DEPARTMENT OF COMPUTER SCIENCE AND TECHNOLOGY

THE LOOP

A bi-annual Newsletter

April - September, 2024

HIGHLIGHT

HOD SPEAKS

Dear All,
I am delighted to welcome you to the inaugural edition of the newsletter, “THE LOOP”, brought to you by the Department of Computer Science and Technology (CST)! This platform is envisioned to celebrate our accomplishments, share innovations, and foster collaboration within our dynamic and ever- evolving community.

The Department of Computer Science and Technology at IIEST, SHIBPUR has a rich legacy of excellence and innovation since its inception. Over the years, it has grown to become a hub of cutting- edge research, rigorous academic programs, and impactful industry collaborations. The department offers Undergraduate, Dual Degree, Postgraduate, and Doctoral programs across diverse domains, including Artificial Intelligence, Machine Learning, Data Science, Cybersecurity, Distributed Systems, and Software Engineering.

Our department has consistently contributed to the advancement of technology on a global scale. It has shaped numerous pioneers in academia, research, and the tech industry, who have gone on to make significant contributions worldwide. With a commitment to fostering creativity, innovation, and interdisciplinary research, the department continues to uphold its tradition of excellence in education and world-class research.

In this edition, you will discover updates on research breakthroughs, student achievements, industry tie-ups, highlights from recent conferences, and upcoming events. We also aim to showcase
opportunities for collaboration and innovation to strengthen the bonds within our vibrant CST community.
Let us embrace this newsletter as a collective voice to celebrate our journey, share our stories, and inspire one another. I look forward to your contributions and insights as we take the Department of Computer
Science and Technology to even greater heights.
Best regards,

Prof. Apurba Sarkar
Head of Department
Department of Computer Science and Technology

REPORT 2024

Department of Computer Science and Technology

The Department of Computer Science and Technology (CST) was established in 1982. Since its inception the department has played an important role in developing a vibrant and forward-looking academic environment. The department always maintains state- of-the-art infrastructure and facilities for advanced research and consultancy. It was accredited by the National Board of Accreditation (NBA) as 'A' grade and received ISO 9000 certification in 1999-2000. The department was also honoured as the DST-FIST sponsored department in 2004

Some of the thrust areas identified by the department are Machine learning including Deep Neural Networks and Soft Computing techniques, Generative Adversarial Networks, Internet Of Things, Wireless Sensor Network, Mobile Computing, Cryptanalysis Techniques, Image, Text, Audio and Video Processing including Medical Image Analysis, Code Mixed Bilingual Language Processing, Low Resource Real Time Image Processing and Sequence Tagging, Managing Uncertainty in Primary Healthcare.

Further, the department also conducts advanced research on Interconnection Network, Mixed Signal Design and Testing, Text Mining in Diverse Social Media Data Analysis, Theory and Applications of Cellular Automata in Diverse Fields, Synthesis and Testing of Reversible Circuit, Digital Micro Fluidic Bio Chip and Nano-Biochip, Pattern Recognition, and Bio Informatics.

Department At a Glance

Number of Faculty members (including contractual/ temporary/ visiting)	15	
Sanctioned student strength in the UG,PG (per Batch Intake) and PhD courses :	UG	90
	PG	22
	PhD	No such fixed intake

Major research area :

The department specializes in various areas such as

- **Machine learning**, focusing on **deep neural networks** and **soft computing**, as well as **generative adversarial networks**.
- It explores the **Internet of Things** and **wireless sensor networks**, **mobile computing**, and **cryptanalysis**.
- Additionally, it emphasizes **media processing** across multiple formats, particularly in **medical image analysis**, and **addresses code-mixed bilingual language processing**.
- The team also works on **low-resource real-time image processing**, managing uncertainty in primary healthcare, and conducts advanced research in **interconnection networks**, **text mining**, **cellular automata**, and **bioinformatics**, including the **synthesis of reversible circuits** and **digital microfluidic biochips**.

