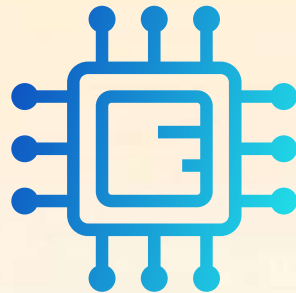




BBDNIIT

Babu Banarasi Das Northern India Institute of Technology



CAMPUS DRONE'24

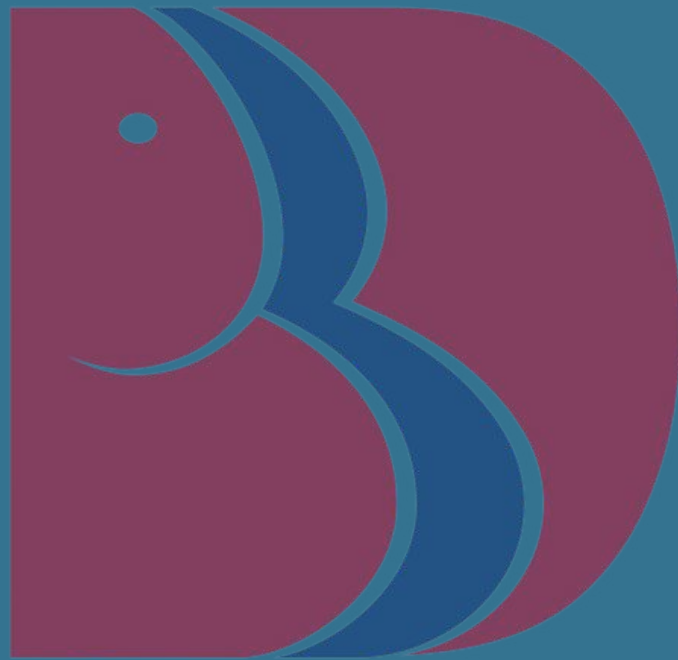
COMPUTER SCIENCE & ENGINEERING DEPARTMENT



Babu Banarasi Das Northern India Institute of Technology

Sector-II, Dr. Akhilesh Das Nagar, Ayodhya Road, Lucknow (U.P.) - 226028, India

Ph.: +91-(522)-6196222/6196223/6196336/Website: www.bbdniit.ac.in/Email: info@bbdniit.ac.in



BBDNIIT

NBA ACCREDITATION



we are proud to say that

Babu Banarasi Das Northern India Institute of Technology

is now Accredited by



for the Second Time
in Two Undergraduate Programs

Computer Science & Engineering Information Technology



What is it?

NBA accreditation is a quality assurance process that evaluates and certifies educational programs, ensuring they meet high standards. It enhances program credibility, student employability, and aligns with global education benchmarks. Accredited programs are recognized nationally and internationally, benefiting both students and institutions.

Lord Ganesha's Grace

वक्रतुण्ड महाकाय , सूर्यकोटि समप्रभ ।
निर्विघ्नं कुरु मे देव , सर्वकार्येषु सर्वदा ॥

The BBD Campus proudly houses a beautiful Ganesh temple, a spiritual haven that infuses the college with a profound sense of serenity and purpose. The temple's presence on campus is more than just a place of worship; it symbolizes a bridge between the academic and the divine, offering students a space to connect with their spirituality amid their educational journey.

Ganesh Ji, the revered remover of obstacles and the harbinger of wisdom and prosperity, holds a special place in Hindu tradition. His temple at BBD Campus stands as a testament to these values, providing students with a sanctuary where they can seek blessings, reflect, and find solace during their studies. The essence of the temple extends beyond its physical structure, permeating the entire campus with a spirit of peace and positivity.

For many students, college life is a time of immense growth, but it also comes with its share of challenges and uncertainties. The Ganesh temple offers a reassuring presence, reminding students that they are not alone in their journey. It encourages them to pause, pray, and draw strength from their faith, fostering a holistic approach to education that nurtures both the mind and the soul. The act of worshiping together also fosters a sense of community, as students from diverse backgrounds come together in shared reverence, strengthening their bonds and promoting a culture of mutual respect and support.

The choice of a Ganesh temple specifically holds deep significance. Lord Ganesh, revered as the deity of beginnings, is invoked at the start of new ventures to ensure success and remove obstacles. For students embarking on their academic journey, seeking Ganesh's blessings can be a source of immense comfort and confidence. His wisdom and benevolence inspire students to pursue their goals with determination and integrity, knowing they have divine support.

Moreover, the Ganesh Ji temple at BBD Campus serves as a reminder of the cultural and spiritual heritage that underpins our education system. It encourages students to value and preserve these traditions, recognizing that true education encompasses not just intellectual growth, but also moral and spiritual development.

Babu Banarasi Das Ji



Late Babu Banarasi Das Ji
(1912 – 1985)
Ex Chief Minister
Govt. of Uttar Pradesh

“To provide an open opportunity to the young generation for evolving their core competencies and to build their career as world class professionals with broad based foundation, in-depth knowledge & versatile personality to meet the challenges of Global Economy...” – Babu ji’s Vision.

Babu Banarasi Das Ji, a born nationalist, in his early youth, joined hands with Mahatma Gandhi & Jawahar Lal Nehru in the movement to free India from the clutches of British rule.

