DR.AKHILESH DAS GUPTA
INSITUTE OF PROFESSIONAL STUDIES
(Formerly Dr. Akhilesh Das Gupta Institute of Technology And Management)

ADG Institute of Professional Studies

BBD

COGNEXA
INNOVATION · TECHNOLOGY · EXCELLENCE
2025

DEPARTMENT OF COMPUTER SCIENCE

MESSAGES

Mrs. Alka Das Gupta
HON'BLE CHAIRPERSON, BBD GROUP

Innovation thrives when driven by passionate minds who lead change and transformation in the workplace. In today's rapidly evolving global environment, success lies in effectively addressing the complex and dynamic challenges of the information technology domain. The Department of Computer Science at ADGIPS consistently strives to uphold and demonstrate ideas.

At ADGIPS, we believe in delivering education rooted in awareness and values, while nurturing young individuals who are confident, motivated, and always prepared to take on new challenges. Our campus environment, sports culture, and academic infrastructure stand as strong evidence of this commitment. To ensure education that meets international standards, our primary emphasis remains on the holistic development of students.

In the present era, proficiency in computing and technology has become indispensable for managers, business leaders, entrepreneurs, and professionals across diverse fields. This progression is both timely and encouraging. I look forward to Cognexa 2025 setting new benchmarks of excellence and extend my best wishes to the Cognexa editorial team for a grand success.

– Mrs. Alka Das Gupta
HON'BLE CHAIRPERSON, BBD GROUP

MESSAGES

Sh. Viraj Sagar Das
HON'BLE PRESIDENT, BBD GROUP

I feel delighted to see that the path of creativity and innovation is consistently followed by the Department of Computer Science. The department always encourages its students to actively participate and compete in various competitions and events, providing them opportunities to showcase their abilities across new and emerging platforms of technology.

A major strength of the magazine lies in the fact that it presents a bouquet of topics that are highly relevant and interesting to all. It gives me great pleasure to learn about the various activities and achievements of the Department of Computer Science at Dr. Akhilesh Das Gupta Institute of Professional Studies through such an interactive and engaging publication. I convey my best wishes for the success of Cognexa 2025.

– Sh. Viraj Sagar Das
HON'BLE PRESIDENT, BBD GROUP

MESSAGES

Prof. (Dr.) Niranjan Bhattacharyya
DIRECTOR, ADGIPS

Dr. Akhilesh Das Gupta Institute of Professional Studies (ADGIPS) continues its successful journey as a premier technical institution, having completed over two decades of academic excellence. Over the years, it has firmly established itself as one of the most preferred institutes for Engineering, Management, and Law.

Today, we stand among the leading education providers within the GGSIPU system. Our academic results remain exemplary, both in terms of merit and placement achievements. Our students are placed in reputed national and international organizations, and many continue to pursue higher studies abroad. The recent years have been both challenging and rewarding, further strengthening our commitment to quality education.

The Babu Banarsi Das International Group of Educational Institutions has evolved as a strong symbol of quality education, dedicated to nurturing the talent and aspirations of the dynamic, vibrant, and bright youth of our nation. In the current globalized environment, there is an increasing emphasis on learner-centric quality, continuous upgradation, advanced infrastructure, and innovative teaching-learning processes. The economic and technological progress of any country significantly depends on institutional performance and technology-driven educational practices. Dr. Akhilesh Das Gupta Institute of Professional Studies, New Delhi, continues to implement such practices to develop future-ready professionals capable of meeting the evolving demands of society. Our students are creative, skilled, and highly professional.

– Prof. (Dr.) Niranjan Bhattacharyya
Director, ADGIPS

MESSAGES

Prof. (Dr.) Uma Rani
Head of the Department

It gives me great pleasure to present this edition of the Department of Computer Science magazine, which highlights the academic excellence, innovation, and achievements of our students and faculty. The department is committed to creating a dynamic learning environment that promotes technical competence, critical thinking, and professional growth among students.

During the academic year 2024-25, the department successfully organized various academic and technical activities such as expert lectures, technical events, project exhibitions, industrial visits, and competitions. These initiatives provided students with valuable exposure to emerging technologies and helped them develop practical skills, teamwork, and leadership qualities essential for the modern technology-driven world.

As the field of computer science continues to evolve rapidly, the department places strong emphasis on emerging areas such as Artificial Intelligence, Data Science, Cyber Security, and Cloud Computing. I sincerely appreciate the efforts of the faculty, students, and editorial team in bringing out this magazine and wish our students continued success in their academic and professional journeys.

– Dr. Uma Rani
Head of the Department
Department of Computer Science, ADGIPS

DEPARTMENT OF COMPUTER SCIENCE

VISION

To empower students with the knowledge, skills, and mindset to drive innovation, solve real-world challenges, and shape the future technology.

MISSION

Mission 1: To build a strong foundation in computer science, programming, and software development, enabling students to design and implement cutting-edge solutions for real-world challenges.

Mission 2: To cultivate analytical thinking, problem-solving abilities, and computational skills, empowering students to tackle complex challenges with data-driven decision-making.

Mission 3: To instill a culture of continuous learning and adaptability, preparing students to embrace emerging technologies and excel in an ever-evolving digital landscape.

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Department of Computer Science Magazine | Academic Year 2024-25

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◆ DEPARTMENT AT A GLANCE

Department of Computer Science | Academic Year 2024–25

🎓 ABOUT THE DEPARTMENT

The Department of Computer Science at Dr. Akhilesh Das Gupta Institute of Professional Studies (ADGIPS) is committed to delivering quality technical education that blends strong theoretical foundations with practical, industry-oriented learning. The department focuses on nurturing innovation, problem-solving skills, and professional excellence among students.

