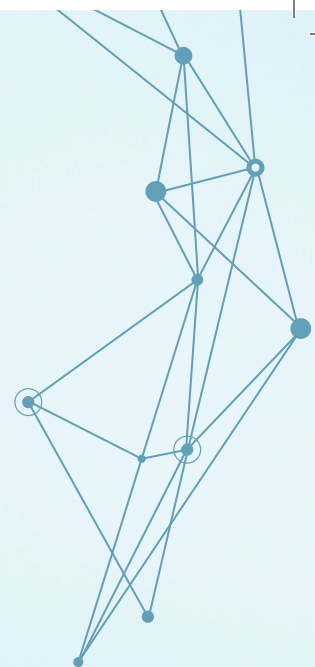
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**Xun Xu**, PhD, FASME  
The University of Auckland



Scientific Committee Advisor  
**Ihab Ragai**, PhD, CMfgE, PE  
Penn State Behrend College



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**Manufacturing Systems — General Submission**

**Track Chair:** Xun Xu

**Track Co-Chairs:** Laine Mears,\*\* Ray Zhong

**Members:** Grace Guo, Yuqian Lu, Paol Parenti, Dazhong Wu,\* Thorsten Wuest, David Culler, Pai Zheng

**Track 2**

**Manufacturing Processes — General Submission**

**Track Chair:** Stefania Bruschi

**Track Co-Chairs:** Wayne Cai, Till Clausmeyer

**Members:** William Embloom, Brad Kinsey, Yannis Korkolis, Scott Wagner, Dinakar Sagapuram, Rohan Shirwaiker, Torgeir Welo

**Track 3**

**Material Removal**

**Track Chair:** Jeff Ma^

**Track Co-Chairs:** Jahan Mohammad, Mike Vogler

**Members:** Shuting Lei, Barbara Linke, Brigid Mullany, Chandra Nath, Christopher Saldana, Tony Schmitz, Iqbal Shareef, Zhongde Shi

**Track 4**

**Additive Manufacturing**

**Track Chair:** Jingyan Dong^

**Track Co-Chairs:** Murali Sundaram,^ Bruce L. Tai

**Members:** Bruno Azeredo, Fiona Zhao, Jia Deng, Jun Yin, Changxue Xu, Yong Chen, Tsz-Ho Kwok, Yayue Pan, Yiwei Han

**Track 5**

**Smart Manufacturing — Processes, Systems and Integration**

**Track Chair:** Z.J. Pei

**Track Co-Chairs:** Robert Landers, Qing (Cindy) Chang

**Members:** Xu Chen, Zhaoyan Fan, David Hoelzle, Shaopeng Liu, Hantang Qin, Chenhui Shao, Rok Vrabič, Peng Wang, Xi Vincent Wang\*, Gloria Wiens

**Track 6**

**Manufacturing Education and Case Studies**

**Track Chair:** Johnson Samuel

**Track Co-Chairs:** Jyhwen Wang, Jeffrey A. Abell

**Members:** John Hart, Dale Lombardo, Sangkee Min, Johnson Samuel^

**NEW! Track 7**

**Sustainable Manufacturing**

**Track Chair:** Shaw C. Feng

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**Members:** Chris Yuan, Sekhar Rakurty, Fazleena Badurdeen, Ryan Bradley, Daniel Cooper, Nancy Diaz-Elsayed, Guiseppa Ingarao, Hong-Chao Zhang, Jeremy Rickly, Devanathan Ramanujan

\*\* Editor-in-Chief of Journal of Manufacturing Letters  
\* Associate Editor of Journal of Manufacturing Systems  
^ Associate Editor of Journal of Manufacturing Processes

# namrc 51 Outstanding Paper Award

North American Manufacturing Research Conference

The NAMRC 51 Outstanding Paper Award recognizes both the engineering value and industrial relevance of publications presented at NAMRC. The top three 2023 papers were selected.

