ASME® 2020 ISFA
International Symposium on Flexible Automation

Supported by: The Institute of Systems, Control and Information Engineers

iSCIe

CONFERENCE
July 8–9, 2020

Virtual, Online

Program

https://event.asme.org/ISFA

The American Society of Mechanical Engineers®
ASME®

ASME®
SETTING THE STANDARD

Welcome to the 2020 International Symposium on Flexible Automation (ISFA). Jointly sponsored by the American Society of Mechanical Engineers (ASME) and the Institute of Systems, Control and Information Engineers (ISCIE) in Japan, the conference begins July 8th with a welcome reception. Plenary talks and technical presentations are planned throughout. The ISFA awards ceremony will be held on July 9th to end the conference.

ISFA2020 provides a focused and intimate setting for dissemination and discussion of advanced manufacturing technologies and other related fields such as dynamical systems and control, logistics and informatics, and design and optimization. The theme of ISFA 2020 is "Flexible Automation: Intelligent and Transformative" and aims to inspire research on empowering manufacturing system with intelligence and on transformative ideas. The conference features synergistic blend of topics encompassing various aspects of manufacturing, in which the program is distributed into eight technical tracks with 3 parallel sessions. The conference tracks include:

    (1) Additive Manufacturing Sensing and Control;
    (2) Cutting and Machine Tools;
    (3) Digital Design and Manufacturing;
    (4) Flexible Automation in Manufacturing Systems;
    (5) Industrial Robotics;
    (6) Manufacturing Controls and Machine Automation;
    (7) Sensing and Information Extraction;
    (8) Smart/Sustainable Manufacturing.

In addition to high quality technical presentations, the conference includes several plenary talks given by leading experts in manufacturing. The conference also holds the best paper competition. The winners of the best paper in theory and the best paper in application will be announced at the end of the conference.

We are especially grateful for the participation of the many volunteers who ensure the high technical standards of the conference and an engaging program. The conference has been made possible by the contributions of our program committee, advisory committee, technical reviewers, and the authors of the papers. We are thankful to our plenary speakers for agreeing to participate and share their expertise and knowledge with the community.

We're looking forward to a great meeting. We hope you enjoy the conference and have a fantastic time sharing ideas and catching up with colleagues.

Sincerely,

Jian Cao, Organizing Committee Chair
Cardiss Collins Professor, Department of Mechanical Engineering
Northwestern University
USA

Hideki Aoyama, Organizing Committee Co-Chair

Professor, Department of System Design Engineering
Keio University
Japan

Jiong Tang, Program Committee Chair
Professor, Department of Mechanical Engineering
University of Connecticut
USA

Soichi Ibaraki, Program Committee Co-Chair
Professor, Department of Mechanical Systems Engineering
Hiroshima University
Japan

Masayoshi Tomizuka, Advisory Committee Chair
Cheryl and John Neerhout, Jr. Distinguished Professor
Department of Mechanical Engineering
University of California, Berkeley
USA

Tohru Watanabe, Advisory Committee Co-Chair
Emeritus Professor
Ritsumeikan University
Japan

Schedule at a Glance - All Times in US EDT (+13hr for JST)

