DEPARTMENT OF

AUTOMATION AND ROBOTICS

SITP-NEWSLETTER-MARCH'25

"INNOVATIVE ROBOTICS FOR A BETTER TOMORROW"

EDITORIAL

The Diploma Programme, Automation and Robotics, comprises two main areas: (1) Automation, which deals with use of computers or robots, and information technologies for handling different processes and machineries in an industry and (2) Robotics, which combines construction, operation, and application of robots coupled with computer-based control systems, sensory feedback, and information processing. This is a discipline that gives equal emphasis on hardware as well as software development. Hence the curriculum of this Diploma Program gives emphasis on Basics of Robotics, Robotic Programming, Sensors and Actuators used in Automation and Robotics, electronics, electrical controls & components such as servo systems, hydraulics & pneumatics, Automation tools such as PLC, SCADA, DCS etc.

MESSAGE FROM HOD

Mr . A . K. Magdum.
Head of Department
Automation and Robotics

Welcome to the Department of Automation and Robotics, established in 2021-22 with 60 students. Approved by the All India Council for Technical Education and affiliated with the Maharashtra State Board of Technical Education, our program aligns with the "Make in India" movement. Our Diploma Programme covers both Automation & Robotics and has become one of the top career choices among the aspirants. Automation & Robotics is an interdisciplinary branch that amalgamates various fields of Engineering, including Mechanical, Electronics, Computer sci, Sensors and Instrumentation, Industrial Automation, Artificial Intelligence and Machine learning, Nanotechnology, BioEngineering, Machine Vision, and many more. Our faculty and well-equipped labs ensure students gain essential technical skills. Practical exposure through industrial training, visits, and expert lectures is a priority. We also focus on overall personality development through co-curricular and extracurricular activities. The Department is committed to preparing students for industry challenges, ensuring a bright future for all.

WHAT'S INSIDE

DEPARTMENTS VISION

To produce professionally sound Automation and Robotics engineers with ethical values by strengthening their skill sets.

DEPARTMENTS MISSION

- To Provide Quality education through an effective teaching-learning process to meet the industry requirements.
- To apply Automation and Robotics engineering knowledge for the benefit of society.
- To provide a platform for the overall personality of students with professional ethics, social awareness, and moral values.

PROGRAM EDUCATIONAL OBJECTIVES (PEOS)

PEO 1. Provide socially responsible, environment-friendly solutions to Automation and Robotics engineering-related broad-based problems adapting professional ethics.

PEO 2. Adapt state-of-the-art Automation and Robotics engineering broad-based technologies to work in multi-disciplinary work environments.

PEO 3. Solve broad-based problems individually and as a team member, communicating effectively in the world of work.

PROGRAM SPECIFIC OBJECTIVES (PSOS)

PSO1. Maintain various types of Automation and Robotics equipment. **PSO2.** Apply basic computing knowledge and related software for implementing and operating Automation and Robotics systems.

DEPARTMENTS PROFILE

Location: D wing Top floor

Total number of Classrooms: 01

Total number of Laboratories: 05

Total Faculty: 07

Supporting Technical Staff: 02

DEPARTMENTAL ACTIVITIES

Apart from the student's development, the department also focuses on faulty development so that the teachers can adapt Themselves with the technological changes. Hence the Department encourages the staff to participated in training Programs, conference and workshops.

TRAININGS AND COURSES ATTENDED BY OUR STAFF

Ms. P. S. Mali

Mrs. R. V. Karoshi

Industrial training at logibit technology, sangali

Under the guidance of Mr. Nilesh bavdhankar.

Ms . U . P . Kamble .

Industrial training at logibit technology, sangali

Under the guidance of Mr. Yash Chavan

Mr . P . V . Jadhav Completed 8 week NPTEL course on "Surface Engineering of Nanomaterails"

- **Faculty Development Program On Advance in Industrial Automation using PLC and SCADA**
- **Faculty Development Program On Introduction to Industrial Robotics**
- **Faculty Development Program On Digital Manufacturing**
- **Faculty Development Program On Internet of Things**

STUDENT ACTIVITIES

Co-Curricular Activities

TECHNICAL PAPER PRESENTATION

- **Harshwardhan Gavali, Soham Pandharpatte Won First Price in State level Technical paper presentation Ornate 2k24.**

- **Shreya Chougule, Harshada Desai Won Second Price in State level Technical paper presentation Ornate 2k24.**