## Outstanding Paper in Manufacturing Systems:



### NAMRC-88

“Life Cycle Assessment of Aluminum Alloys Chips Recycling Through Single and Multi-Step Friction Stir Consolidation Processes”

by **Giuseppe Ingarao, Massimiliano Amato, Abdul Latif, Angela Daniela La Rosa, Rosa Di Lorenzo** and **Livan Fratini**

## Outstanding Papers in Manufacturing Processes:



### NAMRC-33

“Physical Modeling for Digital Twin of Continuous Damping Control Damper”

by **Tao Li, Zhongyuan Liao** and **Yi Cai**



### NAMRC-183

“Generation of Periodic Nanobumps Through a Double-Scan Method with Femtosecond Lasers”

by **Kewei Li, Shreyas Limaye** and **Xin Zhao**

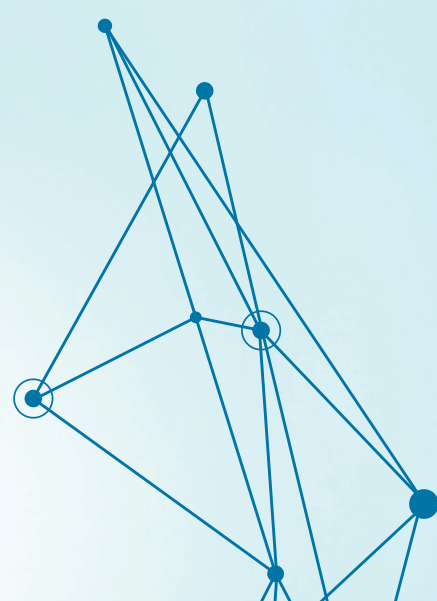
# namrc 51 Outstanding Reviewers

North American Manufacturing Research Conference

**Enrico Simonetto**, PhD  
University of Padova

**Bingqing Tan**, PhD  
University of Hong Kong

**James Nowak**, PhD  
MIT Lincoln Laboratory





## S.M. Wu Research Implementation Award

# Research Implementation



**Jaydeep Mohan Karandikar, PhD**  
Oak Ridge National Laboratory

### Summary

Dr. Jaydeep Mohan Karandikar presented two papers at NAMRC that described methods for machining parameter selection for total cost optimization considering tool life. The method enables in-process optimization of machining processes in an industrial environment, eliminating expensive laboratory experiments. Karandikar implemented the idea at GE, which realized 30% average cost reduction across 200+ operations, resulting in ~\$20 million annualized savings for GE Aviation.

### NAMRC Paper Citations

**Karandikar J., Schmitz T., Abbas A.**

**“Spindle Speed Selection for Tool Life Testing Using Bayesian Inference”**

Journal of Manufacturing Systems. 2012 Oct 1;31(4):403-11. Presented at NAMRC 40 (2012)

**Karandikar J., Kurfess T.**

**“Cost Optimization and Experimental Design in Milling Using Surrogate Models and Value of Information”**

Journal of Manufacturing Systems. 2015 Oct 1;37:479-86. Presented at NAMRC 42 (2014)

# Award



# 2023 Delcie Durham Outstanding Young Manufacturing Engineer Award

**Delcie Durham**  
Professor Emerita  
University of South Florida



**Yong Lin Kong, PhD**  
University of Utah



**Hongyue Sun, PhD**  
State University of New York  
at Buffalo



**Cindy (Xiangjia) Li, PhD**  
Arizona State University



**Zixuan (Zoe) Zhang, PhD**  
McKinsey & Company



**Jon-Erik Mogonye, PhD**  
DEVCOM US Army  
Research Laboratory



**Hangbo Zhao, PhD**  
University of Southern  
California



**Hantang Qin, PhD**  
University of Wisconsin-Madison





# 2023 Outstanding Lifetime Service Award



## Serope Kalpakjian, FSME

Professor Emeritus  
Illinois Institute of Technology

Serope Kalpakjian is professor emeritus of Mechanical and Materials Engineering, the Illinois Institute of Technology. He is the author of “Mechanical Processing of Materials” and co-author of “Lubricants and Lubrication in Metalworking Operations” (with E.S. Nachtman). The first editions of his textbooks “Manufacturing Processes for Engineering Materials” and “Manufacturing Engineering and Technology” have received the M. Eugene Merchant Manufacturing Textbook Award. Kalpakjian has conducted research in various areas of manufacturing, is the author of numerous technical papers and articles in handbooks and encyclopedias, and has edited a number of conference proceedings. He also has been editor and co-editor of several technical journals and has served on various editorial boards, including the Encyclopedia Americana.

