

**A Report on**  
**AICTE Sponsored Distinguished Professional Scheme (DPS) one-day Technical**  
**Talk on**  
**“Recent Advancements in Remote Robotic Surgeries using Digital Twins”**  
**Organized by Department of Computer Science & Engineering- Artificial**  
**Intelligence**  
**on 10.03.2026**



**Report Submitted by: Dr. Rampriya R, Assistant Professor, Department of Computer Science & Engineering (Artificial Intelligence)**

**Resource Person Details: Dr. T. Venkata Prabhakar, Chief Research Scientist, Indian Institute of Science (IISc), Bangalore**

**Venue: Scaleup Room & Seminar Hall – B**

**Time: 9:00 AM - 5:00 PM**

**Mode of Conduct: Offline.**

**Attendees Count: 50 (Fore Noon - Faculty) and 450 (After Noon – Student)**

**Report Received on 23.03.2026.**

**Objective of the Program:**

- To create awareness among students and faculty about recent advancements in Digital Twin technology and remote robotic surgeries.
- To introduce emerging technologies such as Artificial Intelligence, 3D Printing, and Digital Twins and their applications in industry and healthcare.
- To encourage digital transformation and adoption of modern technologies by future engineers and researchers.
- To enhance technical knowledge and skills of students in advanced computing and innovative engineering practices.
- To motivate students to explore research opportunities and develop solutions using affordable and open-source technologies.

**Event details:**

The Department of Computer Science and Engineering (Artificial Intelligence) at Madanapalle Institute of Technology & Science (MITS) successfully organized a One-Day Technical Talk titled “IoT-Driven Industrial Automation: Robotics, Sensors, and Communication Technologies” on March 10, 2026. The event was conducted under the AICTE Sponsored Distinguished Professional Scheme (DPS). The program commenced at 09:30 AM with an introduction by Dr. Rampriya R, Event Coordinator. Dr. R. Kalpana, Head of the Dept. of CSE (AI), delivered the Welcome Address, highlighting the transformative role of AI and robotics in healthcare. Dr. P. Ramanathan, Principal, followed with the Presidential Address, urging interdisciplinary research. Dr. K. Hemalatha then introduced the Chief Guest, Dr. T. Venkata Prabhakar.



The faculty session was delivered by Dr. T. Venkata Prabhakar, who provided an in-depth explanation of the technological infrastructure supporting remote robotic surgery using Digital Twin technology. During the session, he demonstrated a testbed connecting Bengaluru and Chennai, covering a distance of approximately 400 kilometers. This experimental setup illustrated how advanced networking technologies enable surgeons to perform operations remotely with high precision and reliability.

He explained the role of TSN (Time-Sensitive Networking) in ensuring reliable, low-latency communication between the remote surgical system and the control interface. This technology enables real-time data transmission, which is critical for medical applications where delays or interruptions could affect surgical outcomes. Along with TSN, Haptic Devices were demonstrated, which allow surgeons to receive tactile feedback while operating robotic instruments remotely. This feedback mechanism helps surgeons feel resistance and movement, closely replicating the sensation of performing surgery directly.

A key highlight of the session was the explanation of Digital Twin models. The speaker described how digital twins create a virtual replica of physical systems, allowing continuous monitoring, simulation, and analysis of surgical procedures. These virtual models enable doctors and engineers to test and optimize surgical operations in a simulated environment before applying them in real-world situations, thereby improving safety and efficiency.

The session also addressed the human factors involved in interacting with advanced technological systems. Dr. T. Venkata Prabhakar discussed how professionals learn and adapt to complex automated interfaces by considering different types of cognitive load. He explained the concepts of Intrinsic Load, Extraneous Load, and Germane Load, which influence how effectively individuals process information and develop expertise when working with advanced technologies.



Overall, the faculty session provided valuable insights into the integration of advanced networking, robotics, digital twin technology, and human cognitive factors in modern healthcare systems. The discussion enabled faculty members to better understand the technological and educational aspects of remote robotic surgery and its potential impact on future medical and engineering applications.

The morning session concluded with a Vote of Thanks delivered by the Dr. K. Chokkanathan, Assoc. Professor / CSE(AI) expressing gratitude to the MITS management and the distinguished resource person for their guidance.

In the afternoon, the student session commenced with a brief introduction highlighting the significance of digital transformation and advanced computing technologies in addressing real-world challenges. The resource person emphasized how industries, especially Micro, Small and Medium Enterprises (MSMEs), are progressing in the value chain by adopting modern digital technologies and innovative solutions to enhance productivity and competitiveness.

The resource person also discussed the role of affordable and open technologies in supporting innovation. Many advanced technological tools and platforms are now available as open-source or low-cost solutions, enabling students, researchers, and startups to experiment and develop new applications without significant financial barriers.

Another important aspect of the talk was the emphasis on awareness and skill development. The speaker pointed out that awareness of emerging technologies is the first step toward innovation. He encouraged students to explore new materials, modern techniques, and advanced computing methods to develop practical solutions for real-world challenges.

Furthermore, the importance of skilling and continuous learning was stressed. The speaker motivated students to develop strong technical skills in areas such as Artificial Intelligence, data analytics, simulation technologies, and digital engineering. According to the speaker, these skills are essential for future engineers to contribute effectively to industries and research. Overall, the technical talk was highly informative and inspiring. It helped students and faculty gain a deeper understanding of modern technological trends, digital innovation, and future career opportunities in advanced computing and engineering domains.