All Times in US EDT - Day 1 (July 8) - All Times in US EDT

6:30PM	6:40PM	Welcome (Live)– Dr. Jian Cao – ISFA Organizing Committee Chair Dr. Masayoshi Tomizuka - ISFA Advisory Committee Chair Toshiya Kaihara Ph.D. – ISCIE President Thomas Costabile - ASME CEO Plenary # 1 Introduction of Thomas R. Kurfess, Ph.D., P.E.		
6:40PM	7:15PM	Plenary # 1 (Live) – Thomas R. Kurfess, Ph.D., P.E. - Chief Manufacturing Officer: Oak Ridge National Laboratory "Integrating Hybrid Manufacturing Processes via the Digital Thread"		
7:15PM	7:25PM	Tom Costabile Moderates Plenary #1 Q&A		
7:25PM	7:35PM	Break		
7:35PM	8:10PM	Plenary # 2 (Live) – Shinsuke Sakakibara, Dr. Eng - Chief Technical Advisor: Fanuc Corporation "Current status and future prospect of smart manufacturing by robot and IoT"		
8:10PM	8:20PM	Prof. Mamoru Mitsuishi Moderates Plenary # 2 Q&A		
8:20PM	8:30PM	Break		
		Room 1 - Session Chairs: Yayue Pan & Yasuhiro Kakinuma Additive manufacturing sensing and control 1	Room 2 - Session Chairs: Liang Zhang & Haruhiko Suwa Flexible Automation in Manufacturing System 1	Room 3 - Session Chairs: Xiangjia Li & Hideki Aoyama Digital Design and Manufacturing 1
8:30PM	9:50PM	Technical Paper Publication: ISFA2020-9611 - Closed-Loop Simulation Integrating Finite Element Modeling With Feedback Controls in Powder Bed Fusion Additive Manufacturing Author: Chen, Xu; Presenter: Dan Wang	Technical Paper Publication: ISFA2020-9620 - A Conflict Free Routing Method for Automated Guided Vehicles Using Reinforcement Learning Author: Chujo, Taichi; Presenter: Tatsushi Nishi	Technical Paper Publication: ISFA2020-9640 - Material Model Calibration by Deep Learning for Additively Manufactured Alloys Author: Xu, Hongyi
		Technical Paper Publication: ISFA2020-9615 - Online-Correction of Robot-Guided Fused Deposition Modeling Author: Mewes, Gian	Technical Paper Publication: ISFA2020-9627 - A Production Planning Based on Shipping Record for Food Company Author: Uematsu, Hiroya	Technical Paper Publication: ISFA2020-9612 - Design of a Two-Piece Brassiere Cup From Its Data Points Toward Its Automation Author: Yoshida, Kotaro
		Technical Presentation Only: ISFA2020-9668 - Software Compensation of Undesirable Racking Motion of H-Frame 3d Printers Using Filtered B-Splines Author: Edoimioya, Nosakhare	Technical Paper Publication: ISFA2020-9639 - Scheduling-Based Adaptive Operations of Handling Manipulators to Reduce Downtime in Manufacturing Systems Author: Suwa, Haruhiko; Presenter: Ryo Yonemoto	Technical Paper Publication: ISFA2020-9624 - 3d Shape Prediction of a Paper Model for a Brassiere Cup Consisting of Multiple Polygonal Patterns Author: Wakamatsu, Hidefumi
		Technical Paper Publication: ISFA2020-9648 - Identifying the Cyber-Incidents in Additive Manufacturing Systems via Multimedia Signals Author: Yang, Wei; Presenter: Jialei Chen	Technical Paper Publication: ISFA2020-9614 - Behavior Modeling for Product Design Support Focusing on Topological Information of Components Author: Hatano, Itsuki	Technical Paper Publication: ISFA2020-9642 - Microstructure comparison using dissimilarity metric for additive manufacturing of metals Author: Farooq Ghumman, Umar
		Technical Paper Publication: ISFA2020-9650 - Investigation of a Magnetic-Field-Assisted Stereolithography Process for Printing Functional Part With Graded Materials Author: Pan, Yayue; Presenter: Erina Baynorjir	Technical Paper Publication: ISFA2020-9628 - Development of Cam Software to Achieve Automated Nc Program Generation (Application to Machining From Near Net Shape Material) Author: Nishida, Isamu	Technical Paper Publication: ISFA2020-9626 - Rapid Estimation of Die and Mold Machining Time Without Nc Data by Ai Based on Shape Data Author: Takizawa, Hiroki
		Technical Presentation Only: ISFA2020-9667 - Model-Based Feed-Forward Deposition Control for Additive Manufacturing Author: Wu, Pinyi		Technical Paper Publication: ISFA2020-9644 - 3d Printing Collembola Cuticle Inspired Superhydrophobic Microstructures for Potential Deicing Application Author: Li, Xiangjia
9:50PM	10:10PM	Room 1 - AMSC 1 Q/A	Room 2 - FAMS 1 Q/A	Room 3 - DDM 1 Q/A