ROBO RACE

- **Aditya Sutar , Venkatesh Miraje Won First Price in State level Robo Race Event Ornate 2k24**

- **Deepali Raybagkar Won Third Price in State level Robo Race Event Ornate 2k24**

STUDENT ACTIVITIES

Co-Curricular Activities

SPORTS

- Sanket Magdum , Shreyash Magdum ,Aditya Magdum , Nafis Devtale got selected for Zonal Sports Football
- Team Nafis Devtale , Aditya Mishra got selected for Zonal Sports Cricket Team
- Harshwardhan Gavali got selected for Zonal Sports Badminton
- Soham Pandharpatte got selected for Zonal Chess.
- Divya Patil and Team won Zonal Sports at VolleyBall
- Nandini Dange and Team won Zonal Sports at Kho-Kho

ROBOTICS & 3D PRINTING LAB

ACHIVEMENTS IN
STATE LEVEL PROJECT COMPETETION

DIPEX2025

Project Titled "Adaptive Recon Rover For Defence & Wildlife" got Selected for DIPEX2025 under "Defence & Cyber Security" category

THE ADAPTIVE RECON ROVER: DEFENSE AND WILDLIFE IS A MULTIPURPOSE AUTONOMOUS RECONNAISSANCE VEHICLE DESIGNED FOR SURVEILLANCE, THREAT NEUTRALIZATION, AND WILDLIFE PROTECTION. THE ROVER IS EQUIPPED WITH A SLIDING LANDMINE DETECTION MECHANISM, ALLOWING IT TO SCAN AND IDENTIFY EXPLOSIVE THREATS WITH PRECISION. ITS MODULAR GUN CASE CAN BE ADAPTED FOR DIFFERENT OPERATIONAL NEEDS, INCLUDING NON-LETHAL TRANQUILIZERS FOR WILDLIFE CONTROL OR ACTIVE DEFENSE MEASURES. THE INTEGRATED CAMERA SYSTEM, FEATURING OBJECT DETECTION, THERMAL IMAGING, AND GPS, ENHANCES SITUATIONAL AWARENESS BY PROVIDING REALTIME DATA ANALYSIS.

Students Details

1. Preet Anil Jadhav
2. Harshwardhan Dhananjay Gavali
3. Kishansingh Pushparajsingh Hajari
4. Soham Sachin Pandharpatte

Guided by: Mr. P. V. JADHAV

ACHIVEMENTS IN NATIONAL LEVEL
PROJECT COMPETETION

KIT'S PIONEER2025

Project Titled "SMART CRADLE WITH POST NICU"
Awarded for their Outstanding Project & got 3rd Rank in PIONEER2025 Competition at KIT College.


KOLHAPUR INSTITUTE OF TECHNOLOGY'S COLLEGE OF ENGINEERING KOLHAPUR
(AUTONOMOUS)

A National Level Technical Event

PIONEER 2025

"Innovating Today for a Smarter Tomorrow."

Certificate Of Achievement

Students Details

1. Pramod Shashikant Sutar
2. Guru Krushnakant Mane

Guided by: Ms. U. P. KAMBALE

EVENTS UNDER

AROSA

AROSA: Automation & Robotics Students Association

1.CELEBRATION OF TEACHERS DAY

EVENTS UNDER

AROSA

2.TECHNICAL EVENTS ON ENGINEERS DAY

QUIZZY BASH	C CODE STORM

Industrial Visits

Gokul Satellite Dairy plant, Udgaon, Jaisinghpur.

