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 ● DataCite : CSE(DS) Newsletter ●

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# AI AND DATA SCIENCE REVOLUTIONIZING HEALTHCARE

TRANSFORMING TODAY, SHAPING TOMORROW



## KEY CONCEPTS YOU SHOULD KNOW

### Data Science

The process of extracting insights from large datasets using algorithms and statistical methods to improve healthcare decisions.

### Artificial Intelligence

Technology that mimics human intelligence to perform tasks like diagnosis and decision-making.

### Machine Learning

A subset of AI where systems learn from data to improve over time without explicit programming.

### Deep Learning

An advanced form of ML modeled after the human brain, useful for tasks like image recognition.

### Big Data

Large, complex datasets used to uncover trends and improve patient outcomes in healthcare.

### Predictive Analytics

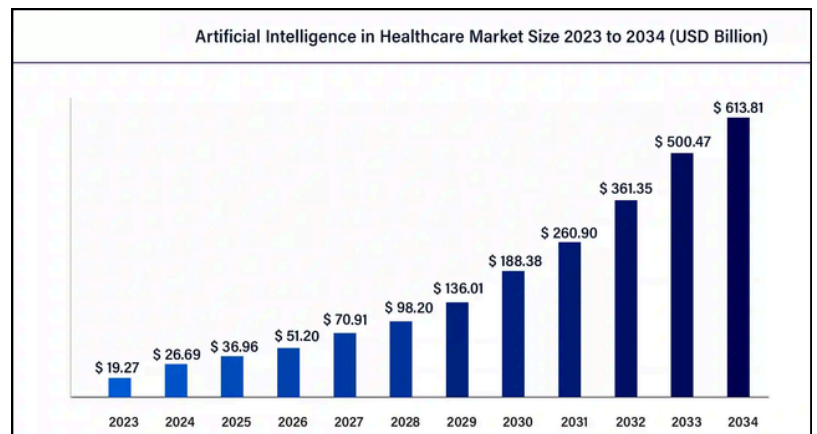
The use of data to predict future health outcomes, helping prevent diseases and manage conditions.

## INTRODUCTION

In the last decade, Artificial Intelligence (AI) and Machine Learning (ML) have emerged as game changers across industries. But their influence in healthcare is particularly profound. These technologies are enhancing diagnostics, optimizing treatment plans, accelerating drug discovery, and personalizing patient care.

According to a report by Precedence Research, The global artificial intelligence (AI) in healthcare market size accounted for USD **26.69 billion** in 2024 and is predicted to reach around USD **613.81 billion** by 2034, growing at a **CAGR of 36.83% from 2024 to 2034**. North America AI in healthcare market size reached USD 8.67 billion in 2023.

This newsletter delves into how AI and data science are transforming healthcare today, providing real-world examples, exploring ongoing projects, and looking at what the future holds for this exciting field.



## HEALTHCARE APPLICATIONS

### Google's DeepMind AI

Google's DeepMind AI has shown impressive accuracy in breast cancer detection, outperforming radiologists in a study of 29,000 mammograms. The model reduced false positives by 5.7% and false negatives by 9.4%, making it a powerful tool for early diagnosis. Research from Imperial College London and Google Health indicates its potential to support radiologists by improving detection rates in clinical settings.[1]



### IBM Watson Health

AI has enabled a shift from generalized treatments to highly personalized medical care. IBM Watson Health, through extensive data analysis, can provide unique treatment insights within minutes, improving diagnosis accuracy up to 90%. Similarly, 23andMe's use of AI to analyze genetic markers provides users with detailed health predictions, offering patients proactive options based on hereditary factor.[2]



### Drug Discovery

For Drug Discovery, Insilico Medicine utilizes generative AI to efficiently develop drug candidates, notably progressing a treatment for idiopathic pulmonary fibrosis to Phase 2 trials within two and a half years. Traditionally, this process costs over \$400 million and takes around six years, but Insilico completed it for one-tenth of the cost and time. Their platform, Chemistry42, employs NVIDIA GPUs to target and design compounds, showcasing AI's potential to transform pharmaceutical R&D and accelerate treatments for complex diseases.[3]



### Robotic Surgery

The Da Vinci Surgical System revolutionizes minimally invasive surgery by allowing surgeons to perform procedures with enhanced precision. Console that translates hand movements into real-time instrument actions, providing a greater range of motion than traditional methods. The system features a high-definition, 3D vision system for detailed surgical views. Key components include: 1. Surgeon Console, 2. Patient Cart, 3. Vision Cart.[4]



### References

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## RESHAPING THE HEALTHCARE SYSTEM

### Cost Savings

AI is expected to save healthcare systems up to \$300 billion annually by automating tasks like scheduling and billing, reducing administrative burdens (McKinsey).[5]

### Improved Patient Outcomes

Predictive analytics are lowering hospital readmission rates by 32%, helping manage chronic conditions like diabetes through early interventions.

### Virtual Health Assistants

AI chatbots from Babylon Health and Ada Health handle up to 80% of primary care consultations, easing healthcare professional workloads by guiding patients on symptom management.



*"We need to design and build AI that helps healthcare professionals be better at what they do. The aim should be enabling humans to become better learners and decision-makers."*

- Mihaela van der Schaar, Director of the Cambridge Centre for AI in Medicine

## ONGOING PROJECTS & FUTURE INNOVATIONS

### Microsoft Cloud

This platform offers AI tools for data integration, clinical workflow automation, and secure patient data handling, reducing administrative tasks and enhancing care quality.

