The Communique

Presidency School of Computer Science & Engineering
&
Presidency School of Information Science

Digital Twin: The Power of Real Time Replication

Vision of Presidency School of Computer Science and Engineering

Vision	To be a value-driven global University, excelling beyond peers, creating professionals of integrity and character, and having concern and care for society.

Mission of Presidency School of Computer Science and Engineering

Mission	Commit to be an innovative and inclusive institution by seeking excellence in teaching, research, and knowledge.
Mission	Pursue research and development and its dissemination to the community at large.
Mission	Create, sustain, and apply learning in an interdisciplinary environment with consideration for ethical, ecological, and economic aspects of nation-building.
Mission	Provide knowledge-based technological support and services to the industry in its growth and development.
Mission	To impart globally applicable skill sets to students through flexible course offerings, support industry's requirements, and inculcate a spirit of new venture.

PROGRAM SPECIFIC OUTCOMES (PSOs) FOR B.TECH

PSO1	Problem Analysis: Identify, formulate, research literature, and analyse complex engineering problems related to Software Engineering principles and practices, Programming and Computing technologies reaching substantiated conclusions using first principle of Mathematics, Natural Sciences and Engineering Sciences.
PSO2	Design/development of Solutions: Design solutions for complex engineering problems related to Software Engineering principles and practices, Programming and Computing technologies and design system components or processes that meet the specified needs with appropriate consideration for the public health and safety, and the cultural, societal and environmental considerations.
PSO3	Modern Tool usage: Create, select, and apply appropriate techniques, resources, and modern engineering and IT tools including prediction and modelling to complex engineering activities related to Software Engineering principles and practices, programming and computing technologies with the understanding of the limitations.

Vision of Presidency School of Information Science

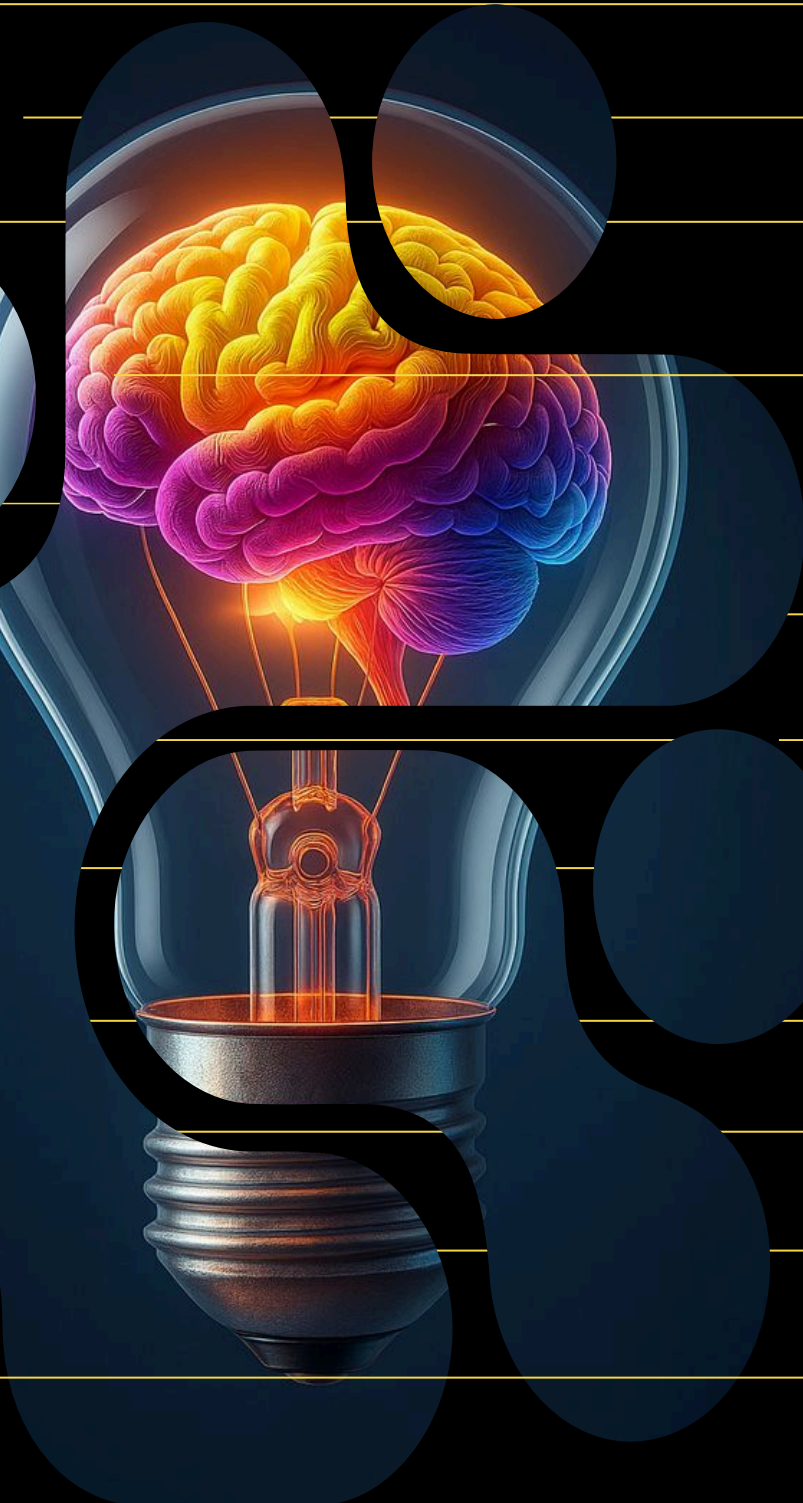| Vision	To be a global centre of excellence in information science and research, fostering innovation and producing professionals with integrity and ethical responsibility.

Mission of Presidency School of Information Science

Mission	To provide high-quality education in information science, equipping students with strong technical expertise and problem-solving skills.
Mission	To promote research and innovation in information science and technology, addressing real-world challenges through industry collaboration.
Mission	To nurture graduates with strong ethical values and a commitment for lifelong learning for sustained professional growth in the IT sector and allied fields.

PROGRAM SPECIFIC OUTCOMES (PSOs) FOR BCA

PSO1	Disciplinary knowledge: Demonstrate comprehensive knowledge and understanding of Computer Applications, Data Science and AI/ML techniques.
PSO2	Problem Solving: Identify, formulate and apply appropriate techniques in the areas related to Software development, Big data, Network, Cloud computing technolgies and related domains of varying complexities in real-time applications.
PSO3	Design/development of Applications: Design, develop, and test full stack applications by applying principles of software engineering, addressing real-world requirements across various domains.

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LETTER FROM THE EDITOR

From Insights to Impact—Lead the Change

As we enter an era of intelligent innovation, Digital Twin technology is quietly transforming our world—replicating physical assets, systems, and processes into dynamic digital counterparts.

From smart cities and healthcare to aerospace and manufacturing, Digital Twins are reshaping how we design, operate, and make decisions. This edition, "Digital Twin: The Power of Replication," highlights their potential to create smarter, more efficient, and sustainable solutions.

We explore real-world applications, cutting-edge research, and the need for ethical considerations, particularly in data security, trust, and governance.

Digital Twins offer predictive insights, safer experimentation, and optimized performance, addressing both current challenges and future needs. The focus is not just what can be replicated, but how this technology can be used responsibly.

Technology must empower humanity, not overshadow it. By understanding the opportunities and responsibilities Digital Twins bring, we can shape systems, industries, and societies that are smarter, safer, and more resilient.

Join us in exploring how replication today can shape smarter, sustainable, and more resilient tomorrows.

The Editorial Board

FROM THE HELM

It is my privilege to present this edition of The Communique, centered on a theme that captures one of the most transformative innovations of our time: "Digital Twins: Bridging the Physical and Virtual Worlds."

Digital twin technology is redefining how we design, monitor, and optimize the systems around us. By creating dynamic virtual replicas of physical assets and processes, it enables real-time analysis, predictive insights, and smarter decision-making. From reducing downtime in aircraft engines and streamlining industrial production lines to advancing personalized healthcare and sustainable urban planning, digital twins are transforming possibilities into practical realities.

Yet, this power comes with responsibility. Questions of scalability, interoperability, data security, and ethical governance must remain at the forefront to ensure that digital twins serve as tools for progress and not sources of new vulnerabilities. True impact lies in integration—where technology and human ingenuity converge to drive sustainable innovation.

At Presidency University, we are committed to preparing our students to lead in this evolving landscape. Through interdisciplinary research, hands-on learning, and a strong culture of innovation, we strive to nurture professionals who not only understand the "how" of digital twin technology but also the "why" behind its application.

This edition offers insights into both the opportunities and challenges of digital twins as they stand at the intersection of technological advancement and societal impact. I invite you to explore its perspectives, reflect on its ideas, and envision a future shaped by responsible innovation.

Best Regards,
Prof. (Dr.) S. Sivaperumal
B.E. (ECE), M.E. (VLSI), Ph.D. (Control Systems), Ph.D. (Communication Systems), FIE., FIETE., SMIEEE., MISTE.
Pro-Vice Chancellor
Director – International Relations
Professor – Electronics and Communication Engineering

FROM THE HELM

It is with great pleasure that I present this edition of The Communique, focused on one of the most impactful frontiers of technology today: "Digital Twins: Engineering the Future Through Intelligent Replication."