SY

Industrial Visits

Yadravkar Industries Pvt. Ltd. Chipri.	SY

Industrial Visits

GMT (General Machine Tools) Industries Pvt. Ltd.	TY

Industrial Visits

Mane Foundry & Automation Pvt. Ltd. Ichalkaranji. | **SY**

Industrial Visits

Wal-star Technologies PVT. LTD. Kolhapur	SY, TY

Industrial Visits

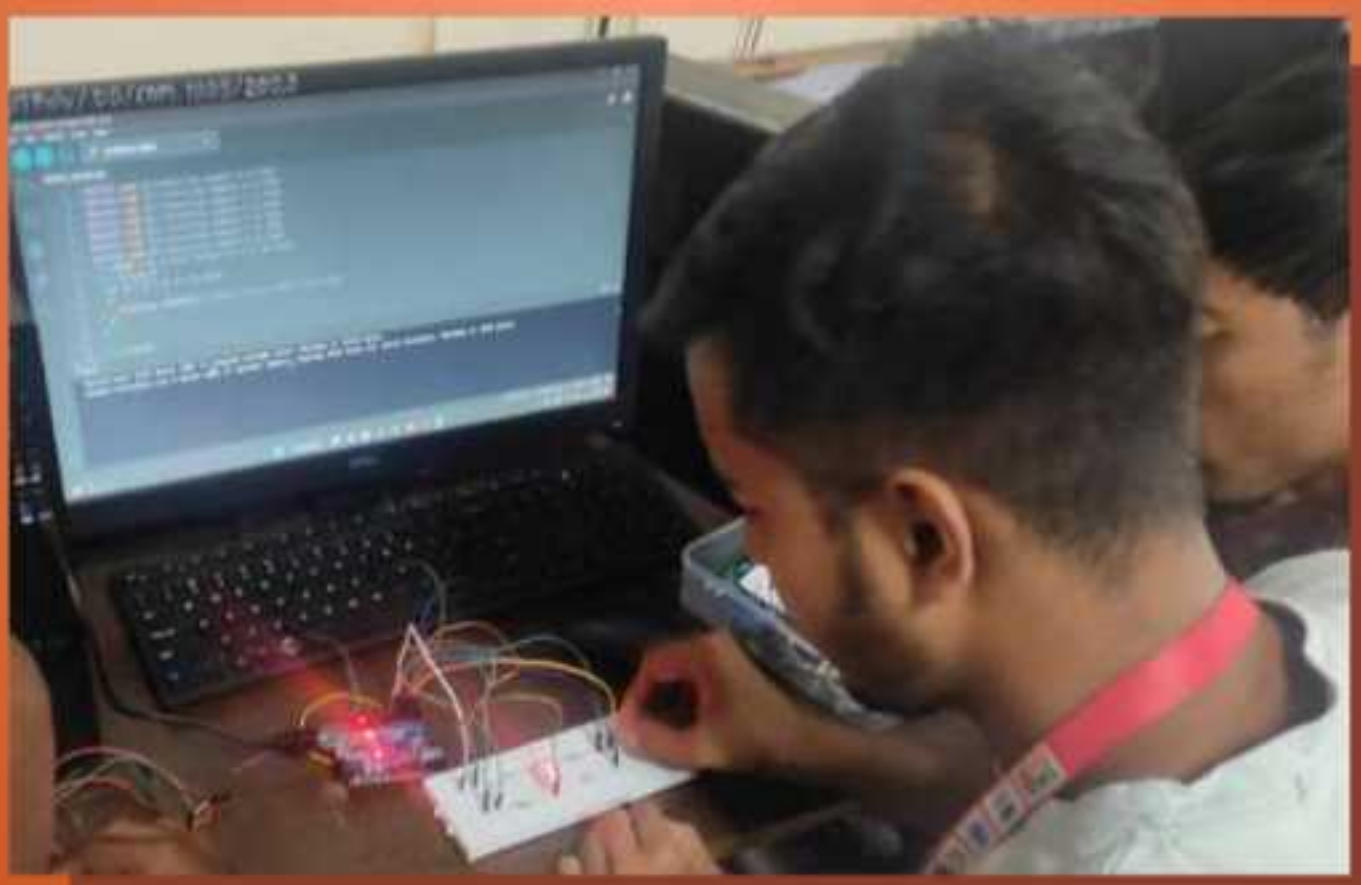
Swabhimani Agro Prodcuts PVT. LTD.	SY

Social Activities

Donation to Orphinage

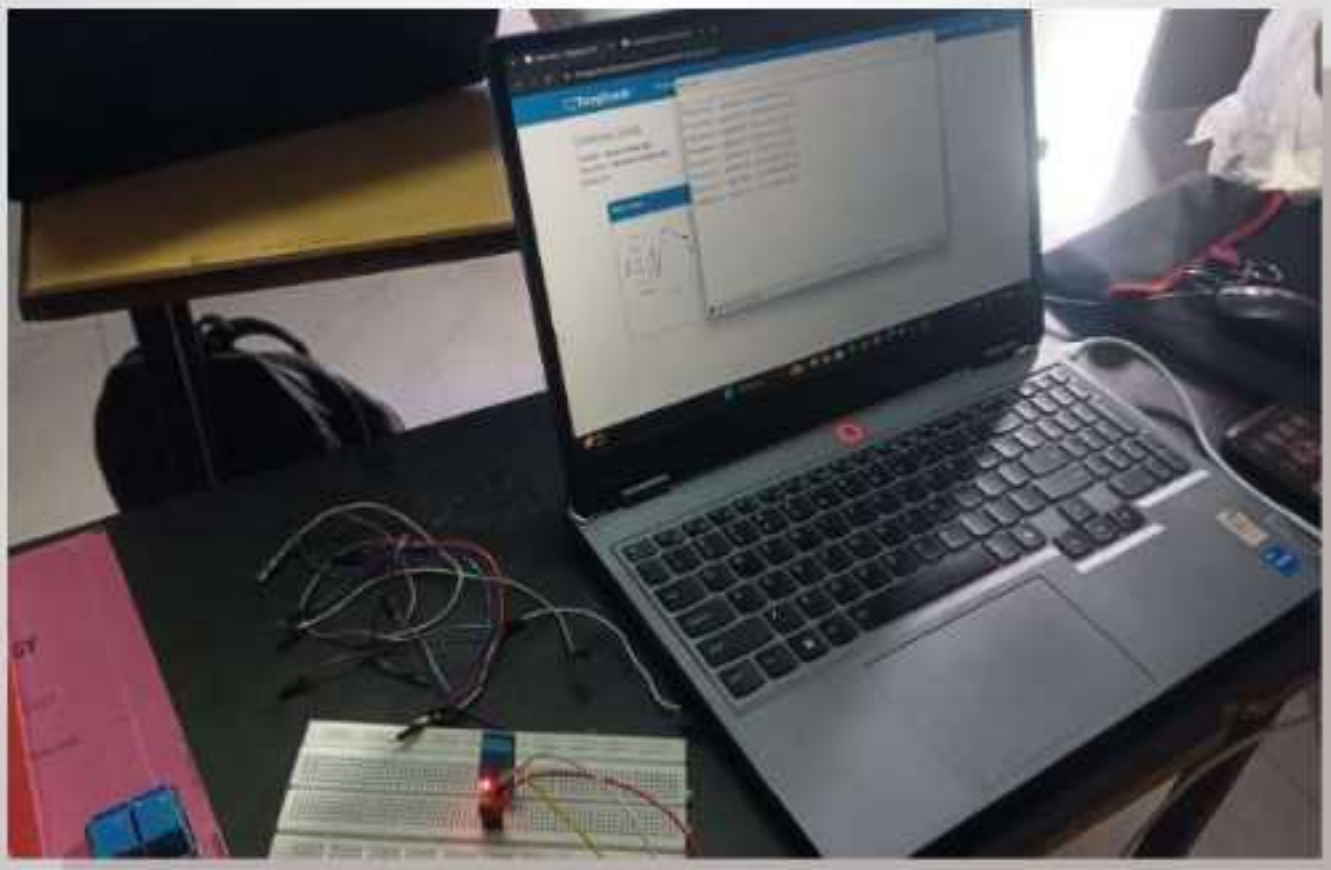
Expert Workshops

Workshop on Arduino based Embedded systems	TY



Expert Workshops

Workshop on IOT	SY



Guest Lectures

Guest Lecture on Persnality Development	SY

Activities under MoU

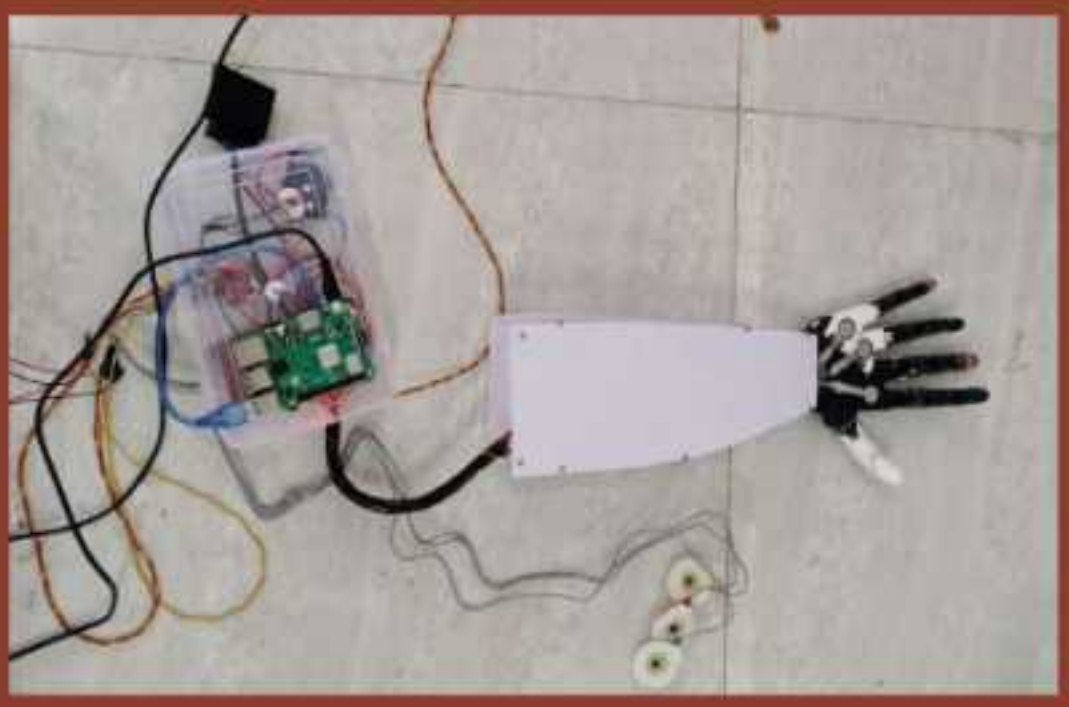
Sr. No.	Company Name	Activities
1.	Kolhapur Jilha Sahakari Doodh UtpadakSangh (Gokul Satellite Dairy plant)	Visit
2.	Yadravkar Industries Pvt. Ltd.	Visit
3.	GMT Industries Pvt. Ltd. (Parvati Industrial Estate)	Visit
4.	Mane Foundry & Automation Pvt. Ltd.	Visit
5.	Walstar Technologies PVT. LTD.	Visit
6.	Personality Development	Guest Lecture
7.	Arduino based Embedded systems	Guest Lecture, Workshop
8.	Laykar Group of Textiles, Ichalkaranji	Visit
9.	Sensors in Robotics	Guest Lecture

Final Year Projects