During his long political career, he worked as a Minister, Speaker and Member of Parliament (both Lok Sabha and Rajya Sabha). He also held the position of the Chief Minister of Uttar Pradesh. His entire life was devoted to secure the dignity of individuals through selfless service to mankind. He was a humanitarian who enabled people to realize their goals. He never believed in surrendering to any forces. Even in the face of death, he would not give in. “Man doth not yield himself to angels, not even unto death, utterly, saved, by the weakness of his feeble will.” Babuji always led and inspired people through his own example, leaving behind a legacy for future generations. We are privileged to inherit that legacy and perpetuate his memory.

Dr. Akhilesh Das Gupta Ji



LATE DR. AKHILESH DAS GUPTA
MBA, LLB, Ph.D.
Ex-Member of Parliament (Rajya Sabha)
Hon'ble Founder Chairman, BBD Group

"We not only make technocrats at BBD, we churn out citizens of the world, perfect in all respects, be it leadership, competence, confidence, communication, moral or knowledge..." - Akhilesh Das Gupta's Vision.

A distinguished political leader, philanthropist, educationist and social worker, Dr. Akhilesh Das is the pride of Lucknow city. He has established himself as a worthy son of his illustrious father Late Babu Banarasi Das Ji.

He has obtained MBA, LLB & Ph.D.(Human Resource Management)degrees, Dr. Akhilesh Das decided to follow his father's footprints by choosing Social Service as his primary goal. In his distinguished public life spanning well over three decades, Dr. Das was first elected as the Mayor of Lucknow in year 1993 and became one of the youngest Mayors of the world. Subsequently, he was elected as a Member of Parliament (Rajya Sabha) in November 1996 and was re-elected for a second term in November 2002 till November 2008. Dr. Das has been elected again as a Member of Parliament (Rajya Sabha) for a third consecutive term in 2008 till 2014.

Dr. Das has been a member of many important parliamentary committees and National level apex advisory & statutory bodies including the AIMS. He has been a member of the Executive Committee of AICTE. He had been the Chairman Parliamentary Standing Committee for Industries. He also served with distinction as the Union Minister of State for Steel and made a place for himself as one of the foremost National leaders.

Contribution To Sports

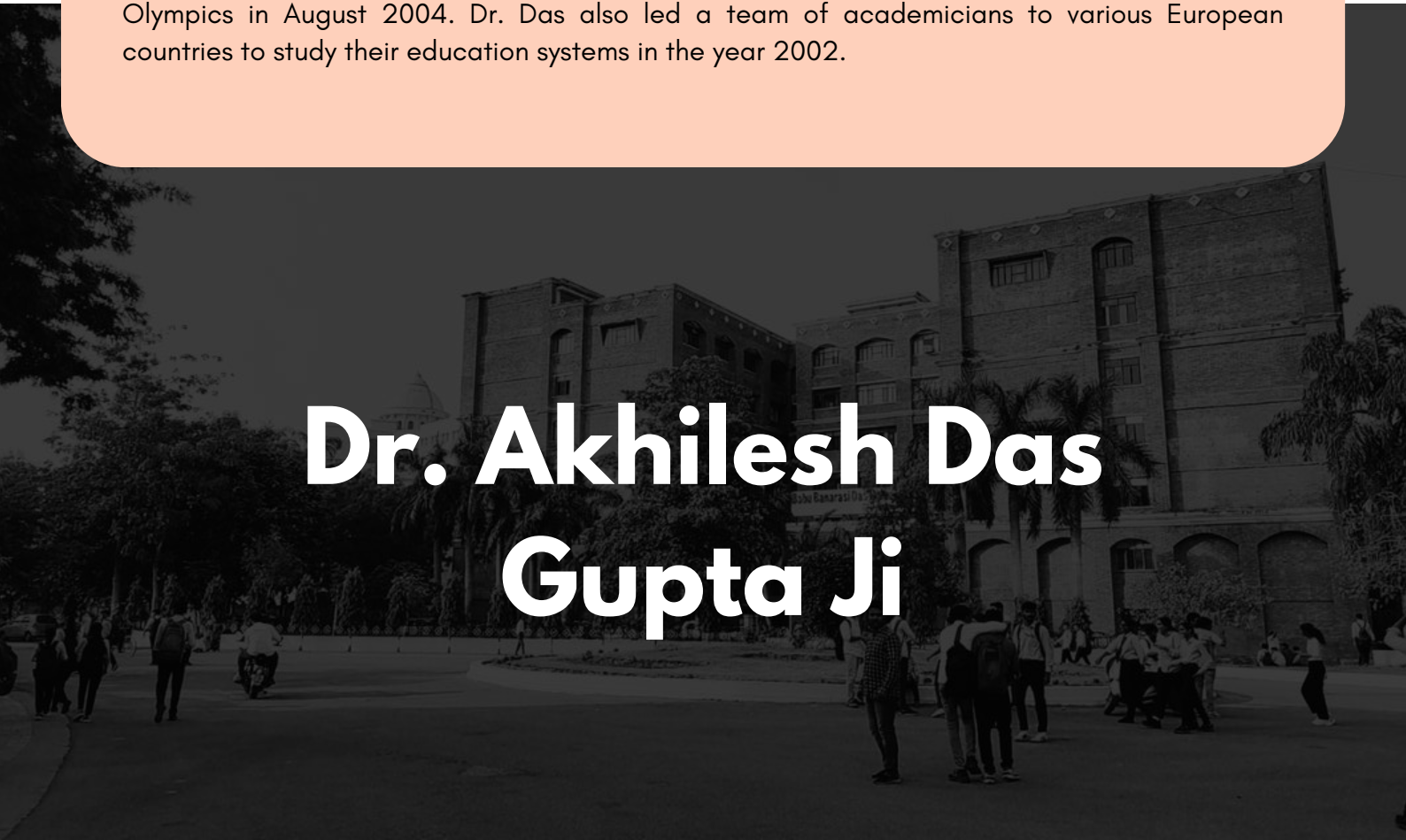
Dr. Akhilesh Das is an enthusiastic sports person. He underwent an exhaustive training in England as a Junior Badminton player. Later, he represented and captained the U.P. State Badminton team for many years and won many National & International tournaments including the National Doubles Championship. His love for other sports is no less. He has been instrumental in organizing and facilitating many National level tournaments in various sports. Presently he is the president of the U.P. Olympic Association & Chairman of Badminton Association of India.