Digital twins represent the convergence of data, computing, and connectivity—an intelligent bridge between the physical and digital worlds. By creating dynamic virtual counterparts of real systems, they allow us to analyze performance, predict behavior, and optimize outcomes with unprecedented precision. From monitoring industrial operations and advancing healthcare diagnostics to designing resilient cities and sustainable environments, digital twins are shaping solutions that were once only imagined.

For the domains of Computer Science and Information Science, this is a transformative opportunity. The power of digital twins is driven not only by sensors and networks but also by robust data architectures, scalable algorithms, cloud platforms, and artificial intelligence. Our disciplines stand at the core of this ecosystem—ensuring that digital replicas are accurate, secure, and capable of generating actionable intelligence.

At the same time, this technological revolution demands responsibility. Challenges such as interoperability, cybersecurity, ethical use of data, and environmental impact must be addressed with equal vigor. True progress lies in ensuring that innovation is aligned with human values and societal well-being.

At Presidency University, the School of CSE and IS is committed to preparing students to lead this future. Through interdisciplinary research, industry collaboration, and experiential learning, we nurture professionals who combine technical mastery with ethical foresight—capable of designing systems that are not only intelligent but also responsible.

This edition of The Communique offers diverse perspectives on the promise and challenges of digital twins. I invite you to explore its ideas, reflect on its implications, and contribute to shaping a digital future that is innovative, sustainable, and inclusive.

Best Regards,
Prof. (Dr.) N. Duraipandian
M.E.,Ph.D.,
Dean Presidency School of Computer Science and Engineering & Information Science

THE COMMUNIQUE

THE TEAM

The essence
and
The spirit
That breathe
Life into it all.

DR. R. MAHALAKSHMI
EDITOR -IN-CHIEF

MS. NEHA ARORA
EDITOR

MS. DEVI S
EDITOR

Welcoming Our New Torchbearers of Knowledge

Welcome Aboard: Our New Faculty Members,

We are delighted to welcome our newest faculty members to the Presidency family. With their expertise, passion, and dedication, they bring fresh perspectives that will strengthen our academic community and inspire our students to reach greater heights.

At Presidency University, we believe that the true strength of an institution lies in its people. Each new member adds not only knowledge and experience but also the energy, ideas, and enthusiasm that fuel innovation and progress. As they step into our classrooms, laboratories, and research spaces, we are confident they will spark curiosity, encourage collaboration, and nurture a spirit of discovery.

We look forward to the diverse contributions they will make—whether through pioneering research, guiding students on their academic journey, or introducing innovative teaching practices that shape the future. Together, we will continue to uphold our shared vision of excellence, integrity, and societal impact.

To all our new colleagues—welcome aboard! May this new chapter be filled with rewarding experiences, meaningful connections, and collective success.

Embracing Excellence, Together at Presidency!

Warm Regards,
The Editorial Board

Digital Twin: Transforming Education in India

Across the world, and increasingly in India, digital twin technology is stepping into classrooms, campuses, and labs. A digital twin is a virtual copy of a physical system, and when applied to education, it creates powerful opportunities for immersive learning, smarter campus management, and equal access to resources.

One striking example is Delhi's government schools, where the PM eVIDYA initiative has introduced more than 300 virtual labs through the Diksha portal. These labs allow students to conduct experiments in science and mathematics from any device, even in schools that lack physical lab infrastructure. For many children, this is the first time they can experience hands-on learning.

Medical education is also seeing a revolution. The Maharashtra University of Health Sciences (MUHS) has launched CHAKRA, a digital simulation hub that lets future doctors practice clinical procedures in a safe, controlled virtual environment. This ensures that students can make mistakes, learn, and repeat until they master the skills—without any risk to real patients.

> **Education is no longer confined to walls-it now has a living, digital mirror.**

Higher education institutions are adopting the technology too. At IIT Kanpur's Virtual Labs Conference, researchers showcased how digital experiments can now be conducted in Hindi and other Indian languages. This simple but vital step makes advanced learning tools available to students far beyond metro cities, creating a more inclusive academic ecosystem.

Top Digital Twin Projects in Indian Education

- PM eVIDYA Virtual Labs (Delhi) – Bringing over 300 interactive science and math labs to government schools.
- MUHS "CHAKRA" (Maharashtra) – A simulation hub for training medical students with virtual patients.
- IIT Kanpur Virtual Labs – Expanding remote STEM experiments into Indian languages for wider access.

Digital twins are not just making learning more interactive—they are making it fairer. Whether it's a school in a rural district or a premier medical college, students are getting access to the same level of practical, future-ready education.

> *The classroom of tomorrow won't just teach reality—it will let students practice with its digital twin.*

Sources: Times of India (Delhi Virtual Labs, MUHS CHAKRA, IIT Kanpur Virtual Labs, 2024–2025) · Journal of Informatics Education and Research (2025)

Warm Regards,
**The Editorial Board**

Building Tomorrow: Careers in Digital Twin

A digital twin is a virtual copy of a real system—anything from a jet engine to an entire city. By combining data, sensors, and simulations, it allows industries to test ideas, predict issues, and improve performance without touching the real thing.
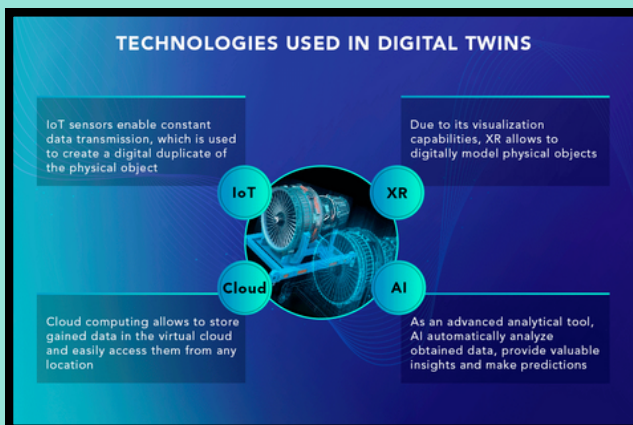
In India, this technology is gaining strong momentum. A report by nasscom and dassault systèmes shows that adoption of virtual twins has more than doubled since the pandemic. Leading companies such as TCS, Infosys, Tech Mahindra, LLTS, siemens, and ge digital are actively using it to support clients across manufacturing, energy, and healthcare.

The three elements of a digital twin

1. Real-world entity or process
2. Virtual representation
3. Data that connects the two

Startups including Intangles, Switchon, Pratiti technologies, and Aiotel are also innovating in areas like automotive maintenance, solar power, and factory automation. Even in medicine, the change is visible—sgpgi hospital in Lucknow has begun creating digital twins of patients to help doctors plan safer surgical procedures
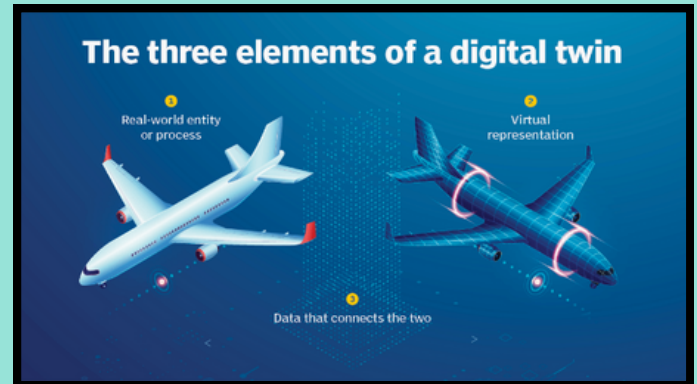
> **"IN THE WORLD OF DIGITAL TWINS, THE VIRTUAL YOU MAY BE THE KEY TO IMPROVING THE REAL YOU."**

To prepare, students should focus on programming skills such as Python or C++, cloud platforms like AWS or Azure, and simulation tools such as ANSYS and Simulink. Knowledge of IoT and cybersecurity basics will also give an edge.
Digital twin technology sits at the intersection of engineering, computing, and creativity. With India pushing ahead in smart infrastructure, healthcare, and manufacturing, it promises not just jobs but also the chance to shape the future.

TECHNOLOGIES USED IN DIGITAL TWINS

IoT sensors enable constant data transmission, which is used to create a digital duplicate of the physical object

Due to its visualization capabilities, XR allows to digitally model physical objects

Cloud computing allows to store gained data in the virtual cloud and easily access them from any location

As an advanced analytical tool, AI automatically analyze obtained data, provide valuable insights and make predictions

IoT · XR · Cloud · AI

For students, this opens up exciting opportunities. Job postings on LinkedIn, Naukri, and Indeed show rising demand for professionals in this space. Some of the most sought-after roles include:

- ✓ **Digital Twin Engineer**
- ✓ **Data Scientist**
- ✓ **IoT Specialist**
- ✓ **Simulation Engineer**
- ✓ **Cybersecurity Specialist**

Dr. Gopal Krishna Shyam
Professor & HOD, PSCS
Presidency University Bengaluru

THE RISE OF DIGITAL TWINS IN HEALTHCARE

Imagine a world where your doctor can test a treatment on you before it ever reaches your body. Not a guess, not a general assumption, but a real-time experiment carried out on your own virtual self. Thanks to digital twin technology, this is becoming a reality in hospitals and research labs around the world.