Among various awards, Kalpakjian has received the Forging Industry Educational and Research Foundation Best Paper Award, the Excellence in Teaching Award from IIT, the ASME Centennial Medallion, the International Education Award from SME, A Person of the Millennium Award from IIT, the Albert Easton White Outstanding Teacher Award from ASM International, and the 2016 SME Gold Medal Award. The Outstanding Young Manufacturing Engineer Award of SME, for 2001, was named after him. Kalpakjian is a Life Fellow ASME, Fellow SME, Fellow and Life Member ASM International, Fellow Emeritus International Academy for Production Engineering (CIRP), and is a founding member and past president of NAMRI. He is a graduate of Robert College (High Honor, Istanbul), Harvard University and the Massachusetts Institute of Technology.

*Lifetime*

*Service*



**Scott Smith, PhD, FSME**  
 Section Head - Precision Manufacturing and Machining  
 Oak Ridge National Laboratory

## How Did We Get Here, and What Are We Going to Do?

NAMRI | SME Founders Lecture, June 2023

Manufacturing and manufacturing innovation are important, and they always have been. Manufacturing is the fundamental mechanism of wealth creation. Manufacturing innovation even improves the productivity of other wealth creation mechanisms like farming and mining by creating the necessary tools for those sectors. A distinguishing characteristic of being human has been our ability to manufacture things that people need and want. Manufacturing is crucial to the economy, to our health and welfare, and to national security. Innovation in manufacturing has brought into existence a world where today even relatively poor people can afford things that would have been unthinkable luxuries, even for the richest people hundreds of years ago. Manufacturing innovation is deflationary - it increases the buying power of existing wealth. The positive impact of manufacturing innovation on our quality of life is undeniable.

The U.S. has been a traditional manufacturing powerhouse, but is that still true? The extent of our dependency was clearly shown during the recent pandemic and supply chain shortages. Why then, did the U.S. let manufacturing go? How did we get in a position where we are not self-sufficient, but dependent? More importantly, what are we going to do about it?

# namrc 51

North American Manufacturing Research Conference



*Celebrating  
Excellence*



# namri | sme **Journal Recognitions**

SME would like to recognize the following individuals for their service, diligence and oversight in reviewing and editing the submissions for SME's three peer-reviewed journals.

## Manufacturing Letters



### **Editor-in-Chief**

**Laine Mears**, PhD, FSME  
Clemson University

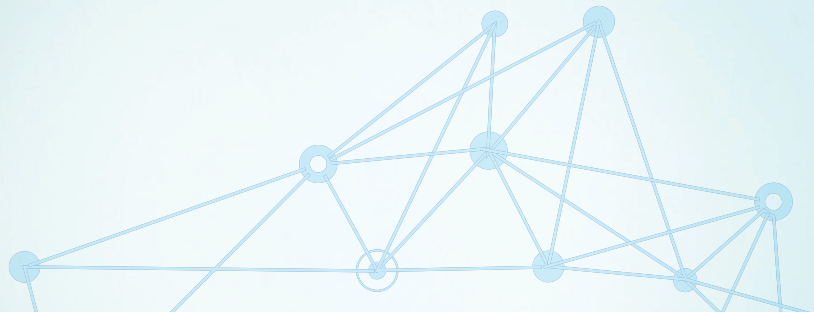
### **2022 Manufacturing Letters Outstanding Associate Editor**

**Ramy Harik**  
University of South Carolina

### **2022 Manufacturing Letters Outstanding Reviewers**

**Alessandra Caggiano**  
University of Naples Federico II

**Clint Saidy**  
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**R. Malhotra**  
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**P. Wiederkehr**  
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**F. Zhao**  
Purdue University





# Journal of Manufacturing Letters Best Paper Award

## Award Criteria

The Manufacturing Letters Best Paper Award is given for the work with the highest number of citations over the past five years, demonstrating the spirit of novelty and impact sought by the journal. No paper can receive this award more than once.

## Qualification Period

One Best Paper is awarded each year to a JML paper published in the past seven years.

## Citation-Based

The impact of a paper is measured based on the number of citations in Scopus in the past five years. The Journal of Manufacturing Letters Best Paper goes to the paper with the highest number of citations.

## Exclusion Rule

No paper shall receive this award more than once.

## Award Type

Certificate.

## Announcement

In June of each calendar year at NAMRC, in person or by email.