ADAPTIVE RECON ROVER FOR DEFENCE & WILDLIFE

RC CONTROLLED FERTILIZER SPRAYING ROBOT

PROTECHER: A WEARABLE EMERGENCY RESPONSE SYSTEM WITH SMART BAND AND SOS ENABLED PENDANT



AI DRIVEN SMART PROSTHETIC ARM WITH IOT INTEGRATION FOR ADAPTIVE CONTROL & FEEDBACK"

Technical Articles by Students

AI SEO: The Best Software to Automate Content Creation

KEY TAKEAWAYS

Search engine performance is mainly influenced by the caliber and uniqueness of your content. AI SEO software can greatly improve traffic and content ranking.

Surfer SEO

Surfer SEO is one of the best AI-based SEO tools in the industry. The intelligent content platform has a complete suite of tools covering research, planning, writing, editing and optimization. The platform offers easy-to-use features with low entry-level pricing.

Key Features

Content planning – The content planner will help you gather and consolidate important search terms quickly. These category-based terms act as keywords in an article to improve its ranking and optimization. The planner will help you create the best content strategy.

Content suggestions – Surfer's AI-based tools suggest tips to help you to find the best-ranking topics and keywords.

Generate a content outline – Using this tool, you can create AI optimized content with proper headers and relevant paragraphs. Then, the content can be customized to meet your goals, saving lots of time and effort.

AI-enabled editor – Surfer has an AI-powered text editor. It will help you to analyze the importance of each and every word and give you precise suggestions to improve the content, thus improving search engine ranking and organic traffic.

SEO audit tool – The SEO audit tool is very useful. It gives a detailed audit result of your website. The result will give you information about the page loading speed, keyword density, broken backlinks, meta-tag structure, content length and so on.

Third party integration – Surfer provides support for third-party tool integration. You can easily integrate with the Google Suite, WordPress, Jasper AI and more.

Grow Flow – Grow Flow is a free tool offered by Surfer SEO to help new and small pages grow. It gives you customized suggestions to improve your website search engine ranking, such as improvements for content, links, keywords and more. You have to connect Surfer SEO with a Google search console account.

