



**International Conference on Industrial Digital Twins for Smart Manufacturing (ICIDTSM 2026)**  
20-22 July 2026, IC&SR, IIT Madras



| Monday - 20th July 2026 | Time             | TTJ, IC&SR                                                                                                                                                                                                                                      | Hall 3, IC&SR                                                                                                                                                                          | Hall 2, IC&SR                                                                                                                                                                                       |
|-------------------------|------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|                         | 9:30 - 10:15 AM  | Inaugural Session                                                                                                                                                                                                                               |                                                                                                                                                                                        |                                                                                                                                                                                                     |
|                         | 10:15 - 11:00 AM | Inaugural Talk<br><i>(Architecture and validation of digital twins for smart manufacturing)</i><br>Prof. Satish Bukkapatnam, Texas A&M University<br>Chair: Prof. GL Samuel                                                                     |                                                                                                                                                                                        |                                                                                                                                                                                                     |
|                         | 11:00 - 11:30 AM | High Tea Break                                                                                                                                                                                                                                  |                                                                                                                                                                                        |                                                                                                                                                                                                     |
|                         | 11:30 - 12:00 PM | Keynote 1:<br><i>(Smart Manufacturing - Opportunities and Challenges)</i><br>Prof. N. Ramesh Babu (Professor Emeritus, IIT Madras)<br>Chair: Prof. Sivasrinivasu Devadula                                                                       |                                                                                                                                                                                        |                                                                                                                                                                                                     |
|                         | 12:00 - 12:30 PM | Keynote 2:<br><i>(‘Everyone wants intelligent manufacturing. Who will teach it?’)</i><br>Prof. Mohit Law (IIT Kanpur)<br>Chair: Prof. Sundararajan Natarajan                                                                                    |                                                                                                                                                                                        |                                                                                                                                                                                                     |
|                         | 12:30 - 01:30 PM | Oral Presentation Session 1<br><i>(Theme: Sensing &amp; Communication Technologies)</i><br>Chair: Prof. N. Ramesh Babu (Professor Emeritus, IIT Madras),<br>Dr. Charchit Kumar (IIT Madras)                                                     | Oral Presentation Session 2<br><i>(Theme: Computation Metrology &amp; Machine Vision)</i><br>Chair: Prof. Satish Bukkapatnam (Texas A&M University),<br>Dr. Piyush Shakya (IIT Madras) | Oral Presentation Session 3<br><i>(Theme: AI for Vision, Safety &amp; Intelligent Monitoring)</i><br>Chair: Dr. Vignesh Vishnudas Shanbhag,<br>Dr. Amitava Ghosh (IIT Madras)                       |
|                         | 01:30 - 02:30 PM | Lunch Break                                                                                                                                                                                                                                     |                                                                                                                                                                                        |                                                                                                                                                                                                     |
|                         | 02:30 - 03:00 PM | Keynote 3:<br><i>(Role of Robots in Industry 4.0/5.0 towards Smart Manufacturing)</i><br>Prof. Santhakumar Mohan (IIT Palakkad)<br>Chair: Dr. Anuj Kumar Tiwari                                                                                 |                                                                                                                                                                                        |                                                                                                                                                                                                     |
|                         | 03:00 - 04:30 PM | Oral Presentation Session 4<br><i>(Theme: Advanced Manufacturing &amp; Additive Technologies)</i><br>Chair: Prof. Sam Anand (University of Cincinnati),<br>Prof. K Hariharan (IIT Madras)                                                       | Oral Presentation Session 5<br><i>(Theme: Robotics &amp; Automation)</i><br>Chair: Prof. Santhakumar Mohan (IIT Palakkad),<br>Prof. Anuj Tiwari (IIT Madras)                           | Oral Presentation Session 6<br><i>(Theme: Digital Twins for Robotics &amp; Autonomous Manufacturing)</i><br>Chair: Prof. Peter Gorm Larsen (Aarhus University),<br>Prof. PV Manivannan (IIT Madras) |
|                         | 04:30 - 04:45 PM | High Tea Break                                                                                                                                                                                                                                  |                                                                                                                                                                                        |                                                                                                                                                                                                     |
|                         | 04:45 - 05:30 PM | Panel Discussion 1<br><i>(Topic: Digital Twin Readiness: Maturity and Industrial Impact)</i><br>Moderator: Prof. GL Samuel<br>Panel Members: Prof. Satish Bukkapatnam, Prof. N. Ramesh Babu,<br>Prof. Mohit Law, Dr. Vignesh Vishnudas Shanbhag |                                                                                                                                                                                        |                                                                                                                                                                                                     |