## 2022 Award Winner

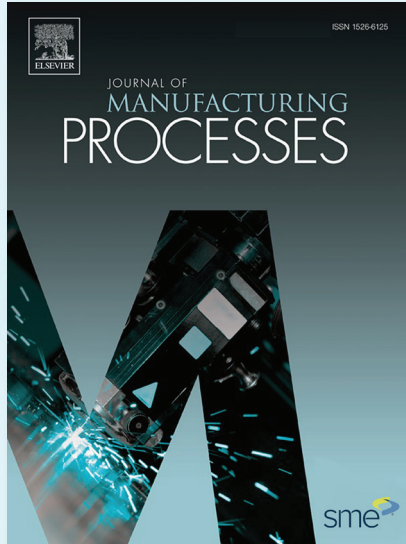
**Jay Lee, Moslem Azamfar, and Jaskaran Singh**

**“A Blockchain Enabled Cyber-Physical System  
Architecture for Industry 4.0 Manufacturing Systems,”**

Manufacturing Letters 20:34-39, 2019



# Journal of Manufacturing Processes



## Editor-in-Chief

**Shiv G. Kapoor**, PhD, FSME  
University of Illinois at Urbana-Champaign

## 2022 Journal of Manufacturing Processes Area Editor

**Shiv G. Kapoor**, PhD, FSME: Advanced embossing, casting, forming and molding processes at all scales; continuum and subcontinuum manufacturing process modeling and simulation, smart/intelligent manufacturing processes including sensing, diagnostics, and real-time control

**YuMing Zhang**, PhD: Welding/joining/additive manufacturing including, arc welding processes; solid state welding and brazing processes including friction stir welding; high energy beam welding processes including laser, laser-arc hybrid, and electron beam welding; additive manufacturing processes including wire arc additive manufacturing

**Martin Jun**, PhD: Advanced manufacturing processes and automation, including meso/micro/nano fabrication and including imprint lithography; advanced manufacturing processes, including mechanical, chemical, and thermal processes; rapid prototyping, rapid manufacturing, stereolithography and other 3-D fabrication techniques that can use optical projection; machine learning, signal/image processing, and data driven approaches; tribology and wear issues relevant to manufacturing processes

## 2022 Journal of Manufacturing Processes Outstanding Associate Editor

**Fuqian Yang**, PhD  
University of Kentucky

## 2022 Journal of Manufacturing Processes Outstanding Reviewers

**Chandra Sekhar Rakurty**, PhD  
The M. K. Morse Company

**Yixuan Feng**, PhD  
Morgan Advanced Materials

**John Dimitrios Kechagias**, PhD  
University of Thessaly

## 2023 Journal of Manufacturing Processes

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**M. Banu**

University of Michigan

**G. Cheng**

Purdue University

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of Tarbes, France

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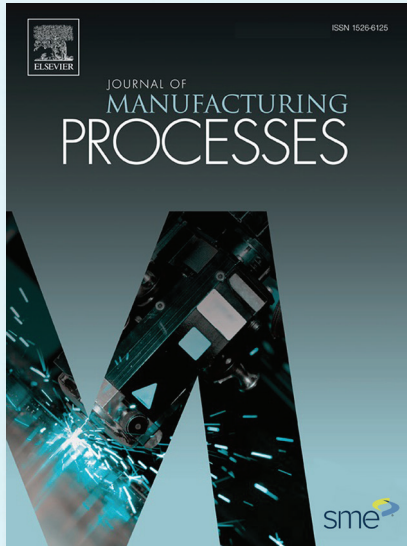
**F. Yang**

University of Kentucky

**X. Zhao**

Clemson University





# Journal of Manufacturing Processes Best Paper Award

The Journal of Manufacturing Processes (JMP) Best Paper Award is awarded annually to the paper published within the past seven years that has received the highest number of citations, as measured in Scopus within the past five years.

## Award Criteria

### Exclusion Rule

No paper shall receive this award more than once.

### Award Type

Certificate.

### Announcement

In June of each calendar year at NAMRC, in person or by email.