A digital twin is essentially a living digital copy of a patient, an organ, or even an entire hospital system. Unlike traditional models that remain static, a digital twin evolves as it is fed with real-time data from scans, wearables, and health records. It acts like a health mirror that not only reflects but predicts, adapts, and guides. For doctors, this means anticipating complications, testing drug responses, or rehearsing surgeries without risk. For patients, it promises safer care and treatments tailored to their bodies.

One breakthrough comes from Europe, where researchers and Siemens Healthineers are developing digital twin hearts for patients with cardiovascular disease. The process begins with MRI scans and ECG data, combined with wearable sensors, to build a detailed virtual heart. This model does not sit idle—it beats, pumps, and responds like the real one. Physicians can test medications, adjust pacemaker settings, or simulate surgeries first, seeing how the patient's body is likely to react.

For one patient with heart failure, the digital twin became a lifesaver. Doctors tested multiple treatments on his virtual heart, narrowing down to the one that worked best. The result was a dramatic improvement in quality of life, fewer hospital visits, and greater confidence in the medical team.

Challenges remain: protecting medical data, high costs, and slow regulations. Yet many experts believe that within a decade, individuals could have personal digital twins, making medicine less reactive and more preventive. The digital twin heart is only the beginning, pointing toward a future where real and virtual selves work together for longer, healthier lives.

Dr. Vetrimani Elangovan,
Head of the Department (PSIS-UG)
Presidency University, Bengaluru

IORT – THE INTERNET OF ROBOTIC THINGS: THE NEXT EVOLUTION IN SMART AUTOMATION

The Internet of Robotic Things (IoRT) merges the Internet of Things (IoT) with Robotics, transforming how machines interact with their environment, each other, and humans. IoRT networks smart robots that collect data, analyze it, make decisions, and act independently or collaboratively, powered by sensors, AI, and communication technologies.

Key Highlights

- Perception and Sensing: Robots gather real-time data via LiDAR, cameras, and environmental sensors.
- Edge & Cloud Computing: Decisions are made locally or via cloud analytics for advanced learning.
- Autonomous Coordination: Robots coordinate actions, e.g., rerouting warehouse bots or adjusting drone deliveries.
- AI Integration: Machine learning and computer vision help robots adapt and improve over time.

Applications Across Industries

- Smart Manufacturing: Inventory management, predictive maintenance, and collaborative assembly.
- Healthcare: Surgical robots, patient monitoring, and autonomous disinfection.
- Agriculture: Drones and ground robots optimize irrigation, monitor crops, and detect pests.
- Smart Cities: Automated traffic control and security surveillance.

The Road Ahead

The future of IoRT relies on 5G, edge AI, blockchain security, and advanced human-robot interaction. As robots become increasingly context-aware, IoRT will foster collaborative ecosystems where machines not only automate tasks but also learn and evolve through shared experiences.

Mr. Santhosh Kumar K L
Assistant Professor. PSCS,
Presidency University , Bengaluru

THE VIRTUAL YOU: HOW MEDICINE IS GETTING PERSONAL

Imagine a world where doctors don't just treat symptoms—they anticipate them. Where surgeries are simulated before they're performed. And where every patient has a virtual version of themselves guiding treatment. Welcome to the world of digital twins in healthcare—an innovation reshaping the future of medicine.

A digital twin is a real-time, virtual representation of a patient or specific organ, created using data from wearables, electronic health records, imaging, and more. Continuously updated, it can simulate how a patient's body will respond to medications, procedures, and lifestyle changes before they occur in reality.

One powerful application is personalized treatment planning. For chronic conditions like heart disease or diabetes, digital twins help predict complications, optimize dosages, and recommend lifestyle changes tailored to each patient. In cancer care, they allow oncologists to forecast tumor responses to chemotherapy, reducing trial-and-error and improving outcomes.

Surgeons also use digital twins to plan and rehearse complex operations. Patient-specific anatomical data enables virtual simulations that minimize risks and improve precision, turning uncertainty into confidence.

Artificial intelligence (AI) further enhances digital twins. Machine learning enables predictions of future health risks, such as early detection of sepsis or cardiac arrest, often before vital signs change, giving clinicians a critical head start.

Challenges remain, including data privacy, interoperability, and regulatory approval. Yet as technology and ethical frameworks advance, digital twins are poised to become integral to modern healthcare—bridging the gap between data and truly personalized medicine.

Dr. Hasan Hussain Shahul Hameed
Professor, PSIS
Presidency University, Bengaluru
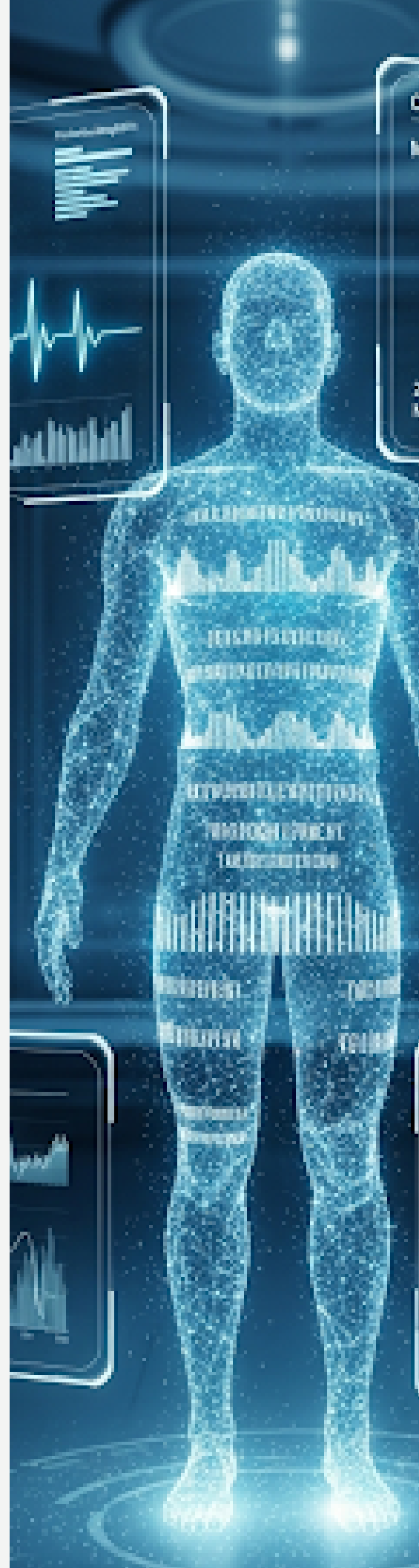
ETHICS IN DIGITAL TWINS WITH ARTIFICIAL INTELLIGENCE AND MACHINE LEARNING

As Digital Twins evolve through AI and Machine Learning, they hold immense potential — from predictive healthcare to smart cities. But replicating physical entities digitally also raises ethical concerns around privacy, fairness, security, and accountability.

- **Data Privacy and Consent:** Real-time data, often sensitive, fuels Digital Twins. Without explicit consent and strong governance, individuals risk digital surveillance. Ethical use requires privacy safeguards, anonymization, and transparency.
- **Bias and Fairness:** AI learns from historical data that may carry biases. If unchecked, Digital Twins can reinforce inequalities. Inclusive and balanced training data is essential for fair outcomes.
- **Security and Integrity:** Twins tied to critical infrastructure are cyber attack targets. A compromised twin could mislead decisions or cause harm. Strong cybersecurity and clear accountability are vital.
- **Human Oversight:** With growing autonomy, human judgment must remain central. Technology should support, not replace, experts.
- **Transparency:** AI-powered twins must be explainable. Stakeholders should understand decision processes, with audit trails ensuring accountability.

Conclusion

Digital Twins can transform society, but only if built on ethics. Responsible innovation demands collaboration among developers, researchers, and policymakers to ensure systems remain secure, fair, transparent, and human-centered.

Dr. S. Saravana Kumar
Associate Professor, PSIS
Presidency University, Bengaluru

FROM PHYSICAL TO VIRTUAL: THE RISE OF DIGITAL TWINS

A digital twin is a living, data-driven replica that learns, predicts, and guides decisions in real time."

Digital twins are virtual counterparts of physical assets—machines, buildings, cities, or patients—that continuously update with real-time data. They simulate outcomes, guide decisions, and help prevent risks, transforming industries from manufacturing to healthcare.
Applications:

- Manufacturing: Optimize production lines, predict failures, reduce downtime.
- Product Development: Test designs virtually, cut R&D costs.
- Smart Cities: Enhance traffic, energy use, and safety.
- Healthcare: "Digital patients" personalize treatment and forecast disease.

Building a Digital Twin

- Start with a high-impact pilot, deploy sensors, establish secure data flows, and combine AI with simulations. Track lifecycle data and use analytics for monitoring, predictions, and control. Scale modularly for broader adoption.

Challenges

- Data quality and sensor accuracy.
- Interoperability and vendor lock-in.
- Cybersecurity and secure access.
- Collaboration across IT, OT, and engineering.

Future Directions

AI-powered, self-learning twins; human-centric applications; composable twin marketplaces; cybersecurity simulations.