📚 ACADEMIC PROGRAM

- B.Tech – Computer Science

🧠 CORE FOCUS AREAS

- Artificial Intelligence & Machine Learning
- Data Science & Analytics
- Cyber Security
- Cloud Computing
- Web & Software Development
- Emerging Technologies

🎓 STUDENT PROFILE

- 150+ Active Students
- Participation in national & international competitions
- Strong emphasis on projects, hackathons, and innovation

👩‍🏫 FACULTY EXCELLENCE

- Experienced and dedicated faculty members
- Active involvement in research, FDPs, workshops, and seminars
- Continuous mentoring for academic and career growth

🧩 DEPARTMENTAL SOCIETY

CompTech Scientia

- Platform for technical, creative, and competitive activities
- Organizes quizzes, hackathons, exhibitions, and workshops
- Encourages leadership, teamwork, and innovation

🏭 INDUSTRY & INNOVATION

- Expert lectures by industry professionals
- Industrial visits for real-world exposure
- Project-based learning and exhibitions
- Skill development through certifications and internships

EVENTS & ACTIVITIES

A glimpse of technical and creative events organized by the Department of Computer Science.

Dr. Akhilesh Das Gupta Institute of Professional Studies
FC-26, Shastri Park, Delhi-110053
Approved by AICTE, BCI and Affiliated to GGSIPU

Department of Computer Science
Presents

CREATIVERSE DEBATE

TIME
11:30 AM ONWARDS

DATE
15TH OCTOBER 2025

VENUE
3205, 3RD BLOCK

FACULTY CO-ORDINATOR
TUSHA GUPTA

STUDENT CO-ORDINATOR
KHUSHI BHARDWAJ : 8882035057
CHARMY KHAPRA : 8800676510

(Formerly Dr. Akhilesh Das Gupta Institute of Technology & Management)
FC-26, Shastri Park, Shahdara, Delhi 110053

COMPTECH SCIENTIA X THE INVINCIBLES

BGMI SHOWDOWN

REQUIREMENT PHONE & INTERNET

ARE YOU READY FOR AN ULTIMATE BATTLE ?

DATE: 15TH SEPTEMBER
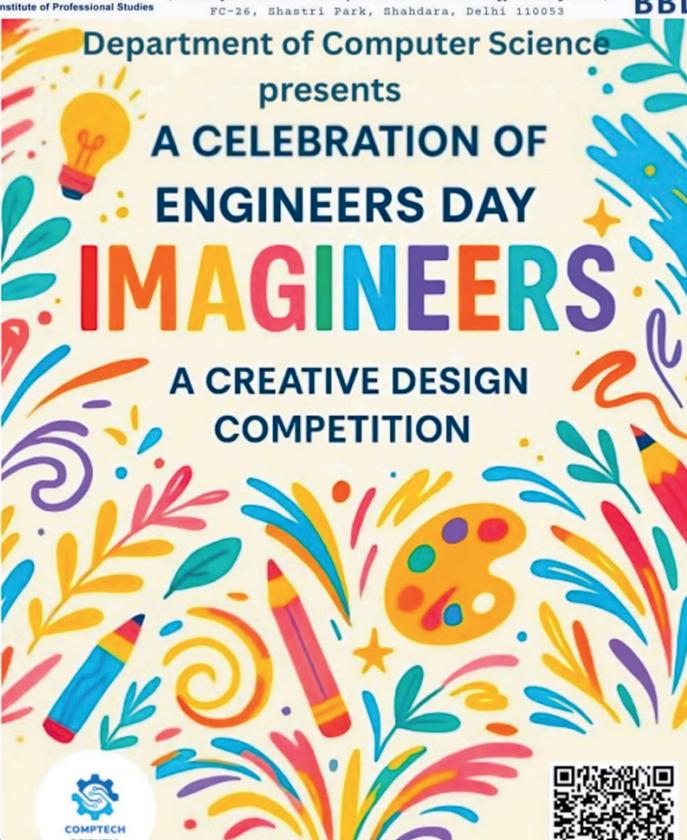VENUE: 3RD BLOCK, 2ND FLOOR

(Formerly Dr. Akhilesh Das Gupta Institute of Technology & Management)
FC-26, Shastri Park, Shahdara, Delhi 110053

Department of Computer Science
presents

A CELEBRATION OF ENGINEERS DAY
IMAGINEERS

A CREATIVE DESIGN COMPETITION

COMPTECH SCIENTIA

Dr. Akhilesh Das Gupta Institute of Professional Studies
FC-26, Shastri Park, Delhi-110053
Approved by AICTE, BCI and Affiliated to GGSIPU