Frase Surfer SEO is one of the best AI-based SEO tools in the industry. The intelligent content platform has
a complete suite of tools covering research, planning, writing, editing and optimization. The platform offers easy-to-use features with low entry-level pricing.

Preet A. Jadhav AO TY

"Emerging Threats in Cybersecurity: Understanding and Mitigating Advanced Persistent Threats (APTs)"

Abstract: Advanced Persistent Threats (APTs) have become a significant concern in the realm of cybersecurity,
posing serious risks to organizations' sensitive data, infrastructure, and operations. This article provides an in-depth analysis of emerging APT techniques, tactics, and procedures, shedding light on the evolving landscape of cyber threats. It explores the characteristics of APT actors, their motivations, and the sophisticated strategies they employ to infiltrate and persist within targeted networks.

The article examines various stages of the APT lifecycle,
from initial reconnaissance and infiltration to lateral movement and data exfiltration, emphasizing the need for a comprehensive defense strategy that prevention, detection, and response capabilities. It discusses the role of threat intelligence, security analytics, and machine learning in identifying and thwarting APT activities,
highlighting the importance of proactive threat hunting and incident response preparedness.

Furthermore, the article delves into the challenges posed by APTs in the context of cloud computing, remote work environments, and interconnected ecosystems, emphasizing the importance of securing distributed networks and endpoints. It also addresses the regulatory and compliance implications of APT attacks, underscoring the need for organizations to adhere to industry standards and data protection regulations.

In conclusion, the article offers practical recommendations for organizations to enhance their resilience against APTs, including the adoption of defense-in-depth strategies, regular security assessments, employee training programs, and partnerships with cybersecurity experts. By staying vigilant and proactive in the face of evolving cyber threats, organizations can mitigate the risks posed by APTs and safeguard their digital assets and reputation.

Harshwardhan Gavali AO SY

"Blockchain Beyond Cryptocurrency: Transformative Applications and Future Prospects"

Abstract: Advanced Persistent Threats (APTs) have become a significant concern in the realm of cybersecurity,
posing serious risks to organizations' sensitive data, infrastructure, and operations. This article provides an in-depth analysis of emerging APT techniques, tactics, and procedures, shedding light on the evolving landscape of cyber threats. It explores the characteristics of APT actors, their motivations, and the sophisticated strategies they employ to infiltrate and persist within targeted networks.

The article begins by providing a comprehensive overview of blockchain technology, elucidating its decentralized architecture, consensus mechanisms, and immutable ledger functionality. It discusses the fundamental principles that underpin blockchain's trustless and transparent nature, distinguishing it as a groundbreaking solution for mitigating issues related to trust, security, and data integrity in digital transactions.

Moving beyond its origins in finance, the article explores diverse use cases of blockchain technology across sectors such as supply chain management, healthcare, identity verification, and intellectual property rights. It examines how blockchain-based solutions streamline processes, reduce intermediaries, and enhance transparency and accountability, thereby revolutionizing traditional business models and unlocking new opportunities for innovation.

Moreover, the article delves into emerging trends and advancements in blockchain technology, including the rise of decentralized finance (DeFi), non-fungible tokens (NFTs), and interoperable blockchain networks. It discusses the challenges and scalability issues facing blockchain adoption, along with ongoing efforts to address them through protocols like sharding, sidechains, and layer 2 solutions.

Looking ahead, the article outlines future prospects for blockchain technology, envisioning its integration with emerging technologies such as artificial intelligence, Internet of Things (IoT), and quantum computing. It explores the potential impact of blockchain on global trade, digital governance, and sustainable development, emphasizing its role in fostering trust, transparency, and inclusivity in the digital economy of tomorrow.

In conclusion, the article underscores the transformative nature of blockchain technology and its capacity to reshape industries, empower individuals, and drive societal progress. By embracing blockchain innovation and collaborative partnerships, stakeholders can harness its full potential to build a more efficient, secure, and equitable world.

Kishansingh P. Hajari AO TY

"Securing the Internet of Things (IoT): Challenges, Solutions, and Future Directions"

Abstract: The proliferation of Internet of Things (IoT) devices has revolutionized various industries, enabling
unprecedented connectivity and data-driven insights. However, the rapid adoption of IoT technology has also introduced significant cybersecurity challenges, raising concerns about data privacy, device integrity, and network security. This article provides a comprehensive overview of the security issues surrounding IoT deployments and explores strategies to mitigate risks and enhance resilience in IoT ecosystems.