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| Tuesday - 21st July 2026 | Time                                   | TTJ, IC&SR                                                                                                                                                                                                                                                                        | Hall 3, IC&SR                                                                                                                                                    | Hall 2, IC&SR                                                                                                                                                                               |
|--------------------------|----------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|                          | 9:30 - 10:00 AM                        | Keynote 4:<br><i>(Digital Twins for Products, Processes, and Humans in Manufacturing)</i><br>Prof. Sam Anand (University of Cincinnati)<br>Chair: Prof. Sushanta Kumar Panigrahi                                                                                                  |                                                                                                                                                                  |                                                                                                                                                                                             |
|                          | 10:00 - 10:30 AM                       | Keynote 5:<br><i>(From Sensor to Simulation: Trustworthy Sensing for Reliable Digital Twins in Smart Manufacturing)</i><br>Dr. Suchetna Chakraborty (IIT Jodhpur)<br>Chair: Dr. Rahul Yadav                                                                                       |                                                                                                                                                                  |                                                                                                                                                                                             |
|                          | 10:30 - 11:00 AM                       | High Tea Break                                                                                                                                                                                                                                                                    |                                                                                                                                                                  |                                                                                                                                                                                             |
|                          | 11:00 - 11:30 AM                       | Keynote 6:<br><i>(Agentic AI: the Next Frontier of Digital Twins)</i><br>Prof. Asim Tewari (IIT Bombay)<br>Chair: Dr. Charchit Kumar                                                                                                                                              |                                                                                                                                                                  |                                                                                                                                                                                             |
|                          | 11:30 - 12:30 PM                       | Oral Presentation Session 7<br><i>(Theme: AI &amp; ML for Smart Manufacturing)</i><br>Chair: Dr. Suchetna Chakraborty (IIT Jodhpur),<br>Dr. Sivasrinivasu Devadula (IIT Madras)                                                                                                   | Oral Presentation Session 8<br><i>(Theme: Physics-based Modeling &amp; Simulation)</i><br>Chair: Prof. Ramesh Singh (IIT Bombay),<br>Dr. Anil Meena (IIT Madras) | Oral Presentation Session 9<br><i>(Theme: Condition Monitoring, Prognostics &amp; Predictive Maintenance)</i><br>Chair: Dr. G. Saravana Kumar (IIT Madras),<br>Dr. Rahul Yadav (IIT Madras) |
|                          | 12:30 - 1:00 PM                        | Keynote 7:<br><i>(Remanufacturing and Demanufacturing)</i><br>Dr. Vignesh Vishnudas Shanbhag (NORCE, Norway)<br>Chair: Prof. K Hariharan                                                                                                                                          |                                                                                                                                                                  |                                                                                                                                                                                             |
|                          | 01:00 - 01:30 PM                       | Sponsored Company Presentations                                                                                                                                                                                                                                                   |                                                                                                                                                                  |                                                                                                                                                                                             |
|                          | 01:30 - 02:30 PM                       | Lunch Break                                                                                                                                                                                                                                                                       |                                                                                                                                                                  |                                                                                                                                                                                             |
|                          | 02:30 - 03:00 PM                       | Keynote 8:<br><i>(Development of Laser DED-based Autonomous Robotic Restoration Process)</i><br>Prof. Ramesh Singh (IIT Bombay)<br>Chair: Prof. Amitava Ghosh                                                                                                                     |                                                                                                                                                                  |                                                                                                                                                                                             |
|                          | 03:00 - 04:30 PM                       | Oral Presentation Session 10<br><i>(Theme: Cybersecurity)</i><br>Chair: Prof. GL Samuel (IIT Madras)<br>Dr. Aishwarya T (IIT Madras)                                                                                                                                              | Oral Presentation Session 11<br><i>(Theme: Intelligent Manufacturing Systems)</i><br>Chair: Mohit Law (IIT Kanpur),<br>Prof. SK Panigrahi (IIT Madras)           | Oral Presentation Session 12<br><i>(Theme: Industrial Digital Twins &amp; Autonomous Factories)</i><br>Chair: Prof. Asim Tiwari (IIT Bombay),<br>Prof. Palaniappan Ramu (IIT Madras)        |
|                          | 04:30 - 04:45 PM                       | High Tea Break                                                                                                                                                                                                                                                                    |                                                                                                                                                                  |                                                                                                                                                                                             |
|                          | 04:45 - 05:30 PM                       | Panel Discussion 2<br><i>(Topic: Closing the Loop: Why Digital Twins Struggle to Enable Real-Time Control and Autonomous Decisions)</i><br>Moderator: Prof. K. Hariharan<br>Panel Members: Prof. Sam Anand, Prof. Asim Tewari, Prof. Santhakumar Mohan, Dr. Suchetana Chakraborty |                                                                                                                                                                  |                                                                                                                                                                                             |
| 05:30 - 06:00 PM         | Group Photo                            |                                                                                                                                                                                                                                                                                   |                                                                                                                                                                  |                                                                                                                                                                                             |
| 6:00 PM Onwards          | Cultural Event followed by Gala Dinner |                                                                                                                                                                                                                                                                                   |                                                                                                                                                                  |                                                                                                                                                                                             |



