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DEPARTMENT OF INFORMATION TECHNOLOGY

IT INSIGHTS

Where Information Meets Illumination...

Voice of the Department of Information Technology (FIEM)

Prof. Prasenjit Basu

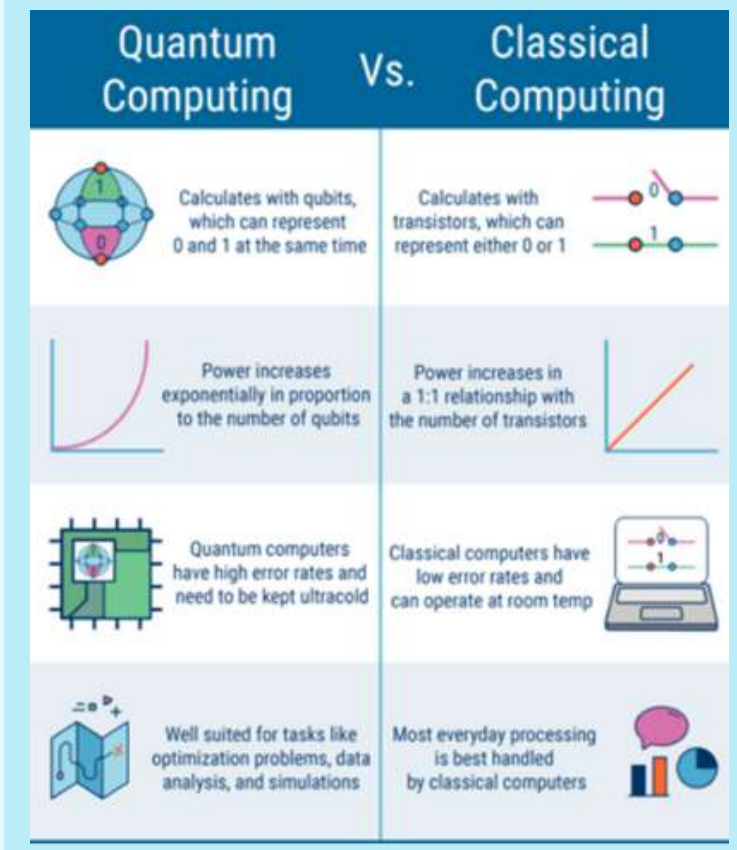
"At *Future Institute of Engineering and Management*, the Department of *Information Technology* views technology as the backbone of modern progress and responsible development. For B.Tech students, it represents a continuous journey of learning that encourages analytical thinking, originality, and the ability to translate ideas into practical solutions. Through structured learning and hands-on exposure, students gain the confidence to build impactful systems, adapt to evolving industry demands, and assume leadership roles in a technology-driven society. Engagement with contemporary areas such as *Artificial Intelligence, Cybersecurity, Cloud Computing, and Data Science* prepares them to solve complex societal and industrial problems while contributing to sustainability. The advancement of technological knowledge not only strengthens individual careers but also supports the nation's growth by driving innovation, enhancing efficiency, and enabling inclusive and globally relevant development."

-Prof. Prasenjit Basu
Assistant Professor
Department of Information Technology

Classical Algorithms in the Era of Quantum and AI Computing

Classical algorithms, based on traditional computing models that process data as sequences of binary decisions (0s and 1s), remain the backbone of modern computer science. From everyday tasks like sorting and searching to complex applications such as machine learning and big data analytics, classical algorithms are proven, reliable, and highly optimized. They are deterministic, meaning that for a given input these algorithms produce the same result every time, a property that makes them essential for critical systems like network routing, databases, and real time applications.

In artificial intelligence today, most core methods such as gradient descent for optimizing neural networks are classical. These algorithms efficiently navigate complex problem spaces despite challenges like local optima, where a solution may seem best locally but not globally. Classical methods scale with hardware improvements and parallel computing, enabling data-intensive tasks in healthcare, finance, and autonomous systems.