No. of publications of faculty members (Journal/Conference/Book/Book Chapter) :

- Journal = 12
- Conference = 10
- Books = 02

Total : 24

Name of Sponsored research projects :

- Exploring Cellular Automata Model for Hardware Security ; SPARC, Govt of India ; Co-PI: Biplab K. Sikdar
- Design and Implementation of Pipeline Architecture for DNA Sequence Alignment ; Department of Bio- Technology (DBT), Ministry of Science and Technology, Govt. of India ; PI: Surajeet Ghosh
- Design and Implementation of a Comparison-Free Scalable High-Throughput Energy- Efficient Hardware Sorting Engine for FPGA-Based Embedded System Applications ; Department of Higher Education, Science & Technology and Biotechnolog y, Govt. of West Bengal ; PI: Surajeet Ghosh
- QoS Issues in Mobile Computing ; AICTE ; PI: Sulata Mitra
- Moving base INS alignment using minimum manoeuvre ; DRDO ; PI: Abhikik Mukherjee
- Conceptual design of NGC loop for airborne missiles ; DRDO ; PI: Abhikik Mukherjee
- Cellular Automata Based Document Compression Technology ; AICTE ; PI: Biplab K. Sikdar

List of Publications of Research Scholars

1. Paul, J., Das Chatterjee, A., Misra, D., Majumder, S., Rana, S., Gain, M., De, A., Mallick, S. and Sil, J., A Survey and Comparative Study on Negative Sentiment Analysis in Social Media Data: A Deep Learning Framework for Classifying and Mitigating Bias in News Reporting. Multimedia Tools and Applications, Springer US, 2024.

2. Mitra, S. K., An Enhanced Network Density-Based Centrality for Influential Node Detection in Complex Networks. In IEEE TENCON 2024. IEEE, 2024 September 10.

3. Dey, D. and Ghosh, N., iTRPL: An Intelligent and Trusted RPL Protocol Based on Multi-Agent Reinforcement Learning. Ad Hoc Networks, Elsevier, 2024.

Students Achievement

- One student achieved a rank of AIR 67 in Gate CSE.
- 20 students with 20+ LPA package and 6 students with >35 LPA package
- One student (Ananya Sutradhar) got IndiaAI Fellowship

Tech-Talks

- **Atrayee Samanta (GSOC)**

The first episode featured Atrayee Samanta discussing her journey in open-source development, with a focus on Google Summer of Code (GSoC) and Outreachy. Starting with inspiration from a NASA-related project, the guest has contributed to full-stack projects using React and C++.
Key insights included the value of early preparation, understanding the codebase, and the importance of mentor communication. The open-source community's supportive nature was highlighted as a major advantage over other tech platforms.
Success in programs like GSoC requires:

- Strong technical and personal preparation
- Continuous contribution and learning
- Early involvement (ideally from December/January)
- Active engagement on platforms like GitHub, Reddit, and Stack Overflow

Overall, open-source participation enhances both technical skills and professional growth through real-world collaboration and innovation.

ENCYPTIFY

Encryptify is ASCE's dedicated cybersecurity workshop series designed to spark curiosity and build foundational awareness in the field of cyber defense and ethical hacking. The initiative featured both offline and online sessions tailored for beginners and enthusiasts alike.

The offline session introduced participants to the exciting world of Capture the Flag (CTF) competitions—offering hands-on experience in solving real-world cyber puzzles. Complementing this was an online session conducted under our Cyber series, where participants explored broader cybersecurity concepts in a structured, interactive format.

Encryptify aimed to cultivate cyber awareness, encourage responsible digital behavior, and empower students to navigate and contribute to the evolving landscape of cybersecurity in today's interconnected world.

CodeSprint

CodeSprint is a weekly initiative by ASCE focused on enhancing students' skills in Data Structures, Algorithms (DSA), and Competitive Programming. Each session was designed around a specific topic or problem type, with structured practice sheets and curated question sets provided in advance. Participants engaged in hands-on problem-solving followed by interactive discussions that deepened understanding and built confidence.