10:10PM	10:20PM	Break		
10:20PM	11:40PM	**Room 1 - Session Chairs: Ashwin Dani & Soichi Ibaraki** **Industrial Robotics 1**	**Room 2 - Session Chairs: Zhaoyan Fan & Ryuta Sato** **Sensing and Information Extraction 1**	**Room 3 - Session Chairs: Ping Guo & Daisuke Kono** **Cutting and Machine tools 1**
		Technical Paper Publication: ISFA2020-9621 - Modeling Force Fluctuations in Incremental Sheet Forming Author: Landers, Robert; Presenter: Micheal Prize	Technical Paper Publication: ISFA2020-9636 - Feature-Based Transfer Learning for Bearing Fault Recognition Without Available Fault Data Author: Cooper, Clayton	Technical Paper Publication: ISFA2020-9610 - Sensitivity Analysis of Error Motions and Geometric Errors in the Case of Sphere-Shaped Workpiece Author: Li, Zongze
		Technical Paper Publication: ISFA2020-9631 - Development of Sensorless Force-Control-Based End-Effector for Automated Robot Polishing Author: Tsukada, Takuhiro	Technical Paper Publication: ISFA2020-9637 - Strain Transfer Analysis for Surface Bonded Fiber Sensor Considering Temperature Influence Author: Fan, Zhaoyan; Presenter: Xiaochen Hu	Technical Paper Publication: ISFA2020-9629 - Precise Cutting Force Estimation by Hybrid Estimation of Dc/ac Components Author: Sato, Taiki
		Technical Paper Publication: ISFA2020-9655 - Identification of a Kinematic Model of a 6dof Industrial Manipulator With Angular Positioning Deviation 'Error Map' of Rotary Axes Author: ALAM, MD MOKTADIR	Technical Paper Publication: ISFA2020-9616 - Change Detection in Drilling Process Based on Temperature Nearby Cutting Edge by Lstm Neural Network Author: Suwa, Haruhiko	Technical Paper Publication: ISFA2020-9605 - On-Machine Diamond Tool Shaping to Realize Highly Efficient Ultraprecision Machining System Author: Xu, Meng
		Technical Paper Publication: ISFA2020-9660 - Combining Motion Primitives and Image-Based Visual Servo Control for Manufacturing Assembly Author: Dani, Ashwin; Presenter: Ghananeel Rotithor	Technical Paper Publication: ISFA2020-9607 - On Classification and Quantification of Sensory Parameters in Judging Mirror Surface: Appearance of a Turned Aluminum Alloy Surface Author: Ihara, Motohiro	Technical Paper Publication: ISFA2020-9606 - On-Machine Measuring Instrument of Workpiece Compliance Uing Laser Interferometer Author: Kono, Daisuke
		Technical Paper Publication: ISFA2020-9656 - Straightness Error Measurement of the Entire Industrial Robot's Workspace Using Psd Module Author: Tomita, Masatoshi	Technical Paper Publication: ISFA2020-9646 - Application of Mosa Algorithm in Gleeble Testing Model Updating Author: Tang, Jiong; Presenter: Dong Xu	Technical Presentation Only: ISFA2020-9664 - Fabrication of Blazed Gratings Using a Combined Cutting and Forming Process With Elliptical Tool Vibration Author: Guo, Ping; Presenter: Jianjian Wang
		Technical Paper Publication: ISFA2020-9619 - Machining Performance Evaluation of Robot Type Machine Tool Based on Forward Kinematics Model Author: Hayashi, Akio	Technical Paper Publication: ISFA2020-9632 - Fuzzy Classfication of Gear Fault Using Principal Component Analysis-Based Fuzzy Neural Network Author: Tang, Jiong; Presenter: Kai Zhou	Technical Paper Publication: ISFA2020-9633 - Study on Adhesion With Stress and Temperature in Drilling of Aluminum Alloy Author: Matsumura, Takashi
11:40PM	11:59PM	Room 1 - IR 1 Q/A	Room 2 - SIE 1 Q/A	Room 3 - CMT 1 Q/A