Conclusion

Digital twins turn data into actionable insight. Organizations that start small, govern effectively, and scale smartly can unlock efficiency, reduce costs, and improve decision-making.
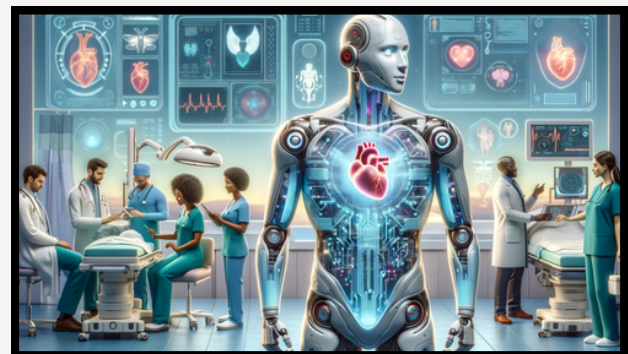
Dr. Pradeep Bhaskar
Assistant Professor - Selection Grade
Presidency School of Engineering
Presidency University, Bengaluru

INDIA'S DIGITAL TWIN ECOSYSTEM IS POWERING SMART INNOVATION IN 2025

India is fast emerging as a leader in Digital Twin technology. From automotive labs to airports and shipyards, industries are using real-time simulations, AI, and predictive analytics to build smarter and more efficient systems.

- **Mercedes-Benz R&D India** in Bengaluru, the company's largest centre outside Germany, is advancing mobility-focused digital twins, supported by partners like SAP and Infosys. Inspired by its work, CIO Katrin Lehmann visited with her German team in early 2025.
- **Hyderabad International Airport** now operates a Digital Twin-enabled Predictive Operations Centre, integrating 40+ systems to improve passenger flow, logistics, and infrastructure.
- **Goa Shipyard Ltd,** with IIT Hyderabad, is using Digital Twins for ship design and operations—cutting development cycles, improving maintenance, and enhancing performance modelling.
- **Under PM Gati Shakti,** AI-powered digital twins are transforming India's infrastructure—optimizing roads, railways, ports, and transport systems with predictive analytics to cut inefficiencies and emissions.
- **Genesys International has integrated DIGIPIN,** India Post's digital address code, into its 2D/3D maps, boosting accuracy for urban planning, logistics, and emergency response.

These initiatives highlight India's growing digital future, supported by GCCs, tech hubs like Bengaluru, Industry 4.0 adoption, and strong government backing. From labs to ports, India is truly building its future—one twin at a time.

Ms. Sterlin Minish T N,
Assistant Professor – PSCS,
Presidency University , Bengaluru

REVOLUTIONIZING SMART CITIES, PREDICTIVE MAINTENANCE, AND PERSONALIZED HEALTHCARE

Digital Twins—the real-time digital replicas of physical systems—are transforming the way we design, monitor, and optimize the world around us. From smart cities and industry 4.0 to personalized healthcare, they enable real-time data synchronization, cyber-physical convergence, and high-fidelity simulations. By not only mirroring reality but enhancing it, Digital Twins are paving the way for smarter, faster, and more sustainable futures.

🏙 Smart Cities

Use Case: Urban Traffic Optimization

A city-scale twin integrates IoT sensors, satellite feeds, and traffic signals to optimize mobility.

- 🚗 30% reduction in congestion.
- 💡 25% energy savings (lighting & HVAC).
- 🚨 40% faster emergency response.

⚙ Predictive Maintenance

Use Case: Manufacturing Plant Twin

Machinery twins predict failures and optimize operations.

- 🔧 45% fewer unplanned downtimes.
- 📉 60% cut in maintenance costs.
- 🧠 90% anomaly detection accuracy.

Smart city digital twin architecture

🧬 Personalized Healthcare

Use Case: Patient-Specific Avatars

Human physiology twins help doctors design precise treatments.

- ❤ 20% faster cardiac diagnosis.
- 🧪 3× better drug response prediction.
- 🧬 95% model fidelity in simulating organ reactions.

🌐 Challenges

- Latency: Solved with edge computing.
- Data Quality: AI-driven fusion of diverse streams.
- Model Drift: Continuous calibration with real-world feedback.

Conclusion

- Digital Twins are no longer futuristic—they are living digital companions to our physical world. By amplifying urban life, revolutionizing industries, and transforming healthcare, they redefine how we design, predict, and perfect the future
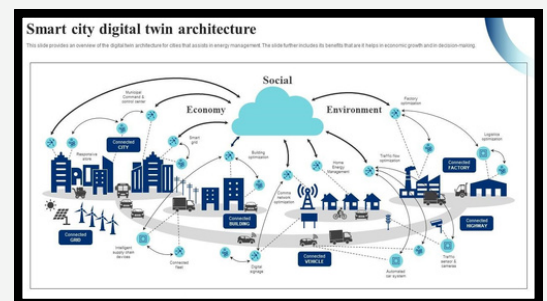
Dr. Harish Kumar
Assistant Professor - Senior Scale, PSIS
Presidency University, Bengaluru

Research Frontiers

Praveen Pawaskar, H.K. Yogish, B. Pakruddin, and Y. Deepa, has published reserach paper titled 'A Novel and Efficient Deep Learning Models for Assessing AI's Impact on Disease Diagnosis in Agriculture' in the Indian Journal of Agricultural Research

Mr. Pakruddin B.
Assistant Professor

Mr. Praveen Pawaskar
Assistant Professor

Dr. Prema Arokia Mary G is recognized for her design patent on an AI Enabled Device for Detection of Neurological Disorders, showcasing innovation in healthcare technology.

Dr. Prema Arokia Mary G
Associate Professor

Ms. Poornima S received the Best Innovation Ambassador Award at the In-house Innovation Ambassador Conclave, celebrating her dedication to fostering innovation and entrepreneurship.

Dr. Poornima Selvara
Assistant Professor- Senior Scale

Dr. Amirtha Preeya V, Assistant Professor, Presidency University, has been awarded a Ph.D. in Computer Science and Engineering for her pioneering research on Mango Leaf Disease Identification and Classification using Machine Learning Techniques.

Dr. Amirtha Preeya V
Assistent Professor

Research Frontiers

B. Pakruddin published his research article on "Performance Evaluation of Deep Learning Models for Multiclass Disease Detection in Pomegranate Fruits" in the Indian Journal of Agricultural Research.

Mr. Pakruddin B.
Assistant Professor

Dr. Kimmi Kumari, along with Ms. Riya Sanjesh, has published the book Decoding Challenges: Java in Action under Clever Fox Publishing, marking a proud academic achievement.

Dr. Kimmi Kumari
Assistant Professor - Senior Scale

Ms. Riya Sanjesh
Assistant Professor

Ms. Neha Arora
Assistant Professor

Dr. Debasmita Mishra,
Assistant Professor

Ms.Priyanka Niranjan
Assistant Professor

Ms. Radhika Sreedharan
Assistant Professor

Prof. Neha Arora, Dr. Debasmita Mishra, Prof. Priyanka Niranjan Savadekar, and Prof. Radhika Sreedharan have authored the book Hands-on Deep Learning with Python: A Beginner's Guide (ISBN: 9789367099294), published by Clever Fox Publishing.

Ms. Shreya D
Student

Ms. Hemashree YU
Student

Ms. Priyanka K
Student

Ms. Kavana KN
Student

Mr. Pakruddin B.
Assistant Professor

Ms. Shreya D, Ms. Kavana K N, Mr. Pakruddin B, Ms. Hemashree Y U, and Ms. Priyanka K presented their research paper on Brain Stroke Classification Based on Deep Learning: Enhanced Neural Architectures for Quick and Precise Diagnosis at the 2nd International Conference on New Frontiers in Communication, Automation, Management and Security (ICCAMS) held at Presidency University.

Canvas Chronicles

Dr. Debasmita Mishra
Assistant Professor

Ms. Swetha Rajagopal
Assistant Professor

Ms. Priyanka Niranjan
Assitant Professor

INDUSTRY PULSE

DR. PADMAPRIYA P →

INSIDE THE MIND OF A VISIONARY PHYSICIAN AND ACADEMICIAN

Dr. Padmapriya is a distinguished physician, academician, and researcher passionate about integrating medical sciences with technology to drive ethical healthcare innovations.

M.B.B.S.,MD(PMR)., FIPM, IOC – DSM, PGD CS & AI

Q How would you define a digital twin in the context of modern software system?

Q How does it differ from traditional simulation model?

Q Which software frameworks or platforms are most effective for building digital twins, and why?

A digital twin is a virtual representation of a complex system or component that mirrors its real-world counterpart in real time. It continuously receives data from the live system, enabling simulation, analysis, and optimization throughout. They reflect the current state of the system using live telemetry and logs. We can test scenarios, predict potential issues, and optimize performance without affecting the actual system. It is helpful in troubleshooting problems in distributed systems without direct access. It is a safe virtual environment to run simulation testing of complex and complicated systems either as a whole or a part component.

While both digital twins and traditional simulation models replicate real-world systems, traditional simulation is like a snapshot, whereas digital twins are more like a live video feed. Traditional simulations are one-time analyses of static, predefined parameters with limited interaction. In contrast, digital twins use real-time, dynamic data, continuously updated through a feedback loop. With high potential for AI integration, predictive decision-making, and scalability, digital twins provide a more powerful and responsive approach than traditional simulations. In the healthcare sector, they offer strong possibilities for system design and digital transformation.

Basically, I'm a Physiatrist with dual role of a Clinician, involved in direct patients care and a Faculty in Medical Education & Research, teaching Medical students. So, I am not a technological expert to answer this in detail. I have tried quite a few including some open source platforms for exploration and learning. I used to take help from and collaborate with professionals as and when its needed. My experience in building digital twin is limited to exploration in health care sector. Passion to learn and explore drives me further.