Contribution To The Cause Of Education

As a social thinker, Dr. Das realized the need of Quality Technical & Professional education for the overall growth and upliftment of the masses and development of the State of Uttar Pradesh. Accordingly, Babu Banarasi Das Educational Society (BBDES) was founded through which the torch for higher professional education was lit in Lucknow, the Capital of U.P. The first institution in the series, Babu Banarasi Das National Institute of Technology & Management (BBDNITM) was established in 1998.

Travels And Experiences

He has travelled extensively to U.K., U.S.A., Japan, France, Switzerland, Spain, Portugal, Sau Paulo etc. on several occasions. Dr. Das has attended several World Seminars and Conferences including UNO sponsored Conference of Mayors (Japan) in 1993 and UNCTAD XI Conference (Brazil) in 2004. As the Mayor of Lucknow, he attended the International Children's Game held in Canada in 1994 and led the Indian Badminton Team as its Chef-de-Mission at the Athens Olympics in August 2004. Dr. Das also led a team of academicians to various European countries to study their education systems in the year 2002.



**Dr. Akhilesh Das
Gupta Ji**

Mrs. Alka Das Gupta Ji



MRS. ALKA DAS
M.B.A., L.L.B.
Chairperson, BBD Group

A lady with spirit, determination and zeal, Mrs. Alka Das has been the driving force behind her husband Dr. Akhilesh Das. She is the daughter of Late Justice D. P. Gupta, who held high positions in the State of Rajasthan, as its Governor and Chief Justice. She was brought up on Gandhian ideals and philanthropic traditions.

Mrs. Das is a Management expert and a legal luminary who has a long involvement with issues of social justice and women empowerment in our country. She is a legal consultant to several reputed organizations and an active Social Worker. She is connected with many National Social & Educational Organizations. She is also a Life Member of the "Rajasthan High Court Bar Association". The establishment of Northern India Engineering College, Lucknow was an initiative taken by her to provide quality professional education to match the International Standards.

She has travelled extensively to countries like Denmark, Italy, Japan, France, Switzerland, UK and USA to study the pattern of education and facilities provided to the students there. As a Co-founder of Babu Banarasi Das Group of Educational Institutions, Mrs. Das has made a fertile attempt to nurture a generation of self-made and highly motivated students with an inbuilt commitment to do something constructive for the Country

Mr. Viraj Sagar Das Ji



Mr. Viraj Sagar Das
B.A LL.B (Hons.),
Advocate
President, BBD Group

“Education is the most powerful weapon which you can use to change the world”
– Nelson Mandela

Babu Banarasi Das University has its roots lying deep in quality education practices that equip each student with broad outlooks to prepare them for this futuristic world. We are committed to providing the education that fulfils the needs of today's world. Today, education is not limited to textbook courses and their practical implementation. Education has been through a major transformation where apart from the syllabus, it has become imperative to inculcate some extra skills in the students so that they could truly succeed in their lives. We encourage our students to perform well in their academics and also to take active participation in all the co-curricular activities to develop interpersonal skills, take up challenges, be self-dependent and most importantly, have a good time while learning.

To quote Dr. A.P.J.Abdul Kalam, “Learning gives creativity, creativity leads to thinking, thinking provides knowledge, and knowledge makes you great”.

Director's Message



Prof. (Dr.) V. K. Singh
Director (Engg.), BBDNIIT, Lucknow

Dear Readers,

"One child, one teacher, one book, one pen can change the world." – Malala Yousafzai

It gives me immense pleasure to introduce our Computer Science and Engineering Departmental college magazine at Babu Banarasi Das Northern India Institute of Technology (BBDNIIT), Lucknow. Since its inception, BBDNIIT has been committed to providing quality technical education and developing competent technocrats who are socially sensitive and committed to excellence on a global scale.

For over 17 years, BBDNIIT has stood as a beacon of academic excellence and innovation in the field of engineering. Our esteemed faculty, state-of-the-art infrastructure, and rigorous academic processes are all geared towards nurturing talent and fostering an environment of growth and learning.

In this magazine, you will find a vibrant showcase of the creativity, dedication, and hard work of our students and faculty. It reflects the dynamic and inclusive community we have cultivated, where every student is encouraged to pursue their passions and excel both academically and personally. Our systematic teaching-learning process prepares students for the challenges ahead, equipping them with the knowledge, skills, and ethical values necessary to make significant contributions to society.