At the same time, quantum computing has recently demonstrated remarkable milestones. For example, a quantum algorithm known as *Quantum Echoes* ran on Google's 105-qubit Willow processor and achieved computation around **13,000 times faster** than the best classical supercomputers for a specific scientific simulation task. This breakthrough highlights quantum computing's potential in specialized areas such as molecular modelling, materials science, and drug discovery fields where classical models struggle due to exponential complexity.

However, practical, general purpose quantum computers remain limited by factors such as qubit stability and error correction. Today's quantum systems are still far from replacing classical systems across broad domains, and experts predict that *hybrid classical quantum approaches*, where classical algorithms handle large scale everyday computing and quantum components tackle specific bottlenecks will dominate for years to come.

- **Classical vs Quantum Computing: Workflow Comparison**

Step	Classical Computing	Quantum Computing
Problem definition	Define problem	Define problem
Algorithm/Design	C/C++/Java algorithms	Parametric quantum algorithm & circuit
Compilation	Standard compiler	Quantum compiler & classical optimizer
Execution	Run on classical hardware	Run on quantum processor (probabilistic)
Output	Deterministic binary outputs	Probabilistic outputs; evaluate cost & iterate
Solution	Direct solution	Converged parameters give solution

Key Differences:

- Classical algorithms produce **deterministic outputs**, whereas quantum algorithms are **probabilistic** and require iterative evaluation.
- Hybrid approaches often use classical optimization routines to adjust parameters in quantum circuits, combining classical reliability with quantum advantages.

In conclusion, while quantum computing introduces exciting possibilities, classical algorithms continue to power the vast majority of computing tasks in industry and research. Their maturity, efficiency, and adaptability ensure they remain central to technological innovation, particularly when enhanced with AI and hybrid techniques.

-Prof. Ishani Das
Assistant Professor
Department of Information Technology

ATAL FDP on Healthcare and MedTech: AI and Applications

An *ATAL Faculty Development Program (FDP)* on the domain *"Healthcare and MedTech: AI and Applications"* was successfully organized by *Future Institute of Engineering and Management (FIEM)* from *10th to 15th November 2025* . The program was conducted during the evening hours from *6:00 PM to 9:00 PM*, enabling active participation from faculty members alongside their academic responsibilities.

The FDP focused on emerging applications of Artificial Intelligence in healthcare and medical technologies, covering contemporary tools, methodologies, and real-world use cases. Resource persons shared valuable insights on AI-driven diagnostics, healthcare data analysis, and technological innovations in the MedTech sector. *Dr. Prosenjit Mukherjee, Prof. Prasenjit Basu, and Prof. Subhasis Mitra* from the *IT Department* actively participated in the program, benefiting from the interactive sessions and hands-on discussions. The FDP concluded successfully, significantly enhancing the academic and professional expertise of all participants.

Workshop on Hands-On AI Engineering with Python Libraries

The Department of Information Technology successfully organized a workshop titled *"Hands-On AI Engineering with Python Libraries"* for all *2nd Year IT students.* The workshop was conducted by eminent industry resource persons from *Ardent Computech Pvt. Ltd.* and took place over two days, commencing on *21st November 2025 at 2:00 PM* and concluding on *22nd November 2025 at 11:59 PM.* The sessions focused on providing practical exposure to advanced and trending technologies used in modern AI applications, enabling students to enhance their skills for academic projects, industry readiness, and campus interviews. Students actively participated in the hands-on sessions by bringing their own laptops and using an active internet connection, which made the workshop interactive and highly beneficial.

Fig : Glimpses from the "Hands-On AI Engineering with Python Libraries" workshop

Cultural Excellence by IT Student

Ms. Esha Dalal from the Department of IT delivered an outstanding performance at *NATYASHREE*, captivating the audience with her grace and expressive stage presence. Her elegant blend of rhythm and tradition earned her the ***First Position***, bringing pride to the Department and reflecting the institution's support for cultural excellence. Her achievement stands as an inspiration to fellow students to pursue excellence beyond academics.