In addition to topic-based sessions, CodeSprint also featured discussion rounds for questions from recent competitive programming contests—helping students analyze real-world problems, optimize solutions, and learn from varied approaches. The initiative fostered a consistent and collaborative learning environment for aspiring programmers

CodeSprint aimed to foster a consistent, disciplined approach to coding—helping students sharpen their logic, speed, and problem-solving techniques week by week.

Alumni Corner

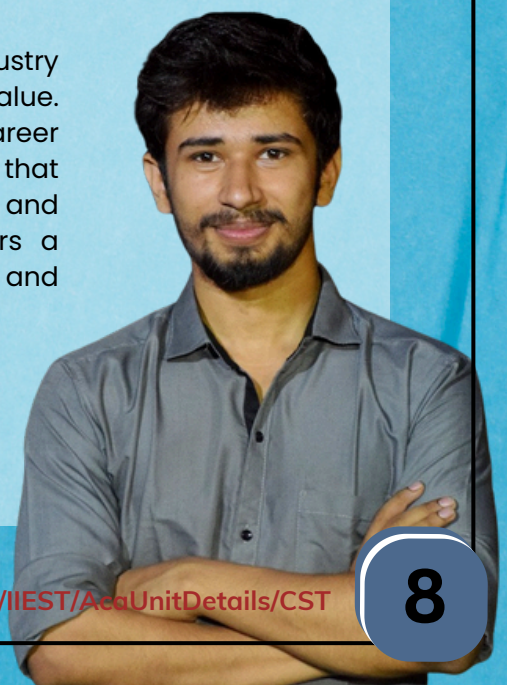
Life After B.Tech in Computer Science: Exploring Exciting Options

Completing your B.Tech in Computer Science is a significant milestone, marking the beginning of a thrilling journey. As you consider your next steps, you're likely wondering which path to take. One option is to dive into the industry, applying your theoretical knowledge to real-world problems and gaining practical experience. This approach allows you to start earning a salary, build connections, and develop a sense of financial stability. Moreover, working in the industry can help you identify areas that genuinely interest you, making it easier to specialize or pursue further education in the future. Another attractive option is preparing for the GATE (Graduate Aptitude Test in Engineering) exam. A good GATE score can open doors to prestigious institutes for M.Tech or MS programs, as well as research positions or assistantships. This route can significantly enhance your career prospects, particularly in research and development, and provide a strong foundation for specialized knowledge. Additionally, GATE preparation can help you develop a deeper understanding of your field, making you a more competitive candidate in the job market.

If you're interested in management, consulting, or entrepreneurship, considering an MBA (Master of Business Administration) might be an excellent choice. An MBA program can equip you with essential management skills, facilitate career transitions, and provide valuable networking opportunities. This path can help you develop a holistic understanding of business operations, enabling you to make informed decisions and drive growth in your organization. Moreover, an MBA can significantly increase your salary range, with average salaries ranging from 15-25 lakhs per annum, compared to 5-10 lakhs per annum for bachelor's degree holders. Additionally, an MBA teaches you people s kills, which are crucial in the market and far more valuable than bookish knowledge. You'll learn how to communicate effectively, lead teams, and build strong relationships, making you a more effective and influential professional.

Pursuing an MBA can have a profound impact on your career, leading to faster promotions, leadership roles, and increased earning potential. The program helps you develop essential skills like communication, leadership, and problem-solving, which are highly valued in the corporate world. By investing in an MBA, you'll not only enhance your career prospects but also become a more confident, capable, and influential professional. Lastly, exploring certifications like CFA (Chartered Financial Analyst) can demonstrate your expertise in a specific domain and enhance your career prospects. Specialized certifications can lead to better job opportunities, higher salaries, and a sense of professional satisfaction. By pursuing certifications, you can stay updated with industry developments, expand your skill set, and increase your market value.

By pursuing certifications, you can stay updated with industry developments, expand your skill set, and increase your market value. Ultimately, the key is to choose an option that aligns with your career goals, financial situation, and personal interests. By selecting a path that resonates with you, you'll be more likely to stay motivated, focused, and committed to achieving success. Remember, each option offers a unique set of benefits, and the right choice can lead to a fulfilling and rewarding career.



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