Department of Computer Science
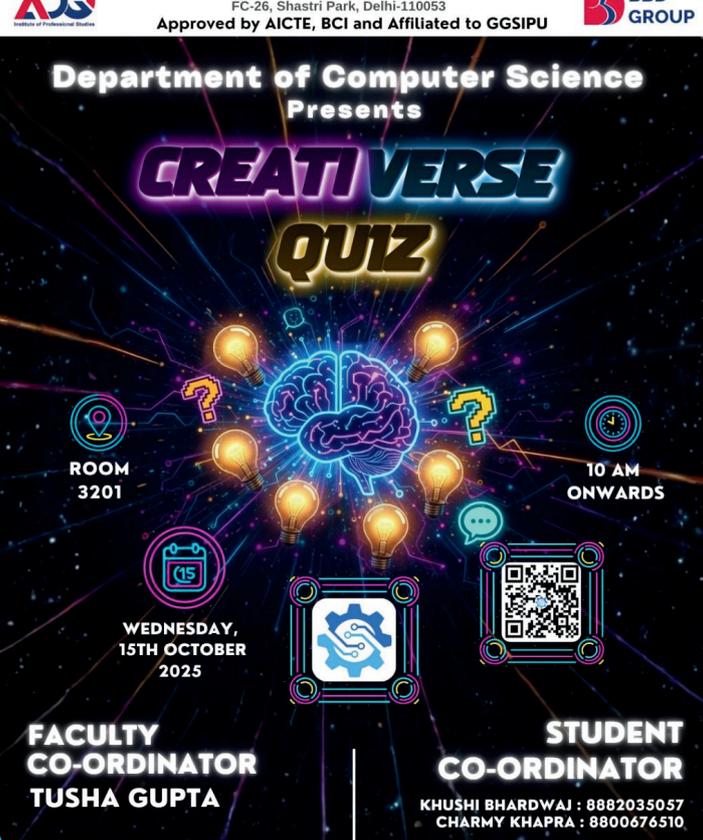Presents

CREATIVERSE QUIZ

ROOM 3201

10 AM ONWARDS

WEDNESDAY, 15TH OCTOBER 2025

FACULTY CO-ORDINATOR
TUSHA GUPTA

STUDENT CO-ORDINATOR
KHUSHI BHARDWAJ : 8882035057
CHARMY KHAPRA : 8800676510

Posters represent departmental events conducted during Academic Year 2024–25.

🎉 COMPTECH SCIENTIA INAUGURATION CEREMONY

CompTech Scientia – Departmental Society of Computer Science

Department of Computer Science
Date: 15 September 2025
Venue: Block 2 (Seminar Hall) & Block 3, ADGIPS
Occasion: Engineer's Day Celebration 2025

Inauguration Overview

The Department of Computer Science, Dr. Akhilesh Das Gupta Institute of Professional Studies, proudly inaugurated its official departmental society, CompTech Scientia, on the occasion of Engineer's Day Celebration 2025. The inauguration marked a significant milestone in the department's journey toward fostering innovation, creativity, and technical excellence among students.

Dignitaries Present

The inauguration ceremony was held in the esteemed presence of:

- **Prof. (Dr.) Niranjan Bhattacharyya – Director, ADGIPS**
- **Dr. Uma Rani – Head of Department, Computer Science**
- **Departmental Heads and Distinguished Faculty Members**

Their presence and guidance added great value to the event and motivated students to actively participate in academic and technical initiatives.

Vision & Purpose of CompTech Scientia

CompTech Scientia has been established with the vision to:

- Promote technical learning and innovation
- Encourage student-led initiatives and competitions
- Provide a platform for skill development, collaboration, and leadership
- Bridge the gap between theoretical knowledge and practical application

The society aims to nurture future-ready professionals by organizing technical events, workshops, competitions, expert lectures, and exhibitions throughout the academic year.

Outcome

The Scientia Inauguration Ceremony successfully set the tone for an engaging and innovative academic year. It inspired students to explore technology beyond classrooms and actively contribute to the department's vibrant technical culture.

🎉 ENGINEER'S DAY CELEBRATION 2025

Event organized by CompTech Scientia Society

Department of Computer Science

Date: 15 September 2025

Venue: Block 2 (Seminar Hall) & Block 3, ADGIPS

Time: 9:30 AM onwards

Event Overview

The Department of Computer Science, Dr. Akhilesh Das Gupta Institute of Professional Studies, celebrated Engineer's Day 2025 with great enthusiasm to commemorate the birth anniversary of Sir M. Visvesvaraya. The event was themed "Innovation Unleashed: A Day of Creativity and Competition", aiming to encourage innovation, teamwork, and problem-solving among students.

The celebration began with the inauguration of the departmental society "CompTech Scientia" in the presence of Prof. (Dr.) Niranjan Bhattacharyya (Director, ADGIPS) and Dr. Uma Rani (HOD, Computer Science), marking a significant milestone in promoting technical and creative excellence.

Major Events Conducted

BGMI Showdown – Battle for Glory

An exciting esports competition where over 50 participants showcased strategic thinking, coordination, and gaming skills.

Winner: 🥇 Dilshan

Faculty Coordinator: Ms. Asfiya Zaidi

Quizingo – Where Quiz Meets Bingo

A unique blend of technical quiz and bingo conducted in two rounds, testing technical knowledge and quick thinking.

Winners: 🥇 Drishti Sahu | 🥈 Yash | 🥉 Himanshu Sharma

Faculty Coordinator: Ms. Tarina Jayant

Imagineers – Creative Design Competition

A design challenge where students created innovative designs using tools like Canva and Photoshop.

Winners: 🥇 Sanchi Goyal | 🥈 K. Sahinandan

Faculty Coordinator: Ms. Tusha Gupta

Event Coordination

Faculty Coordinator: Ms. Tarina Jayant

Student Coordinators: Ms. Charmy Khapra, Ms. Khushi Bhardwaj

🎮 BGMI SHOWDOWN – BATTLE FOR GLORY

E-Sports Event organized by CompTech Scientia Society under Engineer's Day Celebration 2025

Department of Computer Science

Date: 15 September 2025

Venue: Lab 5-6, Block 3 (2nd Floor), ADGIPS

Organized By: Department of Computer Science
& CompTech Scientia Society

Event Overview

The BGMI Showdown – Battle for Glory brought the excitement of e-sports to the Engineer's Day celebration, offering students a platform to demonstrate strategic thinking, teamwork, and quick decision-making. More than 50 participants formed squads and competed in intense elimination rounds, making the event both competitive and engaging.

The event aimed to promote analytical thinking, coordination, and stress management–essential skills for modern engineers– while providing an enjoyable and interactive learning experience.