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|                            |                  |                                                                                                                                                                                                                                                                                                        |                                                                                                                                                                    |
|----------------------------|------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Wednesday - 22nd July 2026 | Time             | TTJ, IC&SR                                                                                                                                                                                                                                                                                             | Hall 4, IC&SR                                                                                                                                                      |
|                            | 9:30 - 10:00 AM  | <b>Keynote 9:</b><br><i>(Experience with Establishing Digital Twins Related to Manufacturing)</i><br><b>Prof. Peter Gorm Larsen (Aarhus University)</b><br>Chair: Dr. Anil Meena                                                                                                                       |                                                                                                                                                                    |
|                            | 10:00 - 10:30 AM | <b>Keynote 10:</b><br><i>(Digital Twins in Manufacturing)</i><br><b>Mr. Aritra Kumar Ghosh (Mercedes Benz)</b><br>Chair: Prof. Somashekhar S. Hiremath                                                                                                                                                 |                                                                                                                                                                    |
|                            | 10:30 - 11:00 AM | High Tea Break                                                                                                                                                                                                                                                                                         |                                                                                                                                                                    |
|                            | 11:00 - 12:30 PM | <b>Oral Presentation Session 13</b><br><i>(Theme: Digital Twins for Smart Infrastructure, Energy and Industrial Applications)</i><br>Chair: Mr. Aritra Kumar Ghosh (Mercedes Benz),<br>Prof. Somashekhar S. Hiremath (IIT Madras)                                                                      |                                                                                                                                                                    |
|                            | 12:30 - 1:00 PM  | Sponsored Company Presentations                                                                                                                                                                                                                                                                        |                                                                                                                                                                    |
|                            | 01:00 - 02:00 PM | Lunch Break                                                                                                                                                                                                                                                                                            |                                                                                                                                                                    |
|                            | 02:00 - 02:30 PM | <b>Keynote 11:</b><br><i>(Leveraging Energy Digital Twins to Achieve Net-Zero and Reduce Industrial Power Costs in India)</i><br><b>Mr. Navin Manaswi (Department of Telecommunications, GoI)</b><br>Chair: Dr. Piyush Shakya                                                                          |                                                                                                                                                                    |
|                            | 02:30 - 03:15 PM | <b>Panel Discussion 3</b><br><i>(Topic: From Digital Twins to Living Systems: Self-Learning, Self-Healing, and Adaptive Manufacturing)</i><br><b>Moderator: Prof. Palaniappan Ramu</b><br><b>Panel Members: Prof. Peter Gorm Larsen, Prof. Ramesh Singh, Mr. Navin Manaswi, Mr. Aritra Kumar Ghosh</b> |                                                                                                                                                                    |
|                            | 03:15 - 03:30 PM | High Tea Break                                                                                                                                                                                                                                                                                         |                                                                                                                                                                    |
|                            | 03:30 - 04:30 PM |                                                                                                                                                                                                                                                                                                        | <b>Poster Presentation</b><br><i>(Theme: Digital Twin for Smart Manufacturing)</i><br>Reviewers: Dr. Navin Manaswi (DoT, GoI),<br>Prof. PV Manivannan (IIT Madras) |
|                            | 04:30 - 05:15 PM | Valedictory Session<br>(Prize Distribution)                                                                                                                                                                                                                                                            |                                                                                                                                                                    |



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## Oral Presentation Session 1 (Theme: Sensing & Communication Technologies)

Date: 20th July 2026 | Time: 12:30 - 1:30 PM

Venue: TTJ, IC&SR

| Paper ID | Presenter Name             | Affiliation                    | Title                                                                                                                                                           |
|----------|----------------------------|--------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 3590     | Vamsi Mallareddy           | IIT Madras                     | Design and Development of Test Platform for Electro-mechanical Characterisation of Triboelectric Sensors                                                        |
| 3177     | Shashi Bhushan Gunjan      | IIT Madras                     | RTD-Based Embedded Thermal Sensing and Displacement Estimation System for CNC Machine Tool Accuracy Improvement                                                 |
| 2621     | Prerit Sunil Shah          | BITS Pilani Hyderabad Campus   | A PCB Structural Health Monitoring Digital Twin Framework Integrating MPU-6050 IMU Sensing and Machine Learning for Real-Time Vibration Fatigue Life Prediction |
| 2572     | Dhakshinesh Anandh         | UPES, Bidholi, Dehradun        | VINS-Fusion-SAM: IMU-Gated Semantic Masking for Robust Visual-Inertial Odometry on Edge AI                                                                      |
| 2568     | Leema Christy Devasagayam  | Schneider Electric Ltd         | AI-Driven Software-Defined Architecture for Intelligent Power Quality Monitoring and Control                                                                    |
| 2898     | AMGAD HASSAN ALAMIN HASSAN | Delhi Technological University | Safety Constrained Energy-Latency Optimization for LoRaWAN in Remote Petroleum Field Monitoring                                                                 |