The global technology landscape is evolving rapidly, and to remain competitive, our students must be prepared to face new challenges head-on. BBDNIIT is dedicated to training students to meet these challenges with confidence and competence. We continue to strive for excellence in professional education, aiming for new heights and fostering a thinking, professional order.

I encourage all students to make the most of their time with our dedicated faculty and staff, to develop their proficiency, and to grow both personally and professionally. The doors of our faculty members are always open for guidance and support.

With best wishes for your continued success and growth.

HOD's Message



Prof.(Dr.) Anurag Shrivastava
Head of department

Dear Readers,

"The roots of education are bitter, but the fruit is sweet." —Aristotle

It is a matter of pleasure to speak with all of you through this magazine. We all can take pride from the fact that each one of us has contributed to the present day glory and growth of our college.

I am happy to note that various initiatives are taken by the faculty to disseminate knowledge by organizing conferences, training programs and workshops. Expert lectures are also organized by various departments from time to time to keep abreast with the latest developments in the field of science and technology.

For over 17 years, BBDNIIT has stood as a beacon of academic excellence and innovation in the field of engineering. Our esteemed faculty, state-of-the-art infrastructure, and rigorous academic processes are all geared towards nurturing talent and fostering an environment of growth and learning.

In this magazine, you will find a vibrant showcase of the creativity, dedication, and hard work of our students and faculty. It reflects the dynamic and inclusive community we have cultivated, where every student is encouraged to pursue their passions and excel both academically and personally. Our systematic teaching-learning process prepares students for the challenges ahead, equipping them with the knowledge, skills, and ethical values necessary to make significant contributions to society.

The global technology landscape is evolving rapidly, and to remain competitive, our students must be prepared to face new challenges head-on. BBDNIIT is dedicated to training students to meet these challenges with confidence and competence. We continue to strive for excellence in professional education, aiming for new heights and fostering a thinking, professional order.

I encourage all students to make the most of their time with our dedicated faculty and staff, to develop their proficiency, and to grow both personally and professionally. The doors of our faculty members are always open for guidance and support.

With best wishes for your continued success and growth.



Institute Vision

To establish a multi-disciplinary environment with excellence in technical education and research for developing competent professionals who meet the challenges of industrial and societal development with human values and ethics.



Institute Mission

- To provide an excellent environment with supporting infrastructure to prepare globally competent professionals acceptable to industry and society.
- To inculcate a spirit of research, innovation and entrepreneurship by exposing multi-disciplinary approach.
- To motivate aspiring graduates to solve real life problems with zeal of lifelong learning.
- To imbibe a healthy environment which helps to develop intellectual capabilities among graduates to transform them into professionals with human values and ethics.



Department's Vision

To provide a conducive environment for learning and create research opportunities in the field of Computer Science and Engineering to meet global requirements using the latest technologies with ethical values.



Department's Mission

- To provide theoretical and practical concepts across the Computer Science discipline.
- To impart an education that is well suited to meet the challenging software needs of the industry.
- To nurture the undergraduate students with multi-disciplinary and research activities to grow as professionals.
- To empower students with moral and ethical values.

PROGRAMME EDUCATIONAL OBJECTIVES

Program Educational Objectives (PEOs)

- To Encourage students to strengthen their technical capabilities for providing solutions to meet industrial and societal needs.
- To groom graduates as professional engineers to work with leadership and problem solving skills.

Program Outcomes (POs)

- PO1: Engineering knowledge: Apply the knowledge of mathematics, science, engineering fundamentals, and an engineering specialisation to the solution of complex engineering problems.
- PO2: Problem analysis: Identify, formulate, review research literature, and analyse complex engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences, and engineering sciences.
- PO3: Design/development of solutions: Design solutions for complex engineering problems 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.
- PO4: Conduct investigations of complex problems: Use research-based knowledge and research methods including design of experiments, analysis and interpretation of data, and synthesis of the information to provide valid conclusions.

Program Outcomes (POs)

- PO5: Modern tool usage: Create, select, and apply appropriate techniques, resources, and modern engineering and IT tools including prediction and modelling too complex engineering activities with an understanding of the limitations.
- PO6: The engineer and society: Apply reasoning informed by the contextual knowledge to assess societal, health, safety, legal and cultural issues and the consequent responsibilities relevant to the professional engineering practice.
- PO7: Environment and sustainability: Understand the impact of the professional engineering solutions in societal and environmental contexts, and demonstrate the knowledge of, and need for sustainable development.
- PO8: Ethics: Apply ethical principles and commit to professional ethics and responsibilities and norms of the engineering practice.
- PO9: Individual and team work: Function effectively as an individual, and as a member or leader in diverse teams, and in multidisciplinary settings

Program Specific Outcomes (PSOs)

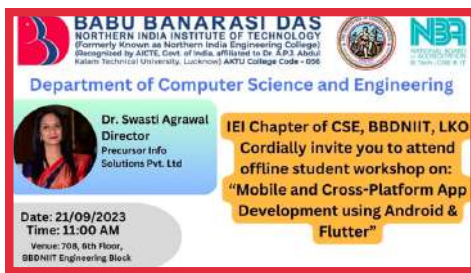
- Ability to design and develop solutions for societal problems by using emerging technologies and standardized emerging principles.
- Develop an understanding for conceptual and practical aspects of programming languages with databases and develop solutions using suitable data structures and algorithmic techniques

Departmental Events & Seminars



- Expert Talk on Career Advancements by Red Hat Academy held at BBDNIIT
- Talk delivered by Shirish V. Pandey (APAC Lead, Red Hat Academy)

Data Analytics Using Python Workshop



- Held in association with the IEI Student's Chapter of Information Technology to enhance students' analytical capabilities
- The program provided students with hands-on exposure to data processing tools and modern industry-relevant technologies.