The article begins by examining the unique characteristics of IoT devices, including resource constraints, diverse communication protocols, and heterogeneous architectures, which pose challenges for traditional security measures. It discusses common vulnerabilities exploited by malicious actors, such as weak authentication mechanisms, insecure firmware, and lack of encryption, highlighting the potential consequences of IoT security breaches, including data breaches, service disruptions, and physical harm.

Moreover, the article examines industry best practices and standards for IoT security, such as the Trusted Computing Group's (TCG) Trusted Platform Module (TPM) and the Industrial Internet Consortium's (IIC) Security Framework, emphasizing the importance of collaboration and information sharing among stakeholders to address common security challenges.

Looking ahead, the article outlines future directions in IoT security research and development, including the integration of secure hardware modules, the advancement of lightweight cryptographic algorithms, and the adoption of secure-by-design principles in IoT device manufacturing. It also emphasizes the need for regulatory frameworks and compliance requirements to ensure accountability and transparency in IoT deployments.

In conclusion, the article underscores the critical importance of prioritizing security in IoT deployments to unlock the full potential of connected devices while mitigating the associated risks. By implementing robust security measures, fostering industry collaboration, and embracing emerging technologies, organizations can build resilient and trustworthy IoT ecosystems that deliver value to consumers and enterprises alike.

Gaurav Makote AO TY

Moving towards a Future of Testing in the Metaverse

The Metaverse: With all the hype and chatter around the metaverse, it's becoming increasingly difficult to describe
exactly what the metaverse is and what it looks like. To be clear, the metaverse doesn't actually exist yet and so a good way to describe it is as a hypothetical iteration of the Internet as a single, universal, simulated world, facilitated by a variety of modern computing technologies. In three words, the metaverse will be immersive, interconnected, and endless. Let's explore these three characteristics a bit more.

Test-Driven Metaverse Design:

A research colleague of mine once described the idea of using testing as the headlights of a software project during its early stages. The analogy and illustration he gave was one of a car driving down a dangerous and windy road at night with the only visible lights on the road being those projected from the car's headlights. The moving car is the software project while the edges of the road represent risks, and the headlights are testing-related activities. As the project moves forward, testing sheds light on the project risks and allows engineering teams to make informed decisions through risk identification, quantification, estimation and ultimately mitigation. Similarly, as we start to design and develop the metaverse, teams can leverage test-driven design techniques for risk mitigation. These may include:

Metaverse Testing

Achieving acceptable levels of coverage when testing the metaverse will likely require a high degree of automation. In comparison with traditional desktop, web, or mobile applications, the state space of a 3D, open world, extended reality, and online experience is truly vast and exponentially large. In the metaverse, at any moment you will be able to navigate your avatar to a given experience, equip various items and customizations, and interact with other human or computer-controlled characters. The content itself will be constantly evolving, making it a continuously moving target from an engineering perspective. Without sufficient test automation capabilities, creating, executing, and maintaining tests for the metaverse would be extremely expensive, tedious, and repetitive activities.

A Future of Testing in the Metaverse

I firmly believe that in addition to the technical and engineering challenges that come along with creating something as complex as the metaverse, its development will bring with it several opportunities for testers to play a vital role in the future of the Internet. As software experiences become more "human", skills like user empathy, critical thinking, risk analysis, and creativity become even more necessary and will be emphasized.

Shreyash Patil AO TY

MSBTE Toppers

WINTTER 2023

SY

Venkatesh A. Miraje
85.88%

Rutuja K.Dongare.
85.35%

Sumit S. Patil
84.13%

TY

Soham S.
Pandharpatte.
92.35%

Tanishka D.
Shirole.
90.47%

Harshwardhan D.
Gavali.
90.35%

Shreya V.
Chougule
90.00%

To the readers...

This news letter is published once in a year highlighting major events of the "Department of Automation & Robotics". In case of any suggestions or feedback feel free to share with us.
Kindly see the office of HOD "Automation & Robotics" and share your feedback directly.

Mr . A . K. Magdum.
Head of Department
Automation and Robotics

Credits

- **Editor in chief:** Mr. A. K. Magdum. (HOD)
- **Deputy Editor:** Ms. U. P. Kamble. (Lecturer)
- **Member:** Mr. P. V. Jadhav. (Lecturer)
- **Member:** Ms. P. S. Mali. (Lecturer)
- **Member:** Preet A. Jadhav. (TY) **Student**
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