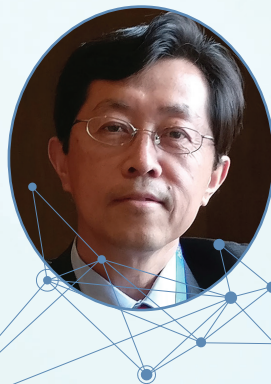
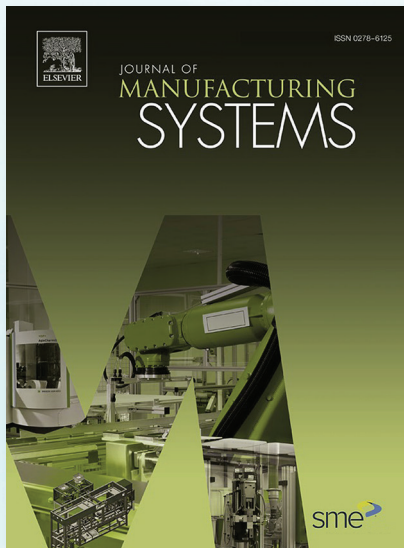
## 2022 Award Winner

**Shangren Li, Gaoyang Mi, Chunming Wang**

**“A Study on Laser Beams Oscillating Welding Characteristics for the 5083 Aluminum Alloy: Morphology, Microstructure and Mechanical Properties”**

Journal of Manufacturing Processes 53 (2020) 12-20

# Journal of Manufacturing Systems



## Editor-in-Chief

**Lihui Wang**, PhD, FSME, PE  
KTH Royal Institute of Technology

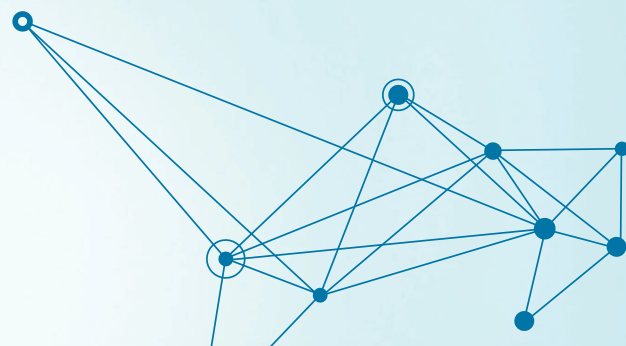
## 2022 Journal of Manufacturing Systems Outstanding Associate Editor

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Federal University of Santa Catarina

## 2022 Journal of Manufacturing Systems Outstanding Reviewers

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University of Oslo

**Ray Y. Zhong**  
University of Hong Kong



# 2023

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Federal University of Santa Catarina

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Xi'an Jiaotong University

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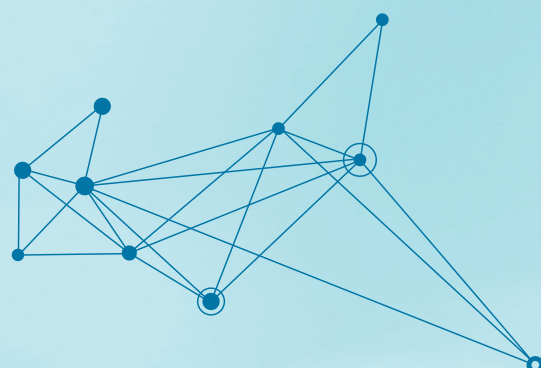
**L. Wells**  
Western Michigan University

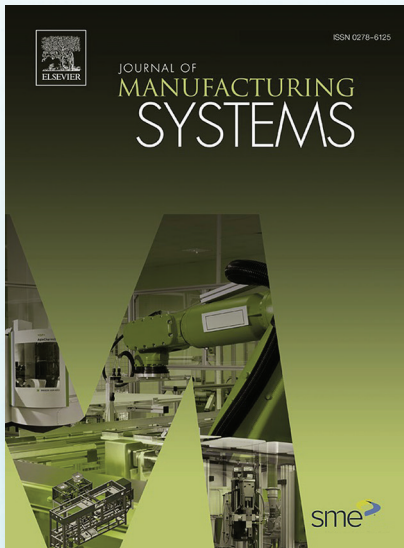
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**C. Yang**  
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**H. Yang**  
Penn State University

**P. Zheng**  
The Hong Kong  
Polytechnic University





# Journal of Manufacturing Systems Best Paper Award

The Journal of Manufacturing Systems (JMS) Best Paper Award is awarded annually to the JMS paper published within the past seven years that has received the highest number of citations, as measured in Scopus within the past five years.

## Award Criteria

### Qualification Period

One Best Paper is awarded each year to a JMS paper published in the past seven years.

### Citation-Based

The impact of a paper is measured based on the number of citations in Scopus in the past five years. The Journal of Manufacturing Systems Best Paper goes to the paper with the highest number of citations.

### Exclusion Rule

No paper shall receive this award more than once.