## Oral Presentation Session 2 (Theme: Computation Metrology & Machine Vision)

Date: 20th July 2026 | Time: 12:30 - 1:30 PM

Venue: Hall 3, IC&SR

| Paper ID | Presenter Name             | Affiliation                           | Title                                                                                                |
|----------|----------------------------|---------------------------------------|------------------------------------------------------------------------------------------------------|
| 3934     | RAMUNIVAGAIRA GNANAPRAKASH | IIT Tirupati                          | Proximity-Aware Human-Robot Collaboration: A Dynamic Safety Framework for Industrial Environments    |
| 3086     | Navodita Singh             | IISER, Bhopal                         | Digital Twin for Efficient Robotic Scanning using RGB-D Sensing                                      |
| 3055     | AYYAPPAN SELVARAJ          | VIT University Chennai                | Visibility-Aware YOLOv11 for Robust Real-Time Underwater Object Detection in Autonomous Surveillance |
| 3048     | Ramkumar K                 | PSG College of Technology, Coimbatore | A smart vision system to detect operation's anomalies in assembly lines                              |
| 3165     | Mohamed Farook K           | IIT Tirupati                          | Real Time Vision Based Casting Defect Detection                                                      |
| 2703     | Prashant Priyadarshi       | BIT Sindri, Dhanbad                   | A novel framework towards reshaping the CNN topology                                                 |

## Oral Presentation Session 3 (Theme: AI for Vision, Safety & Intelligent Monitoring)

Date: 20th July 2026 | Time: 12:30 - 1:30 PM

Venue: Hall 2, IC&SR

| Paper ID | Presenter Name       | Affiliation                                | Title                                                                                                                |
|----------|----------------------|--------------------------------------------|----------------------------------------------------------------------------------------------------------------------|
| 4812     | VIGNESH M            | NITTTR, Chennai                            | Gesture-Based AI Safety Monitoring and Fault Detection for Machine Operators Using Edge AI and Human Pose Estimation |
| 3135     | Lavanya A            | NIT Puducherry                             | Stability-Based Degradation Trend Modeling for RUL Prediction of Broken Rotor Bar Faults                             |
| 3140     | Rajadurai S          | Meenakshi sundararajan engineering College | CLIP-Based Zero-Shot Visual Twin for Manufacturing                                                                   |
| 3072     | SURYAJITH S S        | College of Engineering Trivandrum          | Real Time Distortion Monitoring During Welding of Structures Using Image Processing Techniques                       |
| 3114     | Abhishek Shrivastava | IIT Madras                                 | Investigation of Failure and Progressive Wear in Carbide Micro-Drills via Acoustic Emission Signal Analysis          |



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## Oral Presentation Session 4 (Theme: Advanced Manufacturing & Additive Technologies)

Date: 20th July 2026 | Time: 3:00 - 4:30 PM)

Venue: TTJ, IC&SR

| Paper ID | Presenter Name       | Affiliation                                | Title                                                                                                                                                    |
|----------|----------------------|--------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------|
| 3820     | Vipesh Singh         | IIT Madras                                 | Acoustic Levitation and Passive Rotation of Planar Objects Using Perforated Vibrating Plates                                                             |
| 3755     | M Amarnath           | IIITDM, Jabalpur                           | Enhancement in Mechanical Properties and Microstructural Investigation of Aluminium alloy 2024 using Microwave Hybrid Processing                         |
| 3092     | Eshan Amalnerkar     | ESTECO Software India Pvt. Ltd.            | Towards Automated Structural Performance Optimization: Multi-Objective Design of a BIW Front Subframe with Coupled Shape Morphing and Stress Constraints |
| 2899     | D MALLIKARJUNA REDDY | VIT, Vellore                               | Geometric Influences on Compressive Performance of Additively Manufactured Gyroid Cellular Architectures                                                 |
| 3168     | Aravindh Raj B R     | Indian Institute of Information Technology | Mechanical Performance of PETGCF-Based Sandwich Lattice Metamaterials Fabricated Using Fused Filament Fabrication                                        |
| 3167     | Shishir Kasturi      | VNRVJiet                                   | Process Parameter Optimization of PETG-CF 3D Printing Using Machine Learning                                                                             |
| 2404     | K. Prabhakar Sriram  | Delhi Technological University (DTU-DCE)   | Six Sigma Application to Precision Instrument Manufacturing Facility for Defect Reduction: A Case Study                                                  |
| 2647     | Rajalakshmi K        | Sri Sai Ram Engineering College            | IIoT-Based Smart Steam Management for Deodorization Efficiency in Refineries                                                                             |