Internal Hackathon for SIH 2023



- BBDNIIT conducted an internal hackathon to select top talent for the Smart India Hackathon (SIH) 2023
- The event encouraged students to develop creative solutions for real-world problems under the MoE's Innovation Cell initiative.

INDUCTION & ORIENTATION 2024

- It was successfully organized by the Value Education Cell in collaboration with Dyutiman – The Literary Society of BBDNIIT, which includes active participation from many students of the CSE Department.
- The event aimed to welcome the new batch of students and introduce them to the academic culture, values, and opportunities available at the institute.
- An inspiring address by the esteemed Director motivated the students to pursue excellence in academics, innovation, and personal development.
- Various interactive activities, introductions to student clubs, and committee presentations were conducted to help newcomers understand the vibrant campus ecosystem.
- Overall, the induction programme served as a platform to build connections, inspire confidence, and familiarize students with the diverse opportunities within the college community.

INSPIRUS 3.0 - ANNUAL LITERARY FESTIVAL

- It was successfully organized by Dyutiman – The Literary Society of BBDNIIT, celebrating creativity, expression, and the spirit of literature among students.
- The festival was conducted under the leadership of Chirag Saxena, a 4th year B.Tech ECE student and the current Coordinator of Dyutiman, whose dedication and vision played a key role in the successful execution of the event.
- The festival featured engaging events such as debates, creative writing, poetry recitation, storytelling, and extempore speaking, encouraging students to showcase their ideas and talents.
- INSPIRUS 3.0 served as a platform for young minds to express their thoughts, develop communication skills, and celebrate the power of words and ideas.
- The festival once again highlighted the commitment of Dyutiman towards promoting literary excellence and intellectual engagement within the campus.

Tackling Plastic Waste: A Complete Guide to Sustainable Management

Plastic is everywhere, from packaging that keeps our food fresh to bottles that hold our drinks. However, with convenience comes responsibility. The amount of plastic waste generated any given day calls for efficient management as a means to protect our environment. This article is going to take you on a journey concerning plastic waste, right from collection to its disposal, introducing innovative methods and practices shaping the future of sustainability.

Collection: The First Step in the Journey

Before plastic can be transformed or repurposed, it needs to be collected efficiently. Two dominant methods rule the roost:

Curbside Collection:

- *Single-Stream Recycling:* Imagine a world where recycling is as easy as throwing everything into one bin. That's the beauty of single-stream recycling. It's convenient for consumers but demands sophisticated sorting processes further down the line.
- *Dual-Stream Recycling:* A bit more hands-on is the dual-stream recycling approach. In this methodology, residents separate plastics from other recyclables at the source for a cleaner and more efficient recycling process.

Drop-Off Centers:

- *Bottle Banks:* Plastic bottle recycling finds its ultimate destinations in these bottle banks. Conveniently situated in public areas, bottle banks ensure that a contribution toward a cleaner planet is only a few steps away.
- *Plastic-Stream Recycling:* For those who want to go the extra mile, these centers accept more types of plastics to make sure that different kinds of plastic waste are dealt with appropriately.

Sorting: Separating the Trash from the Treasure

Collected plastic wastes go to sorting facilities where painstaking separation is done. Why? So each type of plastic is treated most effectively.

Manual Sorting:

- *Visual Inspection:* Skilled workers sort plastics by a visual look, identifying types based on colour, shape, or other visible characteristics.
- *Tactile Identification:* Sometimes, a touch of magic is created with just a touch. Workers can feel the texture and rigidity of plastics to ensure each piece finds its right place.

Automatic Sorting:

- *Near-Infrared Spectroscopy (NIR):* Just imagine a high-tech system where plastics are lit up to tell what chemical makeup they are made of. NIR is fast, accurate, and a real game-changer when it comes to waste management.
- *X-Ray Fluorescence (XRF):* Some plastics hide their secrets in their chemical composition, and XRF is the technology used to detect them. It means materials like PVC are sorted out with much precision.

Processing: Give Plastic a Second Life

Sorting plastic waste isn't enough; it follows suit by readying it for processing. Now things get exciting: taking refuse material and turning it into useful resources.

Mechanical Recycling:

- *Shredding:* The first step in mechanical recycling is shredding the plastic into smaller, more manageable pieces.
- *Melting:* The bits then melt into a moldable shape that can be reshaped.
- *Extrusion:* Finally, plastic melts are extruded into pellets or new products ready to start their life afresh.

Chemical Recycling:

- *Depolymerization*: This is the process where the plastics are broken down into simple building blocks. These can then be reassembled into new plastics.
- *Solvolysis*: It is the use of solvents in dissolving and breaking down plastics into their basic building blocks, which subsequently could be employed either as raw materials in producing new plastic products or other useful material forms.

End-Use Applications: From Waste to Wonder

Recycled plastic is not all about keeping trash out of landfills but creating useful and appealing products that meet our daily needs.