Highlights

- Conducted in collaboration with The Invincibles Gaming Community ensuring smooth and fair gameplay
- Multiple elimination rounds leading to an exciting grand finale
- High student engagement with an energetic audience cheering for teams
- Winners rewarded with digital subscriptions to support learning and creativity

Winner

🥇 **Dilshan**

Outcome

The BGMI Showdown successfully blended entertainment with strategy, encouraging healthy competition and teamwork. The event reflected the innovative and dynamic spirit of engineering while fostering collaboration and skill development among students.

Event Coordination

Faculty Coordinator: Ms. Asfiya Zaidi
Student Coordinators: Vishal Singh, Ankit Raj

🧠 QUIZINGO – WHERE QUIZ MEETS BINGO

Quiz Competition organized under Engineer's Day Celebration 2025

Department of Computer Science
Date: 15 September 2025
Venue: Seminar Hall, Block 2, ADGIPS
Organized By: Department of Computer Science
& CompTech Scientia Society

Event Overview

Quizingo – Where Quiz Meets Bingo offered a unique and engaging learning experience by blending the excitement of Bingo with the challenge of a technical quiz. The event covered questions from computer science, emerging technologies, general aptitude, and current innovations, promoting logical thinking, quick responses, and active participation.

Event Structure

- **Round 1 – Bingo Round:** Participants marked Bingo cards for each correct answer; students completing a Bingo advanced to the next round.
- **Round 2 – Rapid Fire Round:** The top 10 finalists faced rapid–fire technical questions testing accuracy, speed, and presence of mind.

Participation

More than 50 students from various academic years participated enthusiastically. The innovative format kept the energy high while ensuring fair and healthy competition.

Winner

- 🥇 1st Place (Bingo Round): Himanshu Sharma
- 🥇 1st Place (Final Round): Drishti Sahu
- 🥈 2nd Place: Yash
- 🥉 3rd Place: Himanshu Sharma

Outcome

Quizingo proved to be a stimulating fusion of logic, luck, and learning, encouraging critical thinking and collaborative learning in an enjoyable academic environment.

Event Coordination

Faculty Coordinator: Ms. Tarina Jayant
Student Coordinators: Ms. Khushi Bhardwaj, Ms. Mahima Bhatt

🎨 IMAGINEERS – CREATIVE DESIGN COMPETITION

Creative Event organized under Engineer's Day Celebration 2025

Department of Computer Science

Date: 15 September 2025

Venue: Block 3, ADGIPS

Organized By: Department of Computer Science & CompTech Scientia Society

Event Overview

Imagineers – Creative Design Competition was organized to nurture creativity, innovation, and digital expression among students with an interest in graphic design and visual storytelling. The competition challenged participants to design on a surprise theme revealed on the spot, encouraging spontaneity, imagination, and design-thinking skills.

Judging Criteria

The designs were evaluated based on the following parameters:

- Creativity and originality
- Relevance to the given theme
- Aesthetic quality and visual appeal
- Innovation in concept presentation

Participation

More than 20 students enthusiastically participated in the event, using professional design tools such as Canva and Adobe Photoshop. The venue was filled with creative energy as participants transformed ideas into visually appealing digital artworks within the given time frame.

Winner

- 🥇 1st Place: Sanchi Goyal
- 🥈 2nd Place: K. Sahinandan

Outcome

Imagineers successfully highlighted the creative potential of engineering students by blending technology with artistry. The competition encouraged participants to think beyond conventional boundaries and showcased the importance of creativity and visual communication in the digital era.

Event Coordination

Faculty Coordinator: Ms. Tusha Gupta

Student Coordinators: Khrish Chauhan, Bhavik Anand

🚀 CREATIVERSE 2025

Departmental Event under Techno-Utsav 4.0

Department of Computer Science

Date: 15 September 2025
Venue: Block 3 (Rooms 3201-3205), ADGIPS
Organized By: Department of Computer Science
& CompTech Scientia Society

Event Overview

The Department of Computer Science organized Creativerse 2025, a multi-event departmental fest conducted under Techno-Utsav 4.0, the annual inter-departmental technology festival of ADGIPS. The event aimed to create a dynamic fusion of creativity, innovation, and technology, providing students with a platform to showcase their technical knowledge, creative thinking, and communication skills.

More than 50 students actively participated across various sub-events, making Creativerse 2025 one of the major highlights of Techno-Utsav 4.0.

Major Events Conducted

- **Creativerse Quiz:** A knowledge-based competition featuring multiple rounds such as MCQs, rapid-fire, and visual challenges.
- **Creativerse Graphics:** A design competition where students created digital posters on a surprise theme using Canva and Photoshop.
- **Creativerse Meme Creation:** A creative event combining humor and technology through impactful digital memes.
- **Creativerse Debate:** A platform for students to present logical arguments and demonstrate communication and reasoning skills.
- **Techno-Utsav Project Exhibition:** Students showcased innovative projects in domains like AI, ML, IoT, Web Development, and Cybersecurity.

Highlights & Outcomes

- Enthusiastic participation across all sub-events
- Promotion of technical, creative, and communication skills
- Encouraged teamwork, leadership, and innovation
- Winners and participants were awarded certificates of appreciation

Event Coordination

Faculty Coordinator: Ms. Tarina Jayant
Student Coordinators: Ms. Khushi Bhardwaj, Ms. Charmy Khapra

🧪 PROJECT EXHIBITION – INNOVATION IN ACTION

Departmental Event organized under Techno-Utsav 4.0

Department of Computer Science

Occasion: Techno-Utsav 4.0

Date: 15 October 2025

Venue: Room 3203, Block 3, ADGIPS

Organized By: Department of Computer Science

Faculty Coordinators: Dr. Uma Rani (HOD, CS) & Ms. Tarina Jayant

Event Overview

The Project Exhibition organized by the Department of Computer Science during Techno-Utsav 4.0 served as a dynamic platform for students to showcase innovative, self-developed projects. The exhibition highlighted the practical application of theoretical concepts through projects in Artificial Intelligence, Machine Learning, IoT, Web Development, and Cybersecurity, reflecting strong technical skills, creativity, and teamwork.