### Award Type

Certificate.

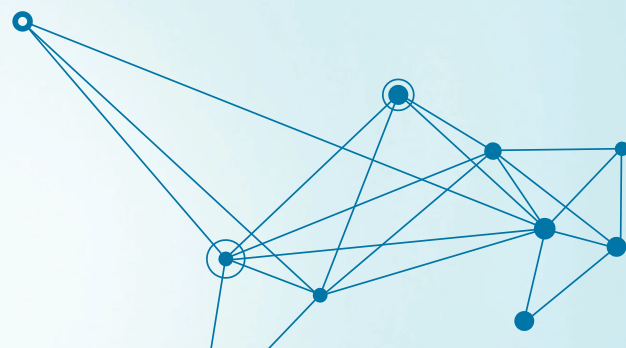
### Announcement

In June of each calendar year at NAMRC, in person or by email.

## 2022 Award Winner

**Fei Tao, Qinglin Qi, Ang Liu, Andrew Kusiak**  
“Data-Driven Smart Manufacturing”

Journal of Manufacturing Systems  
Vol.48, pp.157-169, 201





## 2023 Student Research Presentation Award Finalist

As part of the annual North American Manufacturing Research Conference (NAMRC), a Student Research Presentation Award is presented in recognition of students' contributions to NAMRC. Encouraging young talents to pursue a career in manufacturing research is of vital importance to the long-term goals of the manufacturing community.

Embedding Ionic Hydrogel in 3D Printed Human-Centric Devices for Mechanical Sensing  
**Baanu Payandehjoo and Tsz Ho Kwok**

Bi-metal Structures Fabricated by Extrusion-Based Sintering-Assisted Additive Manufacturing  
**Dayue Jiang and Fuda Ning**

Accurate Prediction of Machining Cycle Times and Feedrates with Deep Neural Networks using BiLSTM  
**Shih-Hsuan Chien, Burak Sencer and Robert Ward**

Generation of Periodic Nanobumps Through a Double-Scan Method with Femtosecond Lasers  
**Kewei Li, Shreyas Limaye and Xin Zhao**

Simulation Modeling of the Counterfeit Threat and Countermeasures in ICT Manufacturing Supply Chains  
**Rong Lei, Samar Saleh, Weihong Guo, Fred Roberts and Elsayed Elsayed**

The Use of Virtual Reality in Manufacturing Education: State-of-the-Art and Future Directions  
**Md Humaun Kobir, Yiran Yang, Shuchisnigdha Deb and Miao He**

Surface Roughness Prediction through GAN-Synthesized Power Signal as a Process Signature  
**Clayton Cooper, Jianjing Zhang, Yuebin Guo and Robert Gao**

Learning Digital Emulators for Closed Architecture Machine Tool Controllers  
**Akash Tiwari, Yuandong Wang, Kyle Saleeby, Narasimha Reddy and Satish Bukkapatnam**

Integration of Industry 4.0 into Lean Production System: A Systematic Literature Review  
**Md Monir Hossain and Gregory Purdy**



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# BLUE SKY COMPETITION

## Finalists

### **3D Printing of Shape-Conformable and Structural Batteries**

Alexis Maurel, The University of Texas at El Paso

### **Beyond The Blueprint: Conversational AI as a Game-Changer in Manufacturing**

Aditya Balu, Anushrut Jignasu, Adarsh Krishnamurthy, Baskar Ganapathysubramanian  
Iowa State University

### **Cognitive Manufacturing Machines**

Binil Starly, Arizona State University

### **Digital Twin for Bioprinting Process Monitoring and Control**

Bo Shen, New Jersey Institute of Technology  
Yanglong Lu, Hong Kong University of Science and Technology

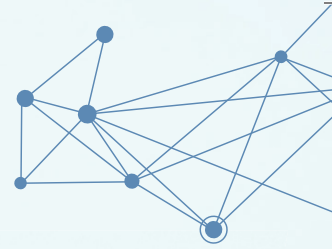
### **Mechanobiological Manufacturing of Functional Products**

Yong Huang, University of Florida, Zhijian (Z.J.) Pei, Texas A&M University  
Steven Y. Liang, Georgia Institute of Technology

### **The Intelligent Machine Tool**

Radu Pavel, TechSolve, Inc.  
Steven R. Schmid, University of North Carolina at Charlotte

# Thank YOU



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