Fig : Performance Glimpse

IT Students Shine at NSSC '25, IIT Kharagpur

Sukanya Acharya and *Debjit Kanjilal (IT 3rd year)*, along with *Disha Dutta and Moinak Sarkar (IT 2nd year)*, achieved a significant milestone by qualifying as a team for the *National Students' Space Challenge (NSSC '25)*, a prestigious national-level event held at *IIT Kharagpur* from *7th to 9th November 2025*. Their selection reflects strong technical knowledge, teamwork, and problem-solving abilities. The team showcased remarkable versatility by qualifying in multiple events: Extravaganza, Lift-Off, Paper Presentation, and Pitch the Cosmos; demonstrating innovation, analytical thinking, and effective communication while representing the department with distinction on a national platform.Their achievement stands as a testament to the department's emphasis on academic excellence, collaborative learning, and active participation in nationally competitive technical forums.

Fig : A Glimpse of NSSC '25 Participation

Adding to the team's success, *Disha Dutta (IT 2nd year)* delivered an outstanding individual performance by securing ***First position*** in the Space Art event under the theme *"Celestial Strokes"*. Her artwork was widely appreciated for its originality, conceptual clarity, and seamless fusion of scientific ideas with artistic expression. This achievement not only brought her individual recognition but also highlighted the department's emphasis on interdisciplinary excellence and holistic student development.

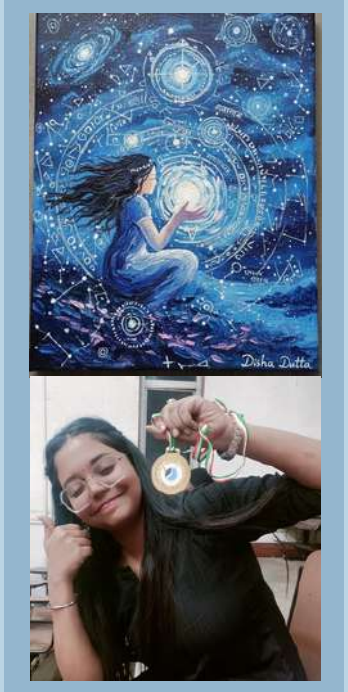


Fig : Disha Dutta (IT 2nd year) with her award-winning artwork and medal after securing First Position in the Space Art event at NSSC '25, IIT Kharagpur"

Alumni Excellence Talk on "Challenges in Workplace and Real-Life Workflow"

The Department of Information Technology successfully organized an Alumni Excellence Felicitation and Talk titled *"Challenges in Workplace and Real-Life Workflow"* for all *2nd-year students on 25th November 2025 at Lab 9, FIEM.* The session was conducted from *3:30 PM to 5:30 PM* and aimed to provide students with valuable insights into professional challenges and real-life work processes.

The department was honored to welcome *Mr. Arka Gayan,* a distinguished alumnus and *Associate at CTS,* with six years of experience in real-life project execution. He shared his professional journey, discussed industry expectations, and highlighted practical challenges faced in the workplace. His interaction with the students was highly engaging and motivational, offering practical guidance for career development and industry readiness. The session concluded successfully, leaving students inspired and better informed about real-world professional workflows.

45th West Bengal State Road Cycling Championship

The *45th West Bengal State Road Cycling Championship*, organized by the *West Bengal Cyclists' Association* under the aegis of the Cycling Federation of India , was successfully conducted on *15th and 16th November 2025 at Muragacha Madanpur.*

As the biggest competitive cycling event in West Bengal, the championship marked its 45th edition and featured two days of intense road racing along with active community participation. Among the participants was *Mr. Tushar Sharma*, a *first-year student* of the Department of *Information Technology*, whose participation added pride to the institution. The event showcased remarkable sportsmanship, endurance, and competitive spirit, further strengthening the culture of competitive cycling in the state.

Fig 1: A moment from the 45th West Bengal State Road Cycling Championship featuring participant Mr. Tushar Sharma.

Fig 2: Poster of the 45th West Bengal State Road Cycling Championship, November 2025.

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The Department of Information Technology informs that 3rd and 4th year students will be appearing for their semester final examinations, scheduled to commence from 26th November, as part of the ongoing academic calendar.

Thanks for Reading...

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