Student Participation & Projects

Students from the 3rd year (CS) actively participated and demonstrated their projects before faculty members and peers.


Key Project Highlights

- **CRM for Startups – Roshan Sharma**
- **Exoplanet Detection System – Priyanshu Jha**
- **UnbreakableEd – Priyanshi Chandra**
- **Projects in AI-based systems, secure applications, and web solutions by**
- **Saurabh Kumar Ray, Brij Mohan, Charmy Khapra, Abhishek Kumar, Ishaan Saklani, Shorya Tandon**

Learning Outcomes

- Hands-on exposure to real-world problem solving
- Improved presentation & communication skills
- Practical understanding of emerging technologies
- Encouragement of innovation and collaborative learning

Outcome

The Project Exhibition successfully bridged the gap between classroom learning and real-world applications. It fostered innovation, confidence, and technical competence among students, making it one of the key highlights of Techno-Utsav 4.0.
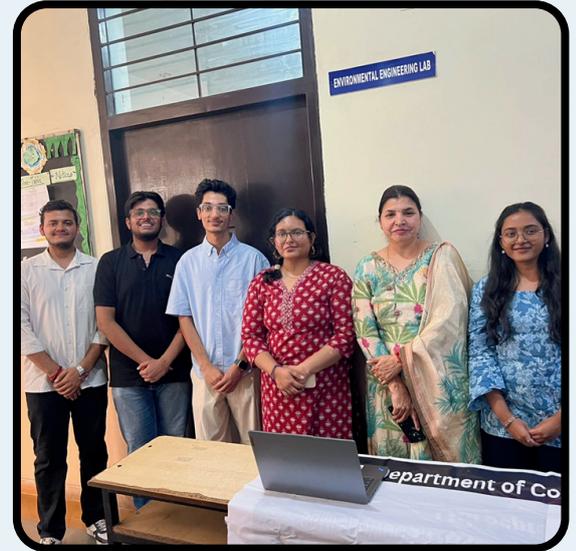
🎓 EXPERT LECTURE

Quantum AI and the Future of Secure Intelligence Systems

Department of Computer Science

Date: 7 November 2025
Mode: Online (Google Meet)
Speaker: Prof. Vivek Jaglan
Professor & Director, City Institute of Higher Learning, Moncton, Canada

Organized By: Department of Computer Science, ADGIPS
Faculty Coordinator: Ms. Tarina Jayant
Event Host: Ms. Tusha Gupta

Event Overview

The Department of Computer Science, ADGIPS, organized an insightful Expert Lecture on "Quantum AI and the Future of Secure Intelligence Systems" to expose students to emerging technologies and global research perspectives. The session explored the convergence of Quantum Computing and Artificial Intelligence, highlighting their potential to revolutionize computation, data security, and intelligent systems.

Session Highlights

Prof. Vivek Jaglan elaborated on the fundamentals of Quantum Computing, including superposition, entanglement, and qubits, and explained how these principles enable computational capabilities far beyond classical systems. He further discussed the concept of Quantum AI, emphasizing its role in enhancing machine learning efficiency, optimization, and secure data processing.
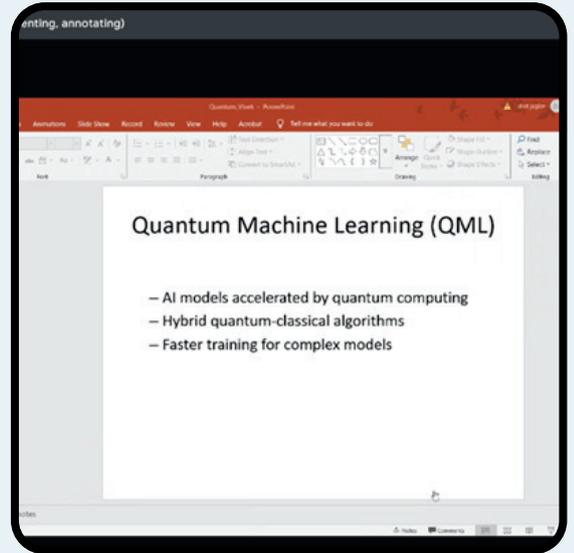
The lecture also covered advanced topics such as Quantum Cryptography, Quantum Neural Networks, and Quantum Algorithms, offering insights into their applications in next-generation cybersecurity and intelligent systems.

Participation

The session witnessed enthusiastic participation from over 60 students and faculty members. The interactive discussion allowed participants to engage with the speaker through questions related to real-world implementation, ethical considerations, and future research opportunities in Quantum AI.

Outcome

The expert lecture provided students with a futuristic perspective on Quantum Artificial Intelligence and Secure Systems, inspiring them to explore advanced research and innovation in AI, Quantum Technologies, and Cybersecurity.

🏭 INDUSTRIAL VISIT – MOTHER DAIRY, PATPARGANJ

Industrial Exposure Activity organized by the Department of Computer Science

Department of Computer Science

Date: 17 November 2025
Venue: Mother Dairy Plant, Patparganj, Delhi
Organized By: Department of Computer Science, ADGIPS
Faculty Coordinators: Ms. Asfiya Zaidi, Ms. Tusha Gupta

Visit Overview

The Department of Computer Science, ADGIPS, organized an Industrial Visit to Mother Dairy, Patparganj for B.Tech (CS) students to bridge the gap between theoretical learning and real-world industrial practices. The visit aimed to provide first-hand exposure to industrial automation, quality control systems, and digital monitoring technologies used in modern food processing industries.

