



NEW HORIZON COLLEGE OF ENGINEERING

New Horizon Knowledge Park, Ring Road, Marathalli
Autonomous College Permanently Affiliated to VTU, Approved by AICTE & UGC
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DEPARTMENT OF MECHANICAL ENGINEERING

Expert Lecture Report

Title: Synergizing Robotics and 3D Printing: Transforming Manufacturing and Automation for the Future

Date: 21-11-2024 [11 am to 1.00 pm]

Expert Speaker: Mr. Narasimha Naidu

Founder & CEO, STEMx

Attendees: 7th Semester Industry 4.0 Open Elective Students

Overview:

This session was organized for the 7th-semester students, Industry 4.0 open elective course. The talk aimed to explore how the combination of robotics and 3D printing is revolutionizing modern manufacturing processes and automation, particularly in the context of Industry 4.0.

Key Topics Covered:

1. Introduction to Robotics and 3D Printing in Industry 4.0:

- Overview of the role of robotics and 3D printing as integral components of Industry 4.0, which emphasize automation, data exchange, and intelligent manufacturing.
- Explanation of how these technologies are facilitating smarter factories, optimized production processes, and agile supply chains.

2. The Synergy Between Robotics and 3D Printing:

- Discussed the complementary nature of robotics and 3D printing, demonstrating how the integration of both technologies leads to higher precision, efficiency, and reduced production times in manufacturing.
- Examples were provided on how this synergy can drive innovations in mass customization, additive manufacturing, and automated assembly lines.

3. Applications of Robotics and 3D Printing in Industry:

- Real-world case studies were shared, showcasing the applications of robotics and 3D printing in industries such as automotive, aerospace, medical devices, and consumer goods.

4. AI and Machine Learning in Advancing Robotics and 3D Printing:

- Insights were shared on how artificial intelligence (AI) and machine learning (ML) are accelerating the capabilities of robotics and 3D printing in manufacturing, including improvements in decision-making, predictive maintenance, and process optimization.

5. Challenges and Future Trends in Manufacturing:

- The challenges faced when implementing robotics and 3D printing, such as the high upfront cost, the need for skilled personnel, and the complexity of system integration was discussed

- He also shared exciting future trends, including the shift towards smart factories, autonomous systems, decentralized production, and the growing importance of sustainable manufacturing practices.
- 6. Hands-On Demonstrations and Case Studies:**
- Practical demonstrations were provided, showing how 3D printers and robotic systems work in tandem to produce complex parts and execute automated processes.
 - Case studies were presented, demonstrating how companies have used these technologies to enhance their manufacturing processes, reduce waste, and improve product quality.

Student Engagement

The session sparked intense interest and active participation among the students, many of whom asked insightful questions regarding the implementation of robotics and 3D printing in real-world manufacturing scenarios. Students were particularly intrigued by how these technologies would influence future job opportunities in the evolving landscape of Industry 4.0



Fig: Glimpse of the Lecture

Feedback

Post-lecture feedback highlighted students' enthusiasm for robotics and 3D printing. They expressed a strong interest in learning more about these technologies and their practical applications in various sectors.

Conclusion

The expert talk by Mr. Narasimha Naidu successfully illuminated the powerful role that robotics and 3D printing play in transforming manufacturing and automation processes, particularly within the framework of Industry 4.0. Students left the talk with a broader perspective on how these technologies will shape the future of industrial automation, providing them with the knowledge and inspiration to explore and apply these innovations in their future careers as engineers.