## Oral Presentation Session 5 (Theme: Robotics & Automation Systems)

Date: 20th July 2026 | Time: 3:00 - 4:30 PM)

Venue: Hall 3, IC&SR

| Paper ID | Presenter Name        | Affiliation                     | Title                                                                                                                                                              |
|----------|-----------------------|---------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 3778     | Sakshi Jha            | The Neotia University           | Design and Conceptual Development of a Trunk-Mounted End-Effector for Autonomous Rubber Tapping                                                                    |
| 2655     | Dr. J. Ronald Aseer   | BIT Puducherry                  | Lightweight Robotic Gripper Finger Design Using Generative Approach                                                                                                |
| 2628     | Rituraj Bhattacharjee | MIT, Manipal                    | Design and Experimental Evaluation of an Autonomous Water Surface Cleaning Robot                                                                                   |
| 2623     | Rajashekhar V S       | IIT Kanpur                      | Module Fabrication and Mixed Reality Based Control of a Soft Snake Robot                                                                                           |
| 3014     | Anitha N              | IIIT, Tiruchirappalli           | Performance Analysis of Discrete-Time Sliding Mode Control with Field-Oriented Current Regulation for PMSM Servo Drive under Variable Load in Robotics Application |
| 3109     | Puja Appasaheb Thorat | Sanjivani University, Kopergaon | Development of an Autonomous Mobile Robot for Warehouse Application: A Review                                                                                      |
| 3154     | Ritvik Ravi           | IIT Tirupati                    | Real-Time Ergonomic Risk-Driven Human-Cobot Task Reallocation via Edge AI: An Industry 5.0 Framework with Economic Impact Quantification                           |

## Oral Presentation Session 6 (Theme: Digital Twins for Robotics & Autonomous Manufacturing)

Date: 20th July 2026 | Time: 3:00 - 4:30 PM)

Venue: Hall 2, IC&SR

| Paper ID | Presenter Name   | Affiliation                                  | Title                                                                                                                    |
|----------|------------------|----------------------------------------------|--------------------------------------------------------------------------------------------------------------------------|
| 4687     | M Selvakumar     | IIT Madras                                   | Fidelity Mesh: Quantifying the Effect of URDF Geometric Fidelity on Autonomous Mobile Robot Digital Twin                 |
| 4468     | Monica Srinivas  | VIT                                          | A Lightweight Web-Based Dashboard for Real-Time Monitoring and Control of Autonomous Mobile Robot Digital Twins          |
| 3117     | Bhuvanesh P S    | Madras Institute of Technology               | Design and Development of a Digital Twin-Based Autonomous Mobile Robot with Real-Time Path Adaptation                    |
| 2625     | Uttam Agarwal    | BITS Pilani Hyderabad Campus                 | Development of a Real-Time UAV Digital Twin for Cyber-Physical Monitoring and Visualization                              |
| 3041     | Dr. VELMURUGAN C | IIIT, Tiruchirappalli                        | Development of a Real-Time Digital Twin Framework for Robotic Material Handling Systems in an Industrial Production Line |
| 3090     | Sreejith S       | Cambridge Institute of Technology, Bengaluru | A Predictive Digital Twin for GNSS-Denied UAV Navigation                                                                 |



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## Oral Presentation Session 7 (Theme: AI & ML for Smart Manufacturing)

Date: 21st July 2026 | Time: 11:30 - 12:30 PM)

Venue: TTJ, IC&SR

| Paper ID | Presenter Name      | Affiliation                          | Title                                                                                                               |
|----------|---------------------|--------------------------------------|---------------------------------------------------------------------------------------------------------------------|
| 3207     | Rakesh Verma        | IIT Madras                           | Real-Time FPGA Edge Integration for High-Fidelity Chatter Control                                                   |
| 3200     | Harshvardhan Kharat | IIT Madras                           | Adaptive Maintenance of Wind Turbine Gearboxes Using Digital Twin- Inspired Simulation                              |
| 3170     | Abhishek Punia      | IIT Guwahati                         | Physics-Guided Neural Network for Cutting Force Prediction in Turning                                               |
| 3150     | Rakesh Verma        | IIT Madras                           | A Three-Layer Cyber-Physical System for a Boring Tool to Monitor and Predict Chatter During Machining               |
| 3775     | Karthik M           | Vidyavardhaka College of Engineering | A Hybrid Contextual Reasoning Architecture for Fully Offline Conversational AI on Resource-Constrained Edge Devices |
| 2664     | Dr. Rahul Kumar Ray | FLAME University                     | SMRITI: A Smart Manufacturing Reasoning Interface for Twin Integration using LLM-Enhanced Explainable AI            |