Highlights of the Visit

- Guided tour of fully automated milk processing and packaging units
- Demonstration of PLC-based real-time monitoring and control systems
- Insights into cold chain logistics, energy optimization, and waste management
- Interaction with plant engineers on data handling, system supervision, and safety protocols

Outcome

The industrial visit proved to be a highly enriching experience, strengthening students' understanding of industry-academia linkage. It highlighted the crucial role of computer science in modern industrial automation, process intelligence, and digital transformation, inspiring students to explore careers in Industrial Computing, IoT, and Data Analytics.

🏆 ACHIEVEMENTS

Participation at Microsoft – Clash of Codes v2.0

Kanishka Sharma (3rd Year) participated in the national-level Clash of Codes v2.0 Hackathon at Microsoft Office, shortlisted among top teams for the offline round.

CORE CONNECT Global Buildathon (Microsoft × Core DAO)

Students Ish Malik, Kanishka Sharma, Love Maggo & Dakshyani Murari actively participated in the CORE CONNECT Global Buildathon IRL Meetup, gaining exposure to Blockchain, Web3, AI, and DeFi technologies.

Rank 1 – Bharatiya Antariksh Hackathon (ISRO) 2025 🥇

Team BUGTRIO comprising Arpit Chaudhary & Deepesh Ahlawat secured All-India Rank 1 at the ISRO-organized Bharatiya Antariksh Hackathon 2025, achieving national recognition in space-tech innovation.

Finalists – Google Gen AI Exchange Hackathon 2025

Team members Palak, Nitya, Ish & Love qualified for the Grand Finale of the Google Gen AI Exchange Hackathon at The Leela Palace, Bangalore, presenting their Generative-AI based mental health product "Clario".

🏆 ACHIEVEMENTS

🌍 International Recognition – NASA Space Apps Challenge

Priyanshu Jha (5th Semester)
Finalist at NASA Space Apps Challenge.
Developed an Exoplanet Detection
System using NASA datasets.

🥇 National Hackathon Excellence

Dhruv Singhal & Tushar Kumar Singh
(5th Semester)
Multiple podium finishes in national
hackathons.
Winner – HackQuanta, top ranks at
HackHaven & DevGathering.

💻 Consistent Inter-College Hackathon Performance

Raghav Bhardwaj (3rd Semester)
Finalist at Hack Genesis '25, Code
Kshetra 2.0 & Live The Code 3.0.
Demonstrated strong problem-solving
skills.

🎯 Leadership in Large-Scale Hackathon

Vidhi Garg (5th Semester)
Lead Organizer – CodeVeda Hackathon.
Managed 6500+ nationwide registrations
at Microsoft Office, Gurugram.
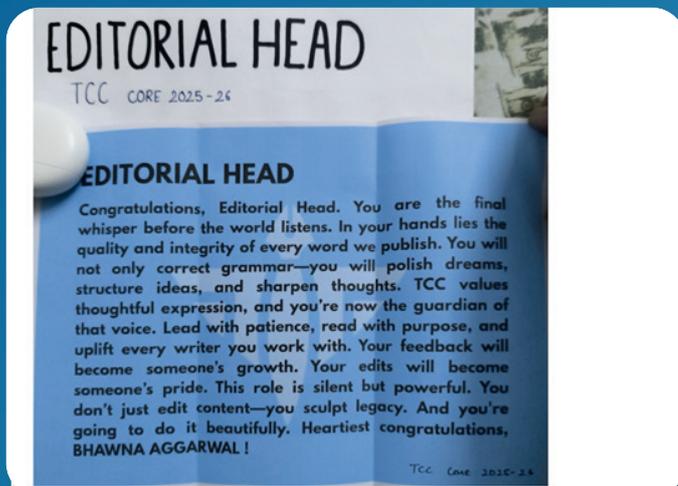
🏆 ACHIEVEMENTS

🤖 Industry Exposure & Emerging Skills

Yash Sharma (5th Semester)
Completed IBM Generative AI Training.
Developed a chatbot using Generative AI concepts.

👨‍💻 Skill Development through Internship

Ashok Joshi (5th Semester)
Completed Web Development Internship at Prodigy Infotech.
Gained hands-on industry experience.

✍️ Editorial & Cultural Excellence

Bhawna Aggarwal (3rd Semester)
Editorial Head – TCC Society.
Key contributor to IEEE Technorax & UTKARSH Fest.

🌟 Technical & Society Leadership

Siddhi Sharma (3rd Semester)
PR Head – AAIRO (AI Society).
Finalist – NexHack Hackathon; active event organizer.

ARTICLES

AGRICULTURAL AUTOMATION
How AI and IoT are transforming farming

Keshav Sharma

Overview

The world's population is growing rapidly and is expected to reach 10 billion by 2050. Feeding this population while coping with climate change is one of the biggest challenges for the agriculture sector. In countries where expanding cropland is impossible, agricultural automation powered by Artificial Intelligence (AI) and the Internet of Things (IoT) has become the most effective solution.

WHY NEEDED?

Modern farming faces several challenges:
- Labor shortages due to workforce migration
- Climate change and extreme weather conditions
- Limited arable land and declining soil fertility
- Increasing food demand

Traditional solutions like expanding farmland are often not possible. Digital technologies provide an alternative: applying water, fertilizers, and pesticides precisely and efficiently, reducing waste and environmental damage. This approach is known as precision farming.