		All Times in US EDT - Day 2 (July 9) - All Times in US EDT -
6:30PM	6:40PM	Welcome (Live)– Jiong Tang Ph.D – ISFA Program Committee Chair Introduction of Plenary # 3 – Kornel Ehmann, Ph.D. - Professor: Mechanical Engineering Northwestern University
6:40PM	7:15PM	Plenary # 3 (Live) – Kornel Ehmann, Ph.D. - Professor: Mechanical Engineering Northwestern University "Hybrid Multi-scale Manufacturing Processes and Systems - A Virtual Tour of Northwestern Manufacturing"
7:15PM	7:25PM	Jiong Tang Ph.D Moderates Plenary # 3 Q&A
7:25PM	7:35PM	Break
7:35PM	8:10PM	Plenary # 4 (Live) – Masahiko Onosato, Ph.D - Professor: Faculty of Information Science and Technology Hokkaido University "Research on Production Systems: does it still fascinate ambitious students?"
8:10PM	8:20PM	Soichi Ibaraki Ph.D Moderates Plenary # 4 Q&A
8:20PM	8:30PM	Break

		Room 1 - Session Chairs: Peng Wang & Daisuke Kokuryo Smart and Sustainable Manufacturing 1	Room 2 - Session Chairs: Minghui Zhang & Takashi Tanizaki Manufacturing Controls and Machine Automation 1	Room 3 - Session Chairs: Hongyi Xu & Hidefumi Wakamatsu Digital Design and Manufacturing 2
8:30PM	9:50PM	Technical Paper Publication: ISFA2020-9609 - Dynamic Gesture Design and Recognition for Human-Robot Collaboration With Convolutional Neural Networks Author: Chen, Haodong	Technical Paper Publication: ISFA2020-9622 - Kinematic Calibration and Data-Based Error Compensation of a Parallel Robot-Based Incremental Sheet Forming Machine Author: Liao, Shuheng	Technical Paper Publication: ISFA2020-9651 - Effects of Residual Stress on Composite Strength Author: Zhang, Dianyun; Presenter: Haotian Sun
		Technical Paper Publication: ISFA2020-9643 - Transferable Deep Learning for In-Situ Tool Wear Diagnosis Author: Wang, Peng	Technical Paper Publication: ISFA2020-9604 - Application of Scatter Search With Path Relinking for Scheduling Problems With Crane Interference Author: Tanizaki, Takashi	Technical Paper Publication: ISFA2020-9649 - A Data Fusion Framework for Fracture Toughness Modeling Using Multiple Sources of Data Author: Mou, Shancong
		Technical Paper Publication: ISFA2020-9630 - A Novel Automated Image Analysis and Cell Identification System Using Machine Learning Method Author: Itano, Keiko	Technical Paper Publication: ISFA2020-9653 - Exact H2 Optimal Solutions to a Sdof System With Electromagnetic Tuned Inerter Damper for Vibration Control Author: Zuo, Lei; Presenter: Yifan Luo	Technical Paper Publication: ISFA2020-9652 - A Digital Twin of Multi-Axis Machine Tool for Micro Process Planning Author: Tanaka, Fumiki
		Technical Paper Publication: ISFA2020-9638 - A Proposal of Resource Allocation Method Based on Combinatorial Double Auction Technique in Crowdsourced Manufacturing Author: Kokuryo, Daisuke	Technical Paper Publication: ISFA2020-9635 - Fractional-Order Variable-Gain Super-Twisting Control With Application to Wafer Stages of Photolithography Systems Author: Kuang, Zhian	Technical Paper Publication: ISFA2020-9658 - Tool Path Generation Method for High-Quality Machining of Free-Form Surfaces Author: Takanashi, Yuki
		Technical Paper Publication: ISFA2020-9617 - Comprehensive Scheduling Method in Project Management Under Uncertain Environment Author: Morita, Daisuke	Technical Paper Publication: ISFA2020-9608 - Improved Accuracy of a Machining Tool With a Constant Cutting Speed Vector and Outside Approach Path Author: Suzuki, Takamaru	
		Technical Paper Publication: ISFA2020-9641 - Smart Production System Modeling: Bernoulli Serial Line Case Author: Zhang, Liang; Presenter: Tianyu Zhu	Technical Presentation Only: ISFA2020-9665 - Feedback Control of Hybrid Manufacturing Processes With Infrared Thermal Measurements and Low-Cost Sensors Author: Saleeby, Kyle	
9:50PM	10:10PM	Room 1 - SSM 1 Q/A	Room 2 - MCMA 1 Q/A	Room 3 - DDM 2 Q/A
10:10PM	10:20PM	Break		
10:20PM	11:00PM	Room 1 - Session Chairs: Minghui Zhang & Isamu Nishida Flexible Automation in Manufacturing System 2	Room 2 - Session Chairs: Xu Chen & Hiroyuki Narahara Additive manufacturing sensing and control 2	
		Technical Paper Publication: ISFA2020-9657 - A Real-Time Receding Horizon Sequence Planner for Disassembly in a Human-Robot Collaboration Setting Author: Zheng, Minghui; Presenter: Meng-Lun Lee	Technical Presentation Only: ISFA2020-9663 - Robust Lpv Model-Based Extrusion Control for Additive Manufacturing Using Filtered Basis Functions Author: Wu, Pinyi	
		Technical Paper Publication: ISFA2020-9659 - Human-Robot Collaboration: a Predictive Collision Detection Approach for Operation Within Dynamic Environments Author: Wiens, Gloria; Presenter: Gabriel Streitmatter	Technical Presentation Only: ISFA2020-9662 - Digital Thread for Direct Energy Deposition Towards Improved Part Quality and Quicker Qualification Author: Megahed, Mustafa	
		Technical Paper Publication: ISFA2020-9613 - Bending Simulation of a Shielding Braid Toward Its Lifespan Prediction Author: Narita, Shuhei	Technical Paper Publication: ISFA2020-9654 - Active Interlayer Heating for Sustainable Selective Laser Sintering With Reclaimed Polyamide 12 Powders Author: Chen, Xu; Presenter: Feifei Yang	
11:00PM	11:10PM	Room 1 - FAMS 2 Q/A	Room 2 - AMSC 2 Q/A	
11:10PM	11:59PM	ISFA award ceremoney, best paper awards, and closing ceremony		