## Oral Presentation Session 8 (Theme: Physics-based Modeling & Simulation)

Date: 21st July 2026 | Time: 11:30 - 12:30 PM)

Venue: Hall 3, IC&SR

| Paper ID | Presenter Name        | Affiliation          | Title                                                                                                                                                        |
|----------|-----------------------|----------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 4338     | Akash K               | IIT Madras           | Development of a Physics-Based Digital Twin Framework for the CNC End Milling Process                                                                        |
| 3178     | Patel Kunj Ketankumar | IIT Madras           | Physics-Based Digital Twin Development for Polymer Fused Filament Fabrication 3D Printing                                                                    |
| 3196     | Sneha Anand           | IIT Madras           | Adaptive Robotic GMAW Welding Simulation with DDPG Reinforcement Learning, Physics-Based Bead Geometry, and Gap-Adaptive Control for Marine Hull Fabrication |
| 3120     | Mourya Konathala      | IIT Madras           | Firmware-Native Industrial Digital Twin for Thermo-Kinetic Geometric Drift Estimation and Compensation in Smart Fused Deposition Modeling                    |
| 2990     | Mohammed Abdul Razzaq | VIT                  | A Comprehensive Study on Streamlining Backward Facing Step Flow Simulation Using the PyAnsys Framework                                                       |
| 2890     | Kiran Wakchaure       | Sanjivani University | Development of Digital Twin Framework for Compound Pendulum Experimentation empowered with IoT and Augmented Reality                                         |

## Oral Presentation Session 9 (Theme: Condition Monitoring, Prognostics & Predictive Maintenance)

Date: 21st July 2026 | Time: 11:30 - 12:30 PM)

Venue: Hall 2, IC&SR

| Paper ID | Presenter Name                | Affiliation                                | Title                                                                                                                                                |
|----------|-------------------------------|--------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------|
| 3604     | Mahesh Babu N                 | IIT Madras                                 | Adaptive Optimization of Surface Roughness in CNC Milling using Experimental Machining Data                                                          |
| 4458     | Syed Ismail Sultan            | IIT Kanpur                                 | Development of a Real-Time Digital Twin Framework for Autonomous Monitoring and Control of a Motorized Spindle                                       |
| 3121     | R.DHANALAKSHMI                | MIT, Anna University, Chennai              | Smart Manufacturing Approach For Rotating Shaft Fault Detection Using Digital Twin And Vibration Analysis                                            |
| 3156     | Jaikrishna R                  | Meenakshi Sundararajan Engineering College | Smart Factory Predictive Maintenance Hub: An Edge-to-Cloud Architecture for RUL Prediction and Fault Classification in Rotating Industrial Machinery |
| 2560     | Abdelhalim Mohamed Hassan Ali | Delhi Technological University             | Physics-Informed Digital Twin for Bearing RUL Prediction with Bi-LSTM                                                                                |
| 2698     | DOMINIC SANJU JAMES R         | BITS, Hyderabad                            | Dual-Fault Diagnosis in Single-Stage Spur Gear Systems                                                                                               |



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## Oral Presentation Session 10 (Theme: Cybersecurity)

Date: 21st July 2026 | Time: 3:00 - 4:30 PM)

Venue: TTJ, IC&SR

| Paper ID | Presenter Name         | Affiliation                        | Title                                                                                                                                                    |
|----------|------------------------|------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------|
| 3164     | Palak Aggarwal         | Doon University                    | Robustness Analysis of Federated Learning Defenses Against Local Model Poisoning Attacks                                                                 |
| 3003     | Harish Mrithyunjayan S | Bharathiar University              | A Digital Twin-Based Cybersecurity Framework for G-code Anomaly Detection in Additive Manufacturing Systems                                              |
| 3015     | SIDDESH R              | Bharathiar University, Coimbatore. | AI-Based Cybersecurity Framework for Anomaly Classification in an Autonomous Factory Using a Confidence Weighted Voting Ensemble of SALSTM, TCN, and DBN |
| 2893     | Deepa Jose             | KCG College of Technology          | Multi-Sensor Orchestrated Cyber Physical System Interactive Framework using Digital Twin for Secure Vehicular Networks                                   |
| 3146     | Thulasi M Santhi       | NIT Tiruchirappalli                | Digital Twin-Integrated Attack Detection Framework for Adaptive Cruise Control in Cyber-Physical Vehicle Networks                                        |
| 3163     | Deepthi Joshi          | Doon University                    | A stable and reliable defense mechanism for detecting label-flipping attacks in federated learning                                                       |
| 3162     | Ayush Maindola         | Doon University                    | A Secure and Robust Federated Learning Framework for Detecting and Mitigating Anonymous Free-Rider Attacks                                               |
| 2518     | Nagharajhan K P K      | Independent Researcher             | A DPDP-Compliant Edge AI Human Digital Twin Using Physics-Driven ODE and Adaptive Reinforcement Learning                                                 |