**Outcomes of the Event**

1. Enhanced knowledge of Digital Twin technology and its role in remote robotic surgeries and modern industries.
2. Increased awareness of emerging technologies such as Artificial Intelligence, TSN, and haptic Devices.
3. Better understanding of real-time remote operation and low-latency communication systems.
4. Motivation among students and faculty to pursue research and innovation in advanced computing and healthcare technologies.

**Program Outcomes (POs) Covered**

1. **PO1 – Engineering Knowledge:** Application of advanced computing concepts like Digital Twins, AI, and networking in real-world scenarios.
2. **PO2 – Problem Analysis:** Understanding and analyzing challenges in remote robotic surgeries and digital systems.
3. **PO3 – Design/Development of Solutions:** Exposure to designing innovative solutions using modern technologies and simulation models.
4. **PO5 – Modern Tool Usage:** Use of advanced tools such as Digital Twin platforms, TSN, and haptic devices.
5. **PO12 – Life-long Learning:** Encouragement to continuously learn and adapt to emerging technologies and interdisciplinary fields.

**SDG Goals Aligned with the Event**

1. **SDG 3 – Good Health and Well-being:** Promotes advancements in healthcare through remote robotic surgeries and improved medical technologies.
2. **SDG 4 – Quality Education:** Enhances knowledge and technical skills of students and faculty in emerging technologies and interdisciplinary learning.
3. **SDG 9 – Industry, Innovation, and Infrastructure:** Encourages innovation through the adoption of Digital Twin technology, AI, and advanced networking systems.
4. **SDG 8 – Decent Work and Economic Growth:** Supports digital transformation in industries, especially MSMEs, leading to improved productivity and economic growth.

**Conclusion:**

The one-day technical talk on “Recent Advancements in Remote Robotic Surgeries using Digital Twins” was highly informative and insightful for both faculty and students. The session successfully highlighted the significance of Digital Twin technology, advanced networking, and robotic systems in transforming modern healthcare and industrial practices. The resource person effectively demonstrated real-time applications and explained complex concepts in a clear and understandable manner, enabling participants to gain practical knowledge. The discussion on cognitive aspects of learning and interaction with advanced systems further enriched the session. Overall, the program achieved its objective of creating awareness about emerging technologies and motivating participants to explore research and innovation. The event proved to be a valuable platform for knowledge sharing and inspired attendees to adopt advanced technological solutions in their academic and career endeavors.

**Newspaper Clips:**

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**డిజిటల్ ట్విన్ టెక్నాలజీతో రోబోటిక్ శస్త్రచికిత్సలలో గణనీయమైన పురోగతి**

- మిట్స్ యూనివర్సిటీలో ఒకరోజు సాంకేతిక ఉపన్యాసం

రంగంలో ఇటీవలి కాలంలో గణనీయమైన పురోగతి కనిపిస్తోందన్నారు. డిజిటల్ ట్విన్ అనేది రోగి శరీర భాగాల యొక్క వాస్తవ స్థితిని ప్రతిబింబించిన వర్చువల్ సమానా అని, ఈ సమానా సహాయంతో వైద్యులు శస్త్రచికిత్సకు ముందు కంప్యూటర్లోనే ప్రక్రియను అనుకరించి, అత్యంత ఖచ్చితంగా ప్రణాళిక రూపొందించగలగన్నారు. ఈ విధానం ద్వారా శస్త్రచికిత్స సమయంలో ప్రమాదాలను తగ్గించడం, ఖచ్చితత్వాన్ని పెంచడం సాధ్యమవుతుందని తెలిపారు. బెంగళూరు మరియు చెన్నై మధ్య సుమారు 400 కిలోమీటర్ల దూరంలో ఉన్న వ్యవస్థను నెట్వర్క్ మరియు హ్యాప్టిక్ పరికరాల ద్వారా అనుసంధానించి, వైద్యులు దూరం నుండి శస్త్రచికిత్సలు చేయగల విధానాన్ని వివరించారు. డిజిటల్ ట్విన్ వ్యవస్థలు శస్త్రచికిత్స సమయంలో రోగి శరీర పరిస్థితులను నిరంతరం విశ్లేషిస్తూ వైద్యులకు రియల్-టైమ్ సమాచారాన్ని అందిస్తాయి. దీనివల్ల శస్త్రచికిత్స మరింత సురక్షితంగా వెగంగా, ఖచ్చితంగా చేయడం సాధ్యమవుతోంది. అలాగే, ఈ

విచ్చాళిత వైద్య విద్య శిక్షణ మరియు శస్త్రచికిత్స ప్రణాళికలో కూడా ముఖ్యమైన పాత్ర పోషిస్తోంది. డిజిటల్ ట్విన్ టెక్నాలజీ రోబోటిక్ వ్యవస్థల కలయికతో భవిష్యత్తులో వైద్య రంగం మరింత అభివృద్ధిగా మారే అవకాశం ఉందని, విద్యార్థులు అధ్యాపకులు భవిష్యత్తు వైద్య సాంకేతికతల అభివృద్ధికోసం మరి శోధనలకు ముందుకు రావాలని సూచించారు. ఈ కార్యక్రమంలో ట్రాన్స్ఫార్మ్ డాక్టర్ పి. రామనాథన్, విభాగాధిపతి డాక్టర్ ఆర్. కల్పనా కో-ఆర్డినేటర్ డాక్టర్ ఆర్. రామప్రియా, కో-ఆర్డినేటర్ డి. విశ్వనాథ్, డాక్టర్ నాగభాగనీ, అధ్యాపకులు మరియు విద్యార్థులు పాల్గొన్నారు.