TRAJECTORY

Despite its benefits, agricultural automation faces:
- High initial investment costs
- Maintenance of sensors and machinery
- Technical skill requirements for farmers

However, AI and IoT are moving from conceptual stages to practical implementation. In the future, farms could be fully connected, data-driven, and self-optimizing, helping the agriculture sector meet global food demands sustainably.

LOOKIN AHEAD

By integrating AI and IoT, agricultural automation is paving the way for smarter farming and a more secure food future.

THE UPSIDE

- Increased productivity and efficiency
- Reduced labor dependency
- Lower input costs and wastage
- Sustainable farming practices
- Real-time monitoring and data-driven decisions

In countries like India, automation not only improves productivity but also reduces drudgery, allowing women and other workers to contribute more effectively.

**Nitya Jamdagni**
01215616123

Quantum Computing: Redefining the Future of Technology

Computing Beyond Classical Limits

Quantum computing is one of the most exciting advancements in modern technology. Unlike traditional computers that use bits (0s and 1s), quantum computers use qubits, which can exist in multiple states at the same time. This unique feature allows quantum computers to perform complex calculations much faster than classical machines. The principles of superposition and entanglement give quantum computing its extraordinary power.

Quantum computing has the potential to transform fields such as medicine, cybersecurity, artificial intelligence, and climate research. It can help in drug discovery, improve data security, and solve complex optimization problems. However, the technology is still in its early stages. Qubits are highly sensitive, difficult to maintain, and expensive to develop, which limits large-scale usage at present.

Despite these challenges, leading technology companies and researchers continue to make rapid progress. In the future, quantum computers are expected to work alongside classical computers to solve problems once thought impossible. Quantum computing, though still evolving, represents a major step toward the future of science and technology.
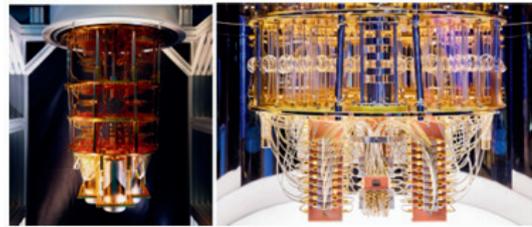
Palak Mishra
04415616123

Model Context Protocol: Unifying AI and Data Systems
Revolutionizing Developer Workflows Through Standardized Interfaces

The Model Context Protocol (MCP) is transforming the landscape of artificial intelligence by solving the most persistent problem in software development: connectivity. Traditional methods of connecting AI models to data sources often rely on custom, brittle "glue code," which can be time-consuming and prone to breaking. MCP is changing this by creating a universal open standard that allows Large Language Models (LLMs) to connect to data safely and efficiently.

This protocol essentially functions like a "USB-C port" for AI applications, allowing them to interface with diverse data sources such as local files, databases, and business tools like Slack or GitHub. By establishing a shared language between the model and the system, developers no longer need to build specific integrations for every single tool. This standardized approach accelerates the building process and ensures that AI assistants have the real-time context required to give relevant answers.

Smart connectivity is a major advancement where MCP enables AI agents to take action rather than just chat. For instance, an AI tool in a code editor can now read a repository's structure or query a database directly to suggest accurate code changes. Rather than operating in isolation, MCP acts as a reliable bridge, ensuring the AI understands the user's specific environment without "hallucinating" incorrect information.

Despite its benefits, security considerations such as data access permissions and user control must be carefully managed. With a focus on open-source collaboration and secure implementation, MCP has the potential to move us from simple chatbots to fully integrated AI systems, ultimately making our digital workflows significantly smarter and more efficient.

Agentic Artificial Intelligence: Redefining Decision Making and Collaboration in the Modern Digital World

How goal driven AI systems are transforming the way technology thinks, acts, and works alongside humans.

Agentic AI marks an important evolution in artificial intelligence, shifting systems from being purely reactive to becoming goal driven and autonomous. Unlike traditional AI that waits for instructions, Agentic AI can understand an objective, break it into smaller tasks, make decisions, and take actions using tools or data with minimal human involvement. This ability to plan and adapt makes it especially relevant in today's fast moving digital environment.

In practice, Agentic AI is already transforming areas such as software development, business operations, research, and personal productivity. It can automate complex workflows, assist developers throughout the development lifecycle, analyze information at scale, and help individuals manage time, learning, or finances more effectively. By handling repetitive and multistep tasks, it allows humans to focus on higher level thinking, creativity, and strategy.

At the same time, the growing autonomy of Agentic AI brings important challenges. Issues related to trust, transparency, accountability, and ethical decision making must be carefully addressed to prevent misuse or unintended consequences. With clear boundaries, human oversight, and responsible design, Agentic AI has the potential to become a powerful collaborator rather than a risk. Overall, it represents a practical and meaningful step toward smarter, more adaptive systems that are already shaping today's world.

AGENTIC AI

What is agentic AI?

ARTICLES
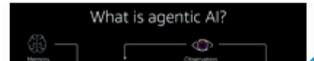
QUANTUM COMPUTING

Khushi Minotra

Overview

As digital technology advances, classical computers are reaching their physical and performance limits. Problems such as complex molecular simulations, large-scale optimization, and cryptographic analysis require enormous computational power that traditional systems struggle to deliver. Quantum computing emerges as a revolutionary technology that promises to solve such problems by harnessing the principles of quantum mechanics.

WHY NEEDED?

Certain real-world problems

grow exponentially complexas their size increases. Classical computers require years—or even centuries—to solve them. Quantum computing offers a way to:
Solve complex problems faster
Model natural systems more accurately
Break current cryptographic methods
Enable discoveries beyond classical limits
This makes quantum computing a critical technology for the future.