## Oral Presentation Session 11 (Theme: Intelligent Manufacturing Systems)

Date: 21st July 2026 | Time: 3:00 - 4:30 PM)

Venue: Hall 3, IC&SR

| Paper ID | Presenter Name           | Affiliation                                 | Title                                                                                                                                                         |
|----------|--------------------------|---------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 3472     | Swathy S                 | Cochin University of Science and Technology | Dynamic Beam Shaping using Coherent Beam Combining                                                                                                            |
| 3246     | Ankush Goyal             | Bennett University                          | Capsule-Enhanced Generative Adversarial Networks for Financial Time Series: A Comparative Study of RNN Architectures and Mamba                                |
| 3119     | G. Devasena              | IIIT, Tiruchirappalli                       | Impact of Multimodal LLMs and Agentic AI in Smart Manufacturing – a systematic review                                                                         |
| 3123     | Brijith Jacob            | Cochin University of Science and Technology | Developing a Generative DTDL Framework for Smart Manufacturing                                                                                                |
| 3149     | Avantika V               | Meenakshi Sundararajan Engineering College  | Tiny ML-Compatible Lightweight Physics-Informed Digital Twin for Edge Systems: A Simulation Study with Exploratory Federated Unlearning                       |
| 3136     | Anurag Nandkumar Bansode | IIIT, Tiruchirappalli                       | Designing a Distributed Ledger-Enabled Trust-Aware Federated Learning Framework for Auditable Backdoor Detection in Collaborative Intrusion Detection Systems |
| 3132     | Abirami J                | Meenakshi Sundararajan Engineering College  | Autoencoder-Driven Prediction-Error Triggered Digital Twin Synchronization on TinyML Edge Nodes for Bandwidth-Efficient IIoT Predictive Maintenance           |
| 3066     | ALI MOHAMED ALI ELSHAREF | Delhi Technological University (DTU)        | Low-Power AI Inference Accelerator: MAC Unit Optimization via Operand Isolation and Switching Activity Reduction                                              |

## Oral Presentation Session 12 (Theme: Industrial Digital Twins & Autonomous Factories)

Date: 21st July 2026 | Time: 3:00 - 4:30 PM)

Venue: Hall 2, IC&SR

| Paper ID | Presenter Name      | Affiliation                             | Title                                                                                                                                      |
|----------|---------------------|-----------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------|
| 3180     | ANIRBAN TUDU        | IIT Madras                              | A Real-Time Virtual Reality-Based Digital Twin Framework for Thermal Error reduction of Machine Tool Spindles                              |
| 3118     | Senthil Sivakumar M | IIIT Tiruchirappalli                    | Integration of 3D Printing, AI, and IoT for Smart Manufacturing towards Automation for Industry 4.0: A Review                              |
| 2701     | Vijayakumar         | SRM Institute of Science and Technology | Orchestrating Industrial Complexity: A Proposed Human-Swarm Interaction Framework for Agentic Business Process Digital Twins               |
| 2979     | Sharon Blessy       | IIIT Tiruchirappalli                    | Phased Integration of 5G Technology in a Digital Twin-Based Autonomous Factory                                                             |
| 3166     | SURAJ KUMAR         | IIT Bombay                              | Real-Time Chatter Detection and Adaptive Control in High-Speed Micromilling Using Normalized Spectral Entropy and Spindle Speed Regulation |
| 3115     | Ashish Mehta        | IIT Madras                              | From P&IDs to Knowledge Graphs: Enabling Process Intelligence through Digitization                                                         |
| 3158     | N V Jatin Pochiraju | SRM Institute of Science and Technology | Metaverse-Based Digital Twin of a Smart e-Yantra Laboratory for Industrial IoT and Smart Manufacturing Applications                        |