Packaging:

- *Food Containers*: Recycled plastics are best suited for making food containers and help keep our meals fresh along with maintaining cleanliness in the environment. *Bottles and Jars*: One of the most usual applications for recycled plastics, these items underscore the capability to change trash into a useful product.

Construction:

- *Insulation*: Recycled plastic forms the base for insulation materials, which make a big deal in saving energy in buildings. *Pipes and Fittings*: These are durable and resistant to chemicals, hence very suitable for building purposes.

Disposal: The Final Step

Even with all these efforts, not all plastic can be recycled. For the waste that remains, disposal methods become important.

Landfilling:

- *Sanitary Landfills*: These sites are carefully managed to minimize environmental impact, containing waste in a controlled manner.
- *Bioreactor Landfills*: These landfills are new and innovative, intensifying decomposition processes to degrade organic material with the use of heightened microbial activity.

Incineration:

- *Waste-to-Energy*: Incineration can convert plastic waste into energy with volume reduction of landfills and generating electrical energy simultaneously.
- *Cement Kilns*: Sometimes, plastic wastes are used as an alternate fuel in the manufacture of cement—a very realistic and useful environmental solution.

Policies and Regulations: Steering the Ship

Good practices in waste management do not happen by accident but are instead the end result of stringent policies and rules. *Extended Producer Responsibility (EPR)*: EPR policies ensure that the responsibility for the lifecycle of a product, from its making to its disposal, rests with the manufacturer itself, hence encouraging more environmentally friendly considerations. *Recycling Targets*: Ambitious targets for recycling are laid down by governments, which challenge industries to bring in more innovative technologies and investments for easier and greater recycling.

Conclusion: A Way Forward

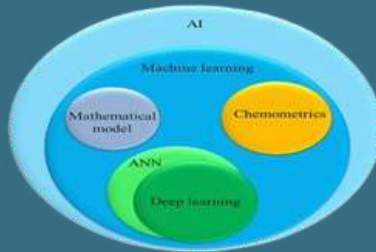
The processing of plastic waste from its collection to disposal is a long but important journey. Sorting, treatment, and final disposal—all these stages contribute to the reduction of environmental impacts and are fundamental to sustainability. We can make it happen, with good policy measures, turning plastic waste from problem to resource. The implementation of such strategies is crucial for reduced plastic waste, preservation of resources, and better care for our planet for future generations to enjoy.

**AUTHOR: SHIVANG AGRAWAL
BATCH 2026**

Artificial Intelligence and Machine Learning: Revolutionizing the Future

Artificial Intelligence (AI) and Machine Learning (ML) are revolutionizing numerous industries by enabling machines to learn from data and make decisions with minimal human intervention. AI refers to the broader concept of machines being able to perform tasks in a way that we would consider "smart." ML, a subset of AI, specifically focuses on the development of algorithms that allow computers to learn and adapt through experience.

AIML is also transforming how businesses operate by optimizing processes, enhancing customer experiences, and creating new revenue streams. With the exponential growth of data, AIML systems are becoming increasingly sophisticated, offering deeper insights and more accurate predictions. As these technologies continue to evolve, they hold the potential to solve some of the most pressing challenges faced by society today, driving innovation and economic growth.



These technologies are not just theoretical concepts; they are actively transforming how businesses operate across various sectors.

In healthcare, AI and ML are used for predictive analytics, improving diagnosis accuracy, personalized medicine, and even robotic surgery. For example, ML algorithms can analyze vast amounts of patient data to predict disease outbreaks or recommend tailored treatments.

The finance industry leverages AI for fraud detection, risk management, algorithmic trading, and customer service. Chatbots powered by AI provide real-time support, while ML models predict market trends and optimize investment strategies.

In manufacturing, AI-driven automation enhances production efficiency, predicts equipment failures through predictive maintenance, and improves supply chain management. Smart factories utilize ML to optimize processes and reduce waste.

AUTHOR: SANJANA KESHARI
BATCH 2026

Code That Thinks – The Rise of Artificial Intelligence in Computer Science

In the early days of computer science, computers were designed simply to follow instructions. They performed calculations, stored data, and executed commands exactly as programmed. But today, a new era has begun—an era where machines can learn, adapt, and make decisions. This transformation is driven by Artificial Intelligence (AI), one of the most revolutionary fields in computer science.

Artificial Intelligence refers to the development of computer systems that can perform tasks normally requiring human intelligence. These tasks include recognizing speech, analyzing images, understanding language, and even predicting future outcomes. Technologies like machine learning, neural networks, and deep learning allow computers to analyze massive amounts of data and improve their performance over time without explicit programming.

The impact of AI can already be seen in everyday life. Virtual assistants such as Siri, Google Assistant, and recommendation systems used by platforms like Netflix and Amazon rely heavily on AI algorithms. Self-driving car technology developed by companies like Tesla uses computer vision and AI models to interpret the environment and make driving decisions in real time.

In the field of healthcare, AI is helping doctors detect diseases earlier and more accurately. Advanced algorithms can analyze medical images and identify patterns that may not be easily visible to the human eye. Similarly, in cybersecurity, AI helps detect unusual activities in networks and prevents cyberattacks before they cause serious damage.