INSIDE THE MIND OF A VISIONARY PHYSICIAN AND ACADEMICIAN

Q Can you share a real-world digital twin project and its measurable impact?

Digital twin technology is making waves in healthcare with potential to improve patient outcomes, reduce costs, and accelerate innovation. My current focus is on resource management system, Device development, Locomotion-Biomechanics, Rehabilitation outcome Prediction Models. And also exploring the possibilities of Evidence based and Data Driven Personalised Models paving path to Personalised Medicine. I view digital twins are not just futuristic concept, Digital Twins in responsible hands can actively reshape healthcare delivery and innovation.

Q What are the key security considerations for digital twins in sensitive industries like healthcare and manufacturing?

Implementing digital twins in sensitive industries demands rigorous security to protect data, ensure system integrity, and maintain trust. These environments deal with high-value assets and personal information, making them prime cyber targets.

1. Data Privacy: Encrypt PHI and comply with HIPAA/GDPR.
2. Access Control: Use RBAC and MFA.
3. Secure Transmission: Apply TLS/HTTPS for real-time data.
4. Integrity: Use hashing/blockchain to detect tampering.
5. Resilience: Deploy IDS and anomaly detection.
6. Compliance: Ensure consent, ownership, and meet industry standards.
7. Auditability: Maintain logs for analysis and audits.

Q How will AI, IoT, and edge computing shape digital twins in the next five years?

With responsible AI, IoT, and edge computing, digital twins will become smarter, faster, and more autonomous. AI and Generative AI will enable real-time analytics and self-learning, shifting twins from reactive to predictive. IoT will provide seamless integration and real-time data from billions of devices, enabling hyper-personalized healthcare and precision manufacturing. Edge computing will ensure speed, safety, and scalability by bringing intelligence closer to assets. Together, they will unlock new business models, competitive advantages, and transformative use cases in healthcare.

DEPT NEWS

2nd IEEE International Conference on New Frontiers in Communication, Automation, Management and Security (ICCAMS 2025)

The 2nd IEEE International Conference on New Frontiers in Communication, Automation, Management, and Security (ICCAMS 2025) was held on 11th and 12th July 2025 at Presidency University, Bengaluru. It was organized by the School of Computer Science and Engineering and the School of Information Science, under the leadership of Conference Chair Dr. S. Pravinth Raja and Organising Chair Dr. Shanmugarathinam G.

The grand inaugural was graced by Dr. V. Narayanan, Chairman of ISRO, as Chief Guest, and Dr. Makarand Madhav Ghangrekar, Director of NIT Puducherry, as Guest of Honor. The ceremony was presided over by Dr. Nissar Ahmed, Chancellor, along with Dr. Thiruvengadam, Vice Chancellor, Dr. Shivaperumal and Dr. Vidhya Shankar Shetty, Pro Vice Chancellors, and Dr. Sameena Noor Ahmed Panali, Registrar. The Guard of Honor by NCC cadets and a documentary on ISRO's achievements set an inspiring tone, followed by the ceremonial lamp lighting.

In his keynote address, Dr. Narayanan spoke about India's future space missions, academia–ISRO collaborations, and the role of young researchers. The printed proceedings were also released during the inaugural. Other keynotes included Dr.-Ing. Swati Chandana (Germany) on ethical AI and Prof. Dr. Reiner Creutzburg (Germany) on global data science perspectives.

The conference received over 1,400 submissions, of which 300 peer-reviewed papers were presented across 10 tracks by researchers from India and abroad, including participants from the USA, Germany, Japan, South Africa, Russia, and Oman. Panel discussions with experts from IITs, NITs, and industry leaders addressed AI in healthcare, smart systems, and sustainable technologies.

The valedictory was graced by Dr. Sherimon P. Cherian (Oman), where Best Paper Awards were presented and session chairs were honored. The event concluded with the national anthem, marking the successful completion of ICCAMS 2025, a global platform for innovation and collaboration at Presidency University.

2nd IEEE International Conference on New Frontiers in Communication, Automation, Management and Security (ICCAMS 2025)

DEPT NEWS

Commencement Programme of B.Tech, B.Sc. and BPT

The School of Computer Science & Engineering and the School of Engineering at Presidency University organized their Orientation Program 2025 from July 30 to August 8, 2025, to warmly welcome the incoming batch of students. The inaugural ceremony, held at the Main Pandal, began with the lighting of the lamp, followed by inspiring addresses from distinguished guests including Dr. Ram Prasath Manohar, IAS (Chairman, BWSSB) and Dr. K. Rajalakshmi Menon (Director General, DRDO), along with messages from university leaders who introduced students to academic regulations, placement opportunities, entrepreneurship, campus life, and support services.
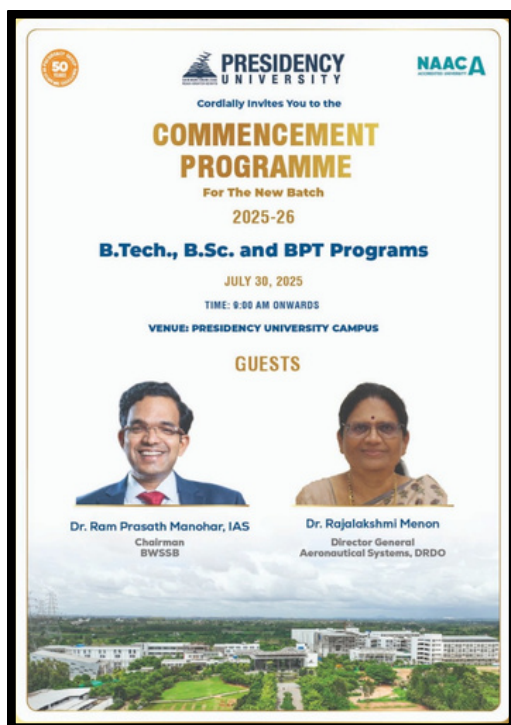
Over the following days, the Orientation unfolded into a vibrant mix of Academic Readiness Programs designed to ignite the spirit of innovation and teamwork. Students participated enthusiastically in hands-on workshops on robotics, drone building, 3D printing, and coding challenges, as well as sessions on smart cities, emerging technologies, communicative English, and personality development. Each session not only strengthened their technical foundation but also encouraged them to embrace problem-solving, collaboration, and leadership.

Beyond academics, the program also highlighted the university's focus on holistic student growth. Sessions on library services, counselling and wellness, discipline, sports, gender sensitization, scholarships, mentoring, and housing reassured students of the robust support system available to them on campus. These interactive engagements allowed the new batch to connect with faculty mentors, explore opportunities for entrepreneurship and innovation, and develop a sense of belonging within the Presidency community.

As the students stepped into this new phase of their academic life, the program ensured they did so with enthusiasm, motivation, and a clear vision of success.

Commencement Programme of B.Tech, B.Sc. and BPT

DEPT NEWS

Faculty Induction Program 2025-2026

Day 1: Building Academic Foundation

Day 1 began with the Lighting of the Lamp, followed by addresses from Dr. Thiruvengadam S. J., Vice Chancellor and Dr. Sivaperumal S, Pro-Vice Chancellor. Dr. Sameena Noor Ahmed Panali, Registrar introduced key officials, schools, and admission processes. Later, Dr. Sivaperumal S spoke on academic regulations, while Dr. Dileep R. outlined Ph.D. policies. Post-lunch, Dr. Badri H. S. presented on accreditation and IQAC frameworks. The day offered faculty a clear overview of the university's academic and research ecosystem.

Day 2: Institutional Practices & Faculty Engagement

The second day emphasized operational guidelines, covering HR policies, code of conduct, IT protocols, examination regulations, ERP systems, library resources, MOOC courses, and mentorship programs. Sessions on innovative projects, incubation, and LMS-based teaching encouraged technology-driven practices. The day ended with an interaction with HoDs and a closing ceremony that captured faculty experiences and expectations.

DEPT NEWS

Faculty Development Program on Next-Gen Intelligence: From Machine Learning to Generative Agents

The 10-day Faculty Development Programme (FDP) on "Next-Gen Intelligence: From Machine Learning to Generative Agents" was organized by the School of Computer Science and Engineering, Presidency University, from 14th to 25th July 2025. The sessions covered a wide spectrum of AI domains including Machine Learning, Deep Learning, Reinforcement Learning, NLP, Explainable AI, Responsible AI, Generative AI, and AI Agents.. Eminent speakers from academia and industry delivered lectures, hands-on coding sessions, and real-world case studies.