# International Conference on Industrial Digital Twins for Smart Manufacturing (ICIDTSM 2026)

20-22 July 2026, IC&SR, IIT Madras



**Oral Presentation Session 13 (Theme: Digital Twins for Smart Infrastructure, Energy and Industrial Applications)**  
**Date: 22nd July 2026 | Time: 11:00 - 12:30 PM)**  
**Venue: TTJ, IC&SR**

| Paper ID | Presenter Name            | Affiliation                            | Title                                                                                                                                        |
|----------|---------------------------|----------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------|
| 3100     | Dhivya K                  | VIT                                    | ABSA-GraphRec:Perception-Aware Constraint Learning via LLM Enhanced Aspect Sentiment for Graph-Based Tourism Recommendation                  |
| 2709     | Samuel Mathias Menezes    | Padre Conceicao college of Engineering | Digital Twin of Mechanical Machines using Unity                                                                                              |
| 2663     | Annie Alex                | VIT, Chennai                           | Synergizing Multi-Source Energy Management: An Intelligent, Unified Architecture for Next-Generation Electric Vehicles                       |
| 2659     | Richie Garg               | Schneider Electric                     | AI-Driven Testpoint Prediction and Digital Twin Integration for Calibration Process Optimization in Smart Metering Devices                   |
| 2656     | HARISH MUTHU S            | BITS, Hyderabad                        | A Digital Twin Framework for Vibration-Based Condition Monitoring of a Single-Stage Spur Gearbox                                             |
| 2606     | Shriiraam Satish          | Bharathidasan Institute of Management  | A Distributed Sensor Network-Based Digital Twin for Real-Time Environmental Monitoring and Intelligent Decision Support in Indoor Workspaces |
| 2605     | Chakhyusa Saisrita Mittra | VIT, Chennai                           | Digital Twin-Enabled Smart Grid for Hybrid Renewable Energy Integration with Self-Powered Sensing and Advanced Storage                       |



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Poster Session (Theme: Digital Twin for Smart Manufacturing)  
Date: 22nd July 2026 | Time: 3:30 - 4:30 PM  
Venue: Hall 4, IC&SR

| Paper ID | Presenter Name         | Affiliation                                | Title                                                                                                                                                |
|----------|------------------------|--------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------|
| 3733     | HAMSASHREE S           | NIT Puducherry                             | Deep Learning Enabled Microstructure–Property Correlation in A356 Aluminium Alloy: Focus on Silicon Refinement and Grain Globularity by GIPUC Method |
| 3458     | Clement Rufus Raj A    | Central University of Tamil Nadu           | Leveraging Aluminum 6061 for a Sustainable circular economy via powder Metallurgy by Integrating Machine Learning                                    |
| 3229     | Shiwam Shorya Sharma   | IITM Pravartak Technologies Foundation     | Cloud-Enabled Digital Twin Framework of an Industrial Robot for Seamless Integration and Task Automation in Autonomous Factories                     |
| 3228     | Manikala Prem Sainadh  | NIT Puducherry                             | Machine Learning based Fault Diagnostics for Industrial Robots using Accelerometer Signals                                                           |
| 3204     | V Aruna                | IIT Madras                                 | Automated Painting of Aerospace Components: An end to end pipeline from STL geometry to coordinated robot execution                                  |
| 3198     | Arshiya Singh          | VIT, Chennai                               | Bubble Detection and Parameter Optimisation for Sterile Vial Filling                                                                                 |
| 3159     | KALAIYARASAN R         | NIT Tiruchirappalli                        | Tribological Behavior of Wire Arc Additive Manufactured Super Duplex Stainless Steel using Laser Shock Peening                                       |
| 3151     | Srihari Prasad         | IIT Madras                                 | AI-Based Predictive Maintenance Framework for Wind Turbine using real-time SCADA Data                                                                |
| 3107     | Prabhu Ram N           | IIT Madras                                 | Development and Implementation of ROS 2 Architecture for Differential Drive Indoor AMRs                                                              |
| 2674     | PORRKODI M             | Central University of Tamil Nadu           | Additive manufacturing Of Casting Tooling                                                                                                            |
| 3079     | Jeevika Kannan         | Meenakshi Sundararajan Engineering College | Multimodal Tutor Kit for Blind Children                                                                                                              |
| 2557     | G. Anitha              | R.M.D Engineering College                  | Smart Prescription-Based Automated Medicine Dispenser                                                                                                |
| 3101     | Loganathan, Velayutham | TTANI.AI                                   | AI RESEARCH- AUTONOMOUS CEMENT PLANT OPERATIONS                                                                                                      |
| 2498     | Ajithkumar A           | Shinkai-labs.Pvt.Ltd.                      | Multi-Domain Digital Twin Framework for Real-Time Monitoring and Object Identification Across Air, Sea, and Ground Domains                           |