For students and researchers in computer science, AI represents a vast field of opportunity. From developing smarter applications to solving complex global problems, the potential of AI is immense. As technology continues to evolve, one thing is certain: the future of computer science will not just be about writing code, but about creating systems that can think, learn, and innovate alongside humans.

In conclusion, Artificial Intelligence is not just another technological trend—it is a transformative force that is redefining the capabilities of computers. As we move forward, the collaboration between human intelligence and machine intelligence will shape a smarter and more connected world.

**AUTHOR: SUDHANSHU PANDEY
BATCH 2026**

Lane Line Detection System for Vehicle Using Python

Research Paper

Authors: Soni Yadav, Kratika Tripathi, Ankan Singh, Vikas Porwal

Publishing Journal: International Journal for Research in Applied Science & Engineering Technology (IJRASET)

DOI: Not Available

Keywords: Face Recognition, Automated Attendance System, Image Processing, Deep Learning, Computer Vision, Face Detection, Face Matching

Abstract:

This research presents a real-time collision detection and lane assistance system implemented using Python and OpenCV. The system leverages computer vision techniques to detect vehicles and lane lines, calculate distances to detected objects, and issue timely alerts to prevent collisions. The implementation aims to enhance driver safety by providing real-time feedback about the vehicle's surroundings. This paper details the system's design, methodology, and performance evaluation. Keywords: Collision Detection, Lane Assistance, OpenCV, Python, Computer Vision, Real-Time Processing.

The first one, called the Safety Time Algorithm, checks how much time is left before a potential collision and compares it to a safety threshold. It mainly uses something called Time to Collision (TTC) as a key factor. The second type, known as the Safety Distance Algorithm, looks at the minimum space required between a car and an obstacle to avoid a collision. This is the distance the car should maintain under the current conditions. To make this work, we developed a smart computer program using Python, a programming language known for its simplicity and flexibility. Python allows programmers to write less code but still express complex ideas clearly. It supports various programming styles and comes with a large library of functions, making it suitable for a wide range of applications.

BANKING MANAGEMENT SYSTEM

Research Paper

Authors: Shashikant Pandey, Shreya Sharma, Sakshi Pandey, Shailendra Sharma, K.S. Pathak

Publishing Journal: International Journal of Scientific Research in Engineering and Management (IJSREM)

DOI: Not Available

Keywords: Banking Management System, Financial Systems, Digital Banking, Risk Management, Customer Management, Transaction Processing

Abstract:

The rapid growth of the banking sector in India has increased the need for efficient and secure management systems capable of handling large volumes of transactions and customer data. Traditional banking operations often face challenges related to inefficiency, risk management, and customer service. This research presents a Banking Management System (BMS) designed to streamline banking operations, enhance security, and improve customer satisfaction.

The proposed system provides functionalities such as account management, transaction processing, loan handling, and customer data management. It incorporates modern technological advancements including digital banking solutions and structured data handling to ensure scalability and efficiency. The system also emphasizes risk management and regulatory compliance, which are critical in the banking sector.

The implementation demonstrates improved operational efficiency, better customer relationship management, and enhanced data security through multi-level protection mechanisms. The results indicate that adopting such systems can significantly reduce operational risks, improve service quality, and provide a competitive advantage to financial institutions. Overall, the Banking Management System offers a reliable and scalable solution for modern banking needs while addressing challenges in security, efficiency, and customer satisfaction.

Automation of Rail Boarding System

Research Paper

Authors: Vibhor Mishra, Srishti Srivastava, Shouryam Tiwari, Tanya Singh

Publishing Journal: International Journal of Scientific Research in Engineering and Management (IJSREM)

DOI: <https://doi.org/10.55041/IJSREM19369>

Keywords: Digital Rail Boarding, QR Code Authentication, Online Ticket Booking, Railway Automation, Smart Transportation, Passenger Verification

Abstract:

The increasing demand for railway transportation and the limitations of traditional boarding systems have led to challenges such as overcrowding, long queues, and unauthorized passenger entry. This research proposes an Automation of Rail Boarding System aimed at digitizing the entire process from ticket booking to passenger boarding. The system integrates online ticket booking with QR code-based authentication to streamline passenger verification and reduce manual intervention.

The proposed solution generates a unique QR code during ticket booking, which can be scanned at train coaches to validate passenger identity and booking details in real time. The system architecture includes a web-based platform for ticket reservation, database management for passenger information, and scanning devices installed at boarding points. As illustrated in the flowchart on page 2, users interact with the system through booking, QR generation, and verification stages, ensuring a seamless and automated workflow.

The implementation demonstrates significant improvements in efficiency by reducing waiting time, eliminating unauthorized boarding, and minimizing physical crowding at stations. Additionally, the system enhances passenger convenience by enabling real-time booking and verification, even at the time of boarding. The findings suggest that such a digital boarding system can greatly improve railway operations, ensure better security, and enhance overall passenger experience.

DROWSINESS DETECTION SYSTEM USING MACHINE LEARNING

Research Paper

Authors: Naman Jain, Arpit Mishra, Khushi Verma

Publishing Journal: International Journal of Scientific Research in Engineering and Management (IJSREM)

DOI: <https://doi.org/10.55041/IJSREM22337>

Keywords: Drowsiness Detection, Machine Learning, Convolutional Neural Network (CNN), Computer Vision, Driver Safety, Eye Detection

Abstract:

Drowsy driving is a significant contributor to road accidents worldwide, accounting for a substantial percentage of fatal incidents caused by reduced alertness and fatigue. This research presents a Drowsiness Detection System (DDS) that leverages machine learning and computer vision techniques to monitor driver alertness in real time. The system focuses on analyzing eye states to determine drowsiness and provides timely alerts to prevent accidents.