The FDP emphasized not only technical expertise but also ethics, interpretability, and responsible AI practices. Participants gained exposure to tools like TensorFlow, Keras, Hugging Face, and AIF360, enhancing both teaching and research capabilities. The program concluded with positive feedback, reflecting its success in bridging academic knowledge with industry-driven AI applications. The event was coordinated by Ms. Josephine R., Assistant Professor and Mr. Jai Kumar B, Assistant Professor.
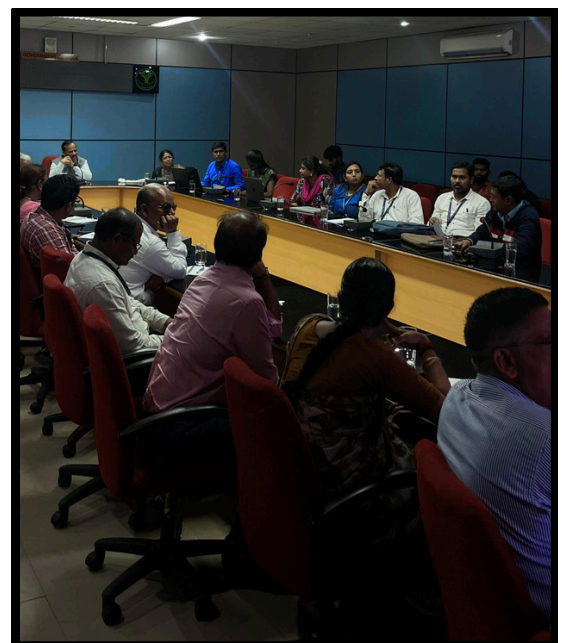
DEPT NEWS

FDP on OBE Framework: Transforming Teaching–Learning Practices

The School of Computer Science and Engineering organized a Faculty Development Programme on "OBE Framework: Transformation in Teaching–Learning Process" on 2nd July 2025. The session, delivered by Dr. Thiruvengadam S J-Vice Chancellor, focused on OBE philosophy, curriculum alignment, and learner-centric teaching approaches. Faculty members actively engaged in discussions on assessment strategies and accreditation requirements. The event received positive feedback for its relevance and practical insights. It was convened by Dr. Zafar Ali Khan N and coordinated by Ms. Smitha S P.

Tech Meets Agriculture: ICAR-IIHR & Presidency University Partnership

ICAR-IIHR, Bengaluru, and Presidency University joined hands on 14th July 2025 to explore innovations in digital horticulture. The brainstorming session highlighted projects ranging from AI-enabled pollination and pesticide robots to IoT-based smart packaging and early disease detection in crops. Scientists and academicians presented solutions for sustainable farming, precision agriculture, and crop health monitoring. The discussions reflected a strong synergy between research and technology. Director Dr. T.K. Behera applauded the collaborative spirit, emphasizing the need for consistent dialogue and regular progress reviews.
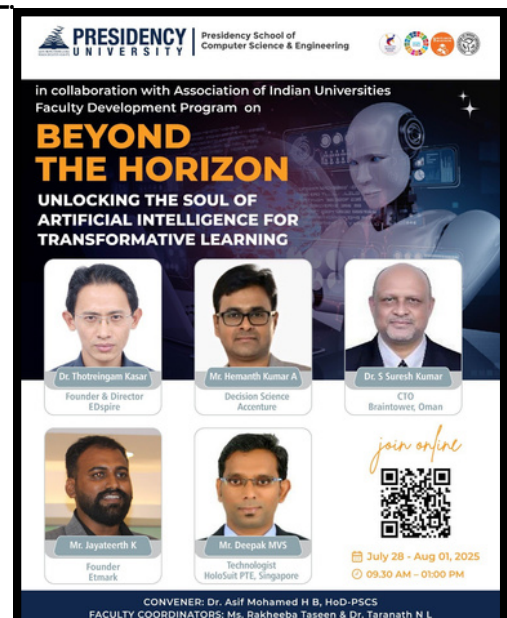
DEPT NEWS

Empowering Healthcare with AI: ATAL VAANI Workshop at Presidency University

The AICTE-ATAL VAANI workshop on "Application of Artificial Intelligence in Medical Image Processing and Data Science" was held from July 24–26, 2025, at Presidency University. The three-day event blended expert lectures, real-time demonstrations, and hands-on sessions, showcasing AI's transformative role in healthcare. Participants explored deep learning, OpenCV, and medical imaging applications such as X-rays, CT, and MRI. With enthusiastic participation from faculty and scholars, the program fostered collaboration between computing and healthcare. Coordinated by Ms. Smitha S. P., Assistant Professor, and Ms. Deepthi, Assistant Professor, PSCS, the workshop received highly positive feedback for its practical insights and innovative approach.

FDP on Unlocking the Soul of AI for Transformative Learning

The Presidency School of Computer Science and Engineering, in collaboration with the Association of Indian Universities, organized a Faculty Development Program titled "Beyond the Horizon: Unlocking the Soul of Artificial Intelligence for Transformative Learning" from July 28th to August 1st, 2025. The FDP introduced educators to Generative AI, LLMs, and AR/VR tools through expert talks and interactive sessions. It aimed to bridge the gap between academic teaching and industry advancements, enabling participants to adopt future-ready learning methodologies. The event was convened by Dr. Asif Mohamed H. B., and coordinated by Ms. Rakheeba Taseen and Dr. Taranath N. L.
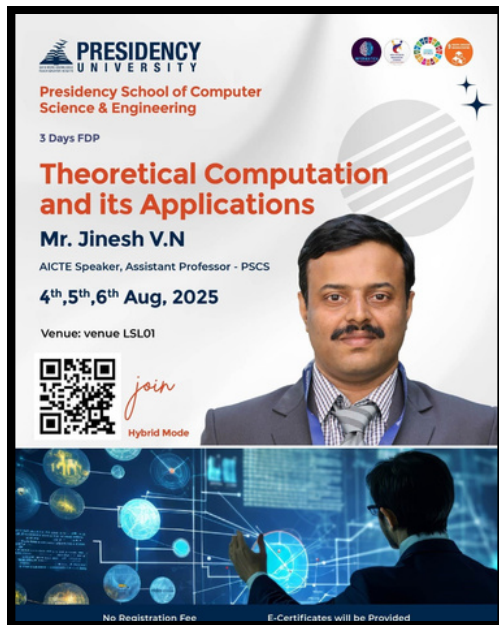
DEPT NEWS

Faculty Development Program on Theoretical Computation and its Applications

The Presidency School of Computer Science and Engineering, organized a Faculty Development Program on "Theoretical Computation and its Applications" from 4th to 6th August 2025. The sessions, conducted by Mr. Jinesh V. N., focused on automata theory, formal languages, Turing machines, and computational complexity. The FDP also emphasized practical applications in compiler design, cryptography, AI, and software verification. Hands-on activities and interactive discussions helped participants connect theoretical concepts with real-world problem-solving. The program enriched the research and academic perspectives of faculty members and scholars. The event was successfully coordinated by Dr. Poornima S. and Ms. Sunitha B. J., with active support from student coordinators Ms. Vandhana and Ms. Aishwarya.

Pre Conference Workshop

The Pre-Conference Workshop of the 2nd IEEE International Conference on New Frontiers in Communication, Automation, Management, and Security (ICCAMS 2025) was held on 10th July 2025 at Presidency University, Bengaluru, organized by the School of Computer Science and Engineering and the School of Information Science. The workshop was chaired by Dr. S. Pravinth Raja and coordinated by Dr. Vetrimani Ilangovan. Eminent speakers including Mr. Ilan Sezhiyan Jayaraman (AI & Automation Expert), Mr. Bhanu Prakash Gopularam (Apple India), and Dr. Sumit Narula (Amity University) delivered engaging sessions on secure automation, communication technologies, and ethical academic publishing. The workshop provided valuable insights to students, researchers, and faculty, and concluded with certificate distribution to all participants.

DEPT NEWS

Presidency University Students at Summer Training Program 2025, IIT Kanpur

TThe Summer Training Program 2025 at IIT Kanpur, organized by the School of Computer Science and Engineering – HARVEST CLUB in collaboration with EITC, provided an intensive learning experience for students of Presidency University. A total of 30 students participated, gaining exposure to advanced domains such as Artificial Intelligence, Generative AI, Cybersecurity, Full Stack Development, Python for Data Science, and AI for Managers. The highlight of the program was the 7-day residential immersion at IIT Kanpur from 26th June to 2nd July, where participants attended expert-led sessions on cutting-edge technologies including ChatGPT, Data Science, and Drone Technology.
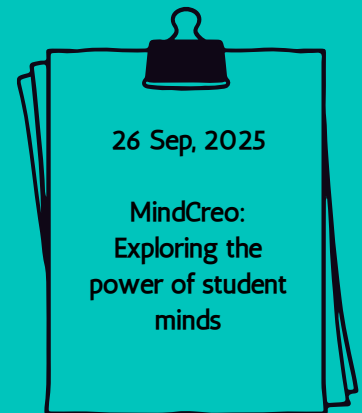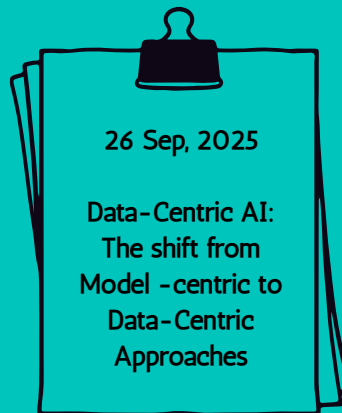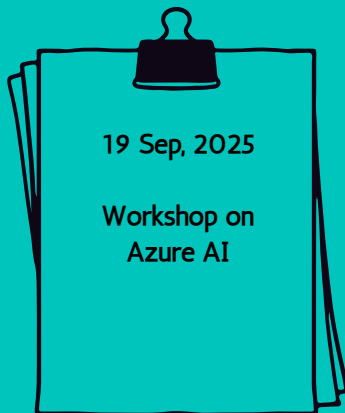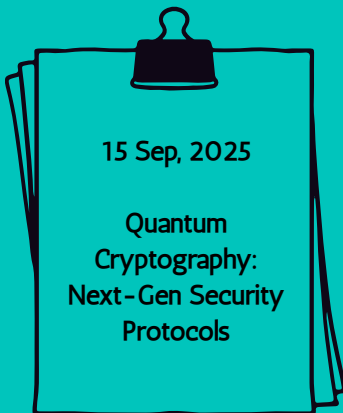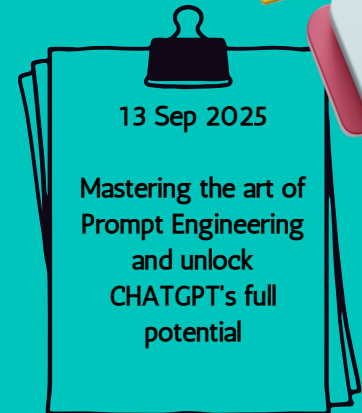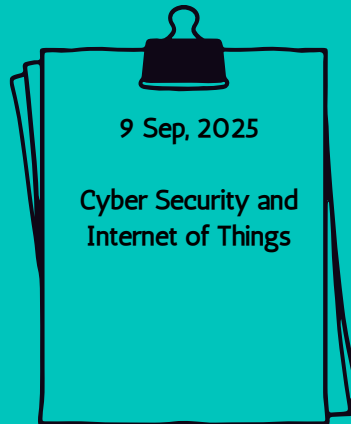
This initiative was made possible under the guidance of Convener Dr. Zafar Ali Khan N, Professor and HOD (CSE-CAI, ISE & RAI), whose vision for student growth in emerging technologies has been exemplary. The program's seamless execution was ensured by Coordinator Ms. Josephine R, Assistant Professor, School of CSE, whose dedication and support played a crucial role in its success. The training not only enhanced technical proficiency but also inspired students to pursue innovation and future research opportunities, making it a truly transformative experience.