OUTLOOK

Despite technical challenges, quantum computing is steadily moving from theory to experimentation and early applications. Advances in hardware stability, error correction, and quantum algorithms are paving the way toward practical and scalable quantum systems.
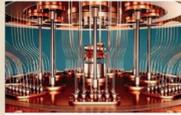
THE ROAD AHEAD

Quantum computing represents a fundamental shift in how computation is performed. Although it is not yet ready to replace classical computers, its potential to solve previously unsolvable problems makes it one of the most promising emerging technologies. As research progresses, quantum computing is set to play a crucial role in shaping the future of science, technology, and industry.

CURRENT STATE

Quantum computing is still in its early development stage. Current systems, known as Noisy Intermediate-Scale Quantum (NISQ) computers, are limited by:
- Short qubit lifetimes
- High error rates
- Scalability challenges

However, major technology companies and research institutions are making rapid progress.

Digital Twin Technology: Bridging the Physical and Digital World
- Katyayni

In today's rapidly evolving technological landscape the boundary between the physical and digital world is becoming increasingly thin. One of the most remarkable innovations driving this transformation is Digital Twin Technology. A digital twin is a virtual replica of a physical object, system or process. This technology enables real-time monitoring, analysis and optimization of physical entities by reflecting them accurately in the digital environment. A digital twin is not just a static model or simulation. Unlike traditional computer models it continuously receives data from sensors embedded in the physical object. This real-time data helps the digital version behave exactly like its real-world counterpart. Any change in the physical system such as temperature, pressure, speed or performance is instantly mirrored in its digital twin. The concept of digital twins was first introduced in the manufacturing and aerospace industries. For example: aircraft engines are equipped with thousands of sensors that collect data during flight. This data is transmitted to digital twins on the ground allowing engineers to monitor engine performance, predict failures and plan maintenance before actual breakdowns occur. This predictive approach not only improves safety but also significantly reduces operational costs. One of the major advantages of digital twin technology is predictive maintenance. Digital twins enable organizations to identify potential problems in advance. By analyzing performance patterns engineers can predict when a component is likely to fail and take preventive action. This increases efficiency, reduces downtime and extends the lifespan of equipment. Beyond manufacturing digital twin technology is finding applications in various domains. In smart cities digital twins are used to create virtual models of entire urban environments. These models help city planners analyze traffic flow, energy consumption, water management and pollution levels. In the healthcare sector digital twins are emerging as a revolutionary tool. Researchers are working on creating digital twins of human organs to study diseases and test treatment methods. Another important contribution of digital twin technology lies in sustainability. By optimizing resource usage and minimizing waste, organizations can significantly reduce their environmental impact. Despite its numerous advantages, digital twin technology does face certain challenges. The implementation requires high-quality sensors, reliable data transmission, strong cybersecurity measures and substantial computing power. Data privacy and system integration also remain key concerns. However with advancements in cloud computing, Internet of Things (IoT) and data analytics these challenges are gradually being addressed. As industries continue to embrace digital transformation digital twins are

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Tanmay Jain
Artificial Intelligence in the Indian Defence Sector

The Government of India is actively integrating **Artificial Intelligence (AI)** into the **defence sector** to enhance **national security**, improve **operational efficiency**, and modernize **military infrastructure**. AI is being deployed as a *decision-support technology* to assist commanders, reduce response time, and minimize risks in complex defence operations.

A major application of AI in defence is **surveillance and threat detection**. AI-based systems analyze data from drones, satellites, radars, and ground sensors through **real-time analysis** to identify unusual activities. This significantly improves **situational awareness** along borders and sensitive regions, enabling faster and more accurate responses to potential threats.

The **Defence Research and Development Organisation (DRDO)** plays a key role in developing **indigenous AI technologies** for defence use, including **image and pattern recognition systems**, **autonomous aerial and ground vehicles**, and AI-assisted **command and control systems**. These technologies reduce dependence on continuous human monitoring while improving operational accuracy and effectiveness.

AI is also applied in **defence logistics and maintenance** through **predictive maintenance** systems powered by **machine learning algorithms**. These systems forecast equipment failures in advance, reducing downtime and enhancing the **operational readiness** of the armed forces.

Through initiatives such as **Innovations for Defence Excellence (iDEX)**, the government encourages innovation by startups and academic institutions, aligning with the **Aatmanirbhar Bharat** vision. Overall, the adoption of AI in the Indian defence sector is driving **technological advancement** and strengthening **national defence capabilities**.

AI in Healthcare: Disease Prediction and Smart Diagnosis

Transforming Modern Medicine Through Intelligent Technology

Artificial Intelligence (AI) is transforming the healthcare industry by improving the speed, accuracy, and efficiency of medical services. Traditional diagnosis methods often depend on manual analysis, which can be time-consuming and prone to human error. AI-powered systems are changing this by enabling early disease prediction and smart diagnostic support.

Disease prediction uses machine learning algorithms to analyze patient data such as medical history, lab reports, and lifestyle patterns. By identifying early warning signs, AI helps doctors take preventive measures before conditions become severe. This proactive approach improves patient outcomes and reduces healthcare costs.

Smart diagnosis is another major advancement where AI assists in analyzing medical images like X-rays, MRI scans, and CT scans. Deep learning models can detect abnormalities with high precision, supporting doctors in making faster and more accurate clinical decisions. Rather than replacing healthcare professionals, AI acts as a powerful decision-support tool.

Despite its benefits, ethical concerns such as data privacy, transparency, and bias must be carefully addressed. With responsible development and proper regulations, AI has the potential to create a smarter, more accessible, and more efficient healthcare system, ultimately improving the quality of life for millions of people.

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