Thank you to all of our Committee Members

Advisory Committee

Chair: Masayoshi Tomizuka, University of California, Berkeley

Co-Chair: Tohru Watanabe, Ritsumeikan University

Members:

Ming Leu, Missouri University of Science and Technology

Robert Gao, Case Western Reserve University

Tom Kurfess, Oak Ridge National Laboratory and Georgia Tech

Toshiya Kaihara, Kobe University, President of ISCIE

Susumu Fujii, Kobe University

Mamoru Mitsuishi, University of Tokyo

Organizing Committee

Chair: Jian Cao, Northwestern University

Co-Chair: Hideki Aoyama, Keio University

Local members:

Kornel Ehmann, Northwestern University

Ping Guo, Northwestern University

Local staff:

Mengwei Liu

Maegen Gregory

Program Committee

Chair: Jiong Tang, University of Connecticut

Co-Chair: Soichi Ibaraki, Hiroshima University

Members:

Xu Chen, University of Washington	Yuebin Guo, Rutgers University
Yayue Pan, University of Illinois at Chicago	Doug Bristow, Missouri University of Science and Technology
Ping Guo, Northwestern University	Andrew Kusiak, University of Iowa
Xiangjia Li, Arizona State University	Hiroyuki Narahara, Kyushu Institute of Technology
Hongyi Xu, University of Connecticut	Yasuhiro Kakinuma, Keio University
Liang Zhang, University of Connecticut	Daisuke Kono, Kyoto University
Minghui Zheng, University at Buffalo	Daisuke Kokuryo, Kobe University
Ashwin Dani, University of Connecticut	Hidefumi Wakamatsu, Osaka University
Minghui Zhang, University at Buffalo	Haruhiko Suwa, Setsunan University
Zhaoyan Fan, Oregon State University	Isamu Nishida, Kobe University
Peng Wang, University of Kentucky	Ryuta Sato, Kobe University
Cong Wang, New Jersey Institute of Technology	Takashi Tanizaki, Kindai University
Shujuan Li, Xi'an University of Technology, China	
Hitomi Yamaguchi Greenslet, University of Florida	