The program has set a strong benchmark for future collaborations with IIT Kanpur and created a pathway for Presidency students to excel in research and innovation.

UPCOMING EVENTS

3 Sep, 2025

Orientation of MCA, M.Tech Programme

9 Sep, 2025

Cyber Security and Internet of Things

13 Sep 2025

Mastering the art of Prompt Engineering and unlock CHATGPT's full potential

15 Sep, 2025

Quantum Cryptography: Next-Gen Security Protocols

19 Sep, 2025

AI in Cybersecurity: Threat Detection

19 Sep, 2025

Hands-on SDP: Smart Contracts and Blockchain Development

19 Sep, 2025

Workshop on Azure AI

26 Sep, 2025

Data-Centric AI: The shift from Model -centric to Data-Centric Approaches

26 Sep, 2025

MindCreo: Exploring the power of student minds

STUDENT'S CORNER

Women's Contribution in the Field of AI

From the birth of the first computer in the 19th Century to the modern breakthroughs in the field of AI, visionaries like Ada Lovelace, Grace Hopper, Dr. Fei-Fei Li and many more have continuously contributed in the field of AI. Their stories show that innovation in AI is not just about algorithms and data, but about people who dare to think beyond the limits of their own capacities.

1. Ada Lovelace

Often known as the world's first programmer, Ada Lovelace envisioned the capability of a computer to transcend mere calculations, thereby making foundational contributions in field of AI. While Charles Babbage focused on the creation of his 'Analytical Engine' which stressed upon the machine's mechanical and computational capability, Lovelace looked at a possibility beyond that. She ideated about the machines ability to create music, art and symbols and to perform tasks which mirror the modern-day AI's calibre to learn, reason and create.

2. Grace Hopper

Grace Hopper, a pioneer in the field of computer programming, was the first to devise the theory of machine-independent programming languages, and used this theory to develop the FLOW-MATIC programming language and COBOL, an early high-level programming language still in use today. Her most significant achievement is however the invention of the world's first compiler. By laying these groundworks for programming language, Hopper created essential tools that allow the modern-day AI systems to be trained.

3. Dr. Fei-Fei Li

Another eminent figure in this field is Dr. Fei-Fei Li, a world-renowned AI researcher and a pioneer in computer vision and deep learning. She co-founded the Stanford Human-Centered AI Institute and has also been a part of The Google Cloud AI & Machine Learning department as the chief scientist. Among her best-known work is the 'ImageNet' project, which revolutionized the field of large-scale visual recognition. Through its annual ImageNet Large Scale Visual Recognition Challenge (ILSVRC), researchers saw just how much better deep neural networks could perform compared to older methods—especially after the game-changing 2012 AlexNet model.

Khushi Singh
Student
BCA-AI &ML

STUDENT'S CORNER
The Intersection Of Engineering And AI

AI in Engineering
- In biomedical fields, AI processes massive data to design solutions once impossible.
- In manufacturing, predictive maintenance reduces downtime and repair costs.

Smarter Information Access
- Data Insights: Predictive analytics, real-time processing, and pattern recognition enable smarter decisions.
- Intelligent Search: AI understands intent, personalizes results, and breaks language barriers with translation.
- Content Creation: Generative AI produces text, images, and reports while personalizing communication and improving accessibility.

Coding as a Core Skill
- Coding powers apps, systems, networks, and smart devices—making it essential for modern engineers.

Technology and Innovation
- Breakthroughs like 3D printing, quantum computing, biotechnology, IoT, and edge computing are reshaping industries

The Maker Movement
- DIY engineering, robotics, 3D printing, and makerspaces foster creativity, collaboration, and STEM learning.

Student Life and Perspectives
- Student life encourages cultural exchange, collaboration, and global outlook—building skills for a connected world.

Mohammed Asjad,
Student, BCA

STUDENT'S CORNER

🌿 Green Computing and Sustainable Technology 🌿

As a student learning about computers and technology, I've discovered that green computing is a really important concept in today's world. It means using computers and other digital devices in a way that doesn't harm the environment. This includes designing energy-efficient hardware, using software that doesn't waste power, and finding ways to reduce electronic waste. With the rise of cloud computing and virtualization, we can now do more with fewer machines, which helps save energy and resources.

Sustainable technology goes hand in hand with green computing. It focuses on creating long-term solutions that protect the environment while still allowing us to enjoy the benefits of modern technology. For example, some companies are now using solar or wind energy to power their data centers, and others are recycling old devices instead of throwing them away. These efforts show that technology can be both powerful and eco-friendly if we use it wisely.

As a student, I feel it's our responsibility to learn about these practices and apply them in our future careers. Whether we become software developers, IT managers, or tech entrepreneurs, we can make choices that support sustainability. By being aware of how our actions affect the planet, we can help build a future where technology and nature work together, not against each other.

Anushka Raj
Student
BCA AI & ML

Guardians of the Digital Age

The internet is a big university campus—wonderful possibilities, profound connections, and, yes, some not-so-obvious risks. That's why studying cybersecurity isn't just an academic exercise, but a vital life skill for anyone who lives in today's digital world. It's about protecting your data, your work, and even your university from those who would seek to do harm.

As a Presidency University student, you have a strong role to play: you're not only a technology user, but you could be its guardian too. Perhaps you'll become an ethical hacker, discovering flaws before the nefarious types get there first, or maybe you'll create the next wave of secure apps that make people's lives simpler and safer. Each lesson that you receive about encryption, network security, or password management brings you closer to a world where trust in technology is the rule rather than the exception.

But past the code and the tech-speak, cybersecurity is about people. It's about protecting the classmates whose privacy you safeguard, the families whose information remains secure, and the community you empower. By being responsible and ethical, you're not only doing your part—you're expressing concern for others. Isn't that what it means to be human (and an awesome techie)?

Jishnu Ashokan
Student, BCA

UNWIND ZONE

ACROSS

3. The entire span of an asset from creation to retirement
4. Devices that collect real world information for the twin
6. A digital twin is this type of nonphysical representation
8. The essential resource that powers all digital twin functionality
9. Industry where digital twins can model patients for treatment
10. A key advantage of digital twins using data to foresee outcomes