The proposed system utilizes a Convolutional Neural Network (CNN) model built using Keras to classify eye states as open or closed. The methodology includes data collection and preprocessing, model training, and real-time evaluation using webcam input. As illustrated in the flowchart on page 4, the system follows a pipeline of face detection, eye extraction, classification, and score-based drowsiness evaluation. A scoring mechanism continuously tracks eye closure duration, and when a predefined threshold is exceeded, an alert sound is triggered. Experimental results indicate strong performance in detecting drowsiness with high accuracy, precision, and recall, demonstrating the system's effectiveness in real-time scenarios. The system operates efficiently even under varying lighting conditions and can distinguish between normal blinking and prolonged eye closure. Overall, the proposed solution provides a reliable, non-intrusive, and scalable approach to enhancing driver safety and reducing accidents caused by fatigue.

Sentiment Prediction Using Voice

Research Paper

Authors: Jaya Vishwakarma, Keshav Sharma, Dr. Anurag Shrivastava

Publishing Journal: International Journal of Scientific Research in Engineering and Management (IJSREM)

DOI: Not Available

Keywords: Sentiment Analysis, Speech Emotion Recognition, Voice Processing, Machine Learning, Audio Analysis, Natural Language Processing

Abstract:

With the increasing use of voice-based communication and digital content, analyzing sentiment from speech has become a critical area of research. This study presents a Sentiment Prediction System using voice data to identify emotions and detect potentially harmful or fraudulent interactions in real time. The system aims to analyze speech signals and classify them into sentiment categories such as positive and negative, with potential applications in fraud detection, customer service, and behavioral analysis.

The proposed system processes audio input by extracting relevant acoustic features and converting speech into text using speech recognition techniques. As illustrated in the architecture diagram on page 3, the workflow includes speech input, speaker discrimination, speech recognition, parsing, and sentiment classification. Machine learning models are then applied to classify sentiment based on extracted features from both audio and textual data, enabling a multimodal approach.

The system demonstrates the ability to detect emotional patterns and identify suspicious or negative interactions, particularly in call-based environments. Despite challenges such as background noise and data variability, the model provides a viable solution for real-time sentiment detection. The findings highlight the potential of integrating voice-based sentiment analysis into applications such as fraud detection systems, call centers, and intelligent virtual assistants.

From the Editors Pen.....

Dear Readers,

It is with immense pride and heartfelt excitement that we present to you the inaugural edition of our departmental magazine, Techvishta! This debut release is a vibrant volume, woven with the threads of innovation, technical excellence, and the dynamic spirit that defines the Department of Computer Science and Engineering at BBDNIIT.

Our dedicated editorial team has poured their heart and soul into every page of this publication. We have meticulously captured the pulse of our department—from the academic brilliance in our classrooms to the cutting-edge advancements in our campus labs. This edition highlights the vibrant energy of our student societies and the relentless passion of our technical teams, who continue to push the boundaries of what is possible.

Techvishta stands as a beacon of the tireless efforts and unwavering commitment of our students and faculty. Within these pages, you will find a record of our collective journey:

- Academic Milestones: Celebrating the research and publications that strengthen our foundation.
- Technical Synergy: Showcasing workshops on Python, Salesforce, and Mobile App Development that bridge the gap between theory and industry.
- Innovation & Spirit: Capturing the drive of our Hackathon winners and the vision of our budding entrepreneurs.

This magazine is more than just a publication; it is a celebration of our dreams and the unyielding spirit of the BBDNIIT family. As you journey through these pages, we invite you to feel the pulse of our department and embrace the shared vision that propels us toward greater heights.

Thank you for being part of this incredible journey. Here's to new beginnings, endless possibilities, and the boundless potential of the CSE department!

With Heartfelt Gratitude,

The Editorial Team

Student : Shivang Agrawal, 3rd year, Computer Science & Engineering

Guided By: Prof. (Dr.) Anurag Shrivastava (HOD, CSE)

Editors



MR. UTTAM KUMAR SINGH
Assistant Professor
Faculty Editor

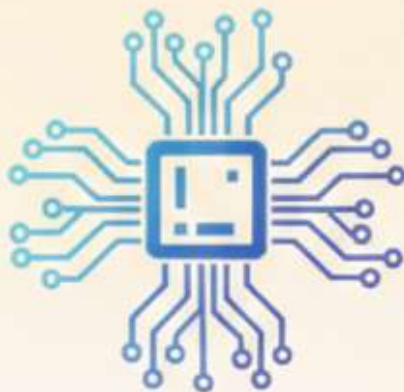


SHIVANG AGRAWAL
CSE - 2026 Batch



BBDNIIT

Babu Banarasi Das Northern India Institute of Technology



"Do the best you can until you know better.
Then when you know better, do better."



Babu Banarasi Das Northern India Institute of Technology

Sector-II, Dr. Akhilesh Das Nagar, Ayodhya Road, Lucknow (U.P.) - 226028, India

Ph.: +91-(522)-6196222/6196223/6196336/Website: www.bbdniit.ac.in/Email: info@bbdniit.ac.in