DOWN

1. Data into a digital twin that arrives instantly without delay
2. Industry that first used digital twins to monitor jet engines
4. A digital twin often runs this to forecast future behavior
5. Urban planners use digital twins to design and manage these
7. Acronym for the Internet of Things which powers connectivity
.
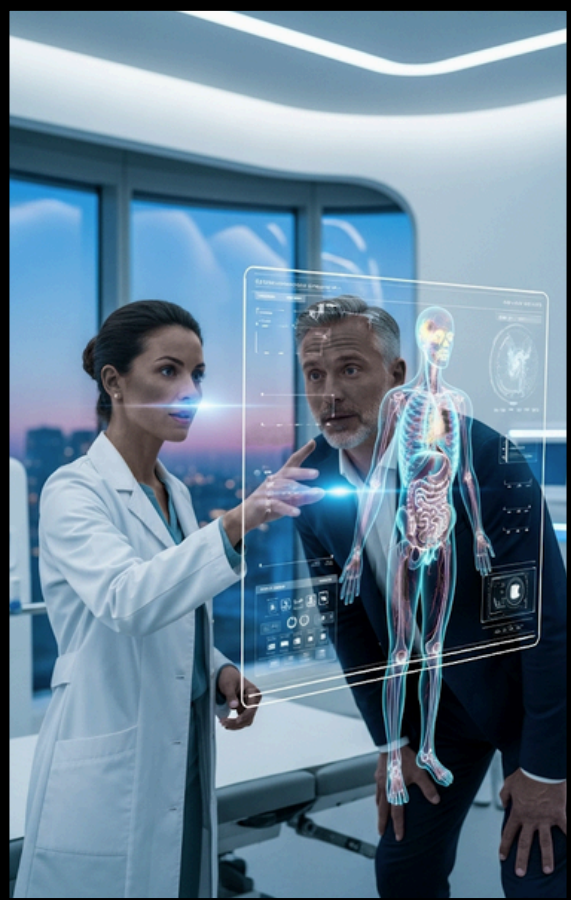
THE DIGITAL TWIN GAME
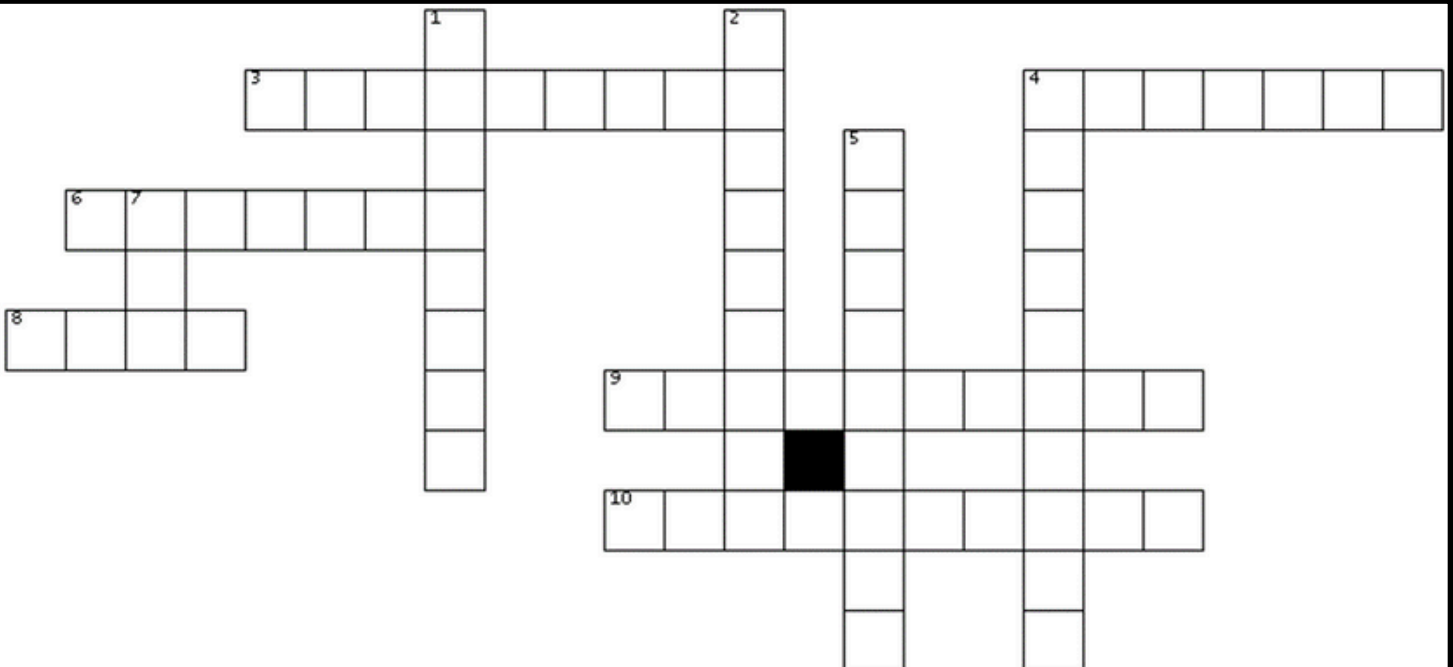
Best Seller

Book Review

DIGITAL TWIN TECHNOLOGY

Book Review: Digital Twin Technology - A Simplified Guide for Everyone
Author: Nova Martian
Genre: Technology / Beginner-Friendly Guide
Rating: ★★★★☆ (4/5)

In today's rapidly evolving digital era, digital twin technology is reshaping industries from healthcare to smart cities. Nova Martian's Digital Twin Technology: A Simplified Guide for Everyone serves as an accessible introduction to this powerful concept. Instead of overwhelming the reader with heavy technical jargon, the book breaks down complex ideas into simple explanations, supported by relatable examples and case studies.

The author explores not only how digital twins function but also why they matter—covering applications, benefits, ethical concerns, and the future potential of this transformative technology.

⭐ Why Read It?

- Understand the basics of digital twin technology without technical overload
- Explore real-world use cases across industries
- Get a glimpse into the future of innovation and virtual modeling

✅ Strengths

- Clear, simple writing style ideal for beginners
- Covers social and ethical aspects, not just technical details
- Engaging case studies that make the subject relatable

⚠️ Criticism & Limitations

- Lacks deep technical depth for advanced readers
- More of an overview than a hands-on manual
- Professionals may find it too introductory

⭐ Final Verdict

A highly readable gateway book into the world of digital twins—perfect for students, enthusiasts, and non-technical readers curious about this emerging technology. While experts may seek more advanced resources, Nova Martian delivers an engaging and insightful guide that makes a complex topic approachable.

Warm Regards,
The Editorial Board
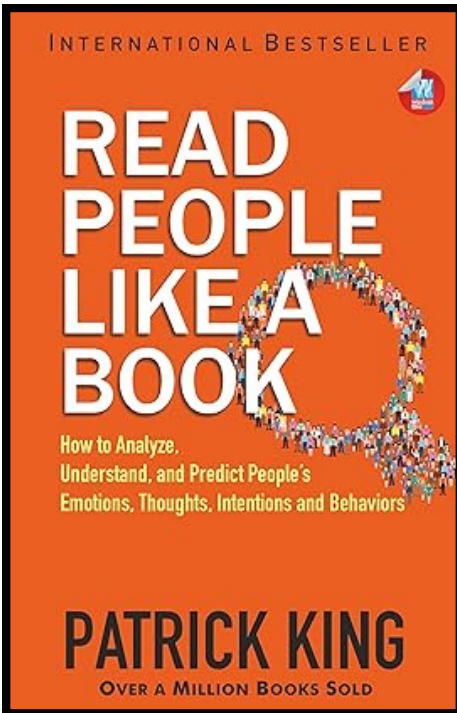
READ PEOPLE LIKE A BOOK

BOOK REVIEW: READ PEOPLE LIKE A BOOK
AUTHOR: MR. PATRICK KING
GENRE: SELF-HELP
RATING: ★★★★★ (5/5)

In Read People Like a Book, Patrick King—social interaction specialist and human behaviour analyst—offers practical strategies for understanding people beyond words. The book focuses on body language, emotional cues, micro expressions, and subtle behavioural patterns that reveal hidden thoughts and motives. Written in a simple and accessible way, it helps readers sharpen observational skills, improve communication, and build stronger connections.

Patrick King emphasizes that this skill is not about manipulation, but about developing empathy and awareness. With relatable examples and actionable insights, the book makes complex social cues easy to understand and apply in daily life. It is especially valuable for anyone looking to navigate relationships, negotiations, or professional interactions with greater confidence.

✅ Strengths

- Easy-to-follow explanations with real-life examples.
- Practical tips for interpreting body language and non-verbal communication.
- Focus on everyday applications—useful for relationships, business, and leadership.
- Written in a conversational, accessible tone suitable for all readers.

⚠️ Criticism & Limitations

- Lacks deep scientific detail for readers seeking advanced psychology.
- Some concepts are generalized and may not apply universally.
- Can feel repetitive across chapters.

⭐ Final Verdict

Read People Like a Book is an insightful, practical guide for anyone interested in decoding human behavior and improving social awareness. While it is not a deep dive into academic psychology, its strength lies in its simplicity and applicability to everyday life. A helpful read for professionals, leaders, and anyone who wants to connect more effectively with others.

Warm Regards,
The Editorial Board

THE WRAP UP

As we bring this edition to a close, we turn our lens toward one of the most disruptive innovations shaping the digital era—Digital Twins. By bridging the gap between the physical and the virtual, digital twins are transforming industries, decision-making, and the very way we design, monitor, and optimize systems.

Key Takeaways from This Edition

- Real-Time Mirroring & Predictive Insights – Digital twins replicate physical assets in real time, unlocking predictive analytics, proactive maintenance, and smarter operational strategies.
- Design & Innovation Acceleration – From smart manufacturing to urban planning, virtual prototypes reduce costs, risks, and timelines while fueling creativity and innovation.
- Human-Centric Experiences – Digital twins are extending beyond machines to healthcare, personalized learning, and even lifestyle applications, creating deeply tailored human-centered experiences.
- Sustainability Through Simulation – By testing scenarios virtually, industries can minimize waste, optimize energy use, and foster eco-friendly development before physical deployment.
- Security & Ethical Considerations – As digital replicas grow more complex, safeguarding data integrity, privacy, and trust becomes critical to ensure responsible use.
- Convergence with IoT, AI & Cloud – The synergy of IoT data, AI-driven insights, and cloud scalability is amplifying the capabilities of digital twins, driving autonomous systems and adaptive ecosystems.

Final Thoughts

Digital twins are not merely copies—they are living, learning, and evolving counterparts that empower us to make informed decisions, anticipate challenges, and innovate responsibly. Their true potential lies not just in mirroring the world but in helping us reshape it intelligently and sustainably.

"The question isn't whether we can replicate reality—but how wisely we use that replication to build a better future."

DIGITAL TWIN

THE POWER OF REAL TIME REPLICATION