### Google Health

Google's AI models for mammogram analysis have improved diagnostic accuracy, crucial for early breast cancer detection and reducing unnecessary treatments.

### NIH Bridge2AI

Focused on reducing AI biases, Bridge2AI is building diverse health datasets to ensure AI tools perform fairly across all demographics, promoting equitable healthcare solutions



*"AI's true power in healthcare lies in augmenting the doctor's ability, not replacing it."*

- Dr. Fei Fei Li, AI Researcher & Professor, Stanford University

## EVENTS



### PRODUCT SHOWCASE 2024

The Product Vidya 2024, held on September 27, 2024 at college, was a key event organized by the student chapter of Computer Science and Engineering (Data Science). The exhibition showcased advanced technologies and innovative concepts, providing a platform for students and industry professionals to interact and share knowledge. The event aimed to highlight industry trends, promote collaboration, and offer networking opportunities, especially for students seeking career prospects. The showcase featured products from various companies and culminated in a successful display of cutting-edge innovations.



### CODE-O-FIESTA 2024

Code-O-Fiesta 2024, held on September 20 at Vidyavardhini's College of Engineering & Technology, was organized by the Department of Artificial Intelligence & Data Science and Computer Science Engineering (Data Science). The event began with a lamp-lighting ceremony, followed by speeches from the chief guest and principal. Participants presented solutions in three domains, with winners recognized in Healthcare and Agriculture. The event concluded with awards and certificates.

## SEMINARS

### Placement Guidance



The CSE (DS) Department, in collaboration with the Placement & Training Cell, organized a "Placement Guidance" seminar for final-year students. Coordinated by Ms. Janisa P., Ms. Odilia G., and Mr. Ichhanshu J., the event featured Dr. Anindita Chatterjee, a Professor and Research Director at Manav Rachna International Institute of Research and Studies.

### Academic MiniProjects



The session began with a welcome from Mr. Ichhanshu Jaiswal, introducing speaker Mr. Vikram Singh Kuswah from the CSE(DS) department. Mr. Kuswah shared his journey from Khargar to Chicago, advised students on avoiding common project mistakes, and emphasized that building projects enhances technical skills, making students stand out in the industry.

## INDUSTRIAL VISITS



### RELIANCE JIO, RELIANCE CORPORATE PARK NAVI MUMBAI

On July 12, 2024, 15 students from our department, led by Mr. Ichhanshu Jaiswal, visited Reliance Jio's corporate park in Navi Mumbai. The tour showcased Jio's 5G advancements, its "Jiobharat" phone series for rural connectivity, and satellite-based broadband with SES for remote areas. Highlights included JioHumsafar for vehicle safety, JioHome for smart homes, JioBusiness's Dynamo robot and JioGlass for mixed reality, and JioHealthHub's healthcare innovations. The students gained valuable insights into Jio's technology for smart cities, agriculture, and healthcare.

## PLACEMENTS 04 Successful Placements

# BRISTLECONE

In the 7th semester alone, 4 students have secured placements. These achievements signify the beginning of a promising journey for our students. Students placed in Bristlecone from BE CSE-DS in the academic year 2024-25.

1. **Mukesh Prajapat**
2. **Divyal Patil**
3. **Puja Chafekar**
4. **Viraj Wadke**

## TOPPERS

### SEM 8

1. Jidnyasa Patil	9.81
2. Harushkumar Devmurari	9.71
3. Jayesh Berde	9.71
4. Vaishnavi Saindane	9.67

### SEM 6

1. Viraj Wadke	10
2. Sairaj Varavdekar	9.74
3. Prachi Nibe	9.74

### SEM 4

1. Soham Shivpuje	10
2. Siddharth Chakravarthy	10
3. Abhishek Mishra	9.75

### SEM 2 SE1

1. Eshika Agarwal	9.35
2. Chetas Mohite	8.95
3. Yasmeen Ahmadabadwala	8.80

### SEM 2 SE2

1. Kewal Mehta	9.25
2. Manish Kushwaha	9.15
3. Aditya Patil	8.90

### SEM 2 SE3

1. Sneha Thakur	9.40
2. Pranvakumar Murali	9.20
3. Aishwarya Shetty	9.25

## PHOTOS



## STUDENT ACHIEVEMENTS

1st Position in the 'TechVision 2024- Paper Presentation Competition' under National Student Conference on Emerging Trends and Technology (NSC-ETT) organized by Thakur College of Engineering and Technology held on 4th October 2024.



1st Runner Up position in the 'PROJECT and PRODUCT Exhibition' organised by Computer Society of India of Atharva College of Engineering held on 12th August 2024.

Runner-up in 'Shabdankan- Essay Writing Competition' organized by EBSB-VCET held on 30th September 2024.



## FACULTY ACHIEVEMENTS

- Ms. Kranti Gule Completed Self-Financing Faculty Development Program on "Exploring IoT & 5G using AI, ML," organized by Ajeenkya DY Patil School of Engineering held from 2nd September 2024 to 6th September 2024.
- Statistical assessment of Indian classical music's role in diabetes, thyroid, hypertension management in the International Journal of Information Technology published on 10th October 2024 by Mr. Yogesh Prabhakar Pingle.
- 3-day Face-to-Face FDP on "Inculcating Universal Human Values in Technical Education" organized by the All India Council for Technical Education (AICTE) held from 31st August to 2nd September, awarded to Mrs. Chaitali Mhatre and Mr. Chinmay Vanjare
- Expert Talk on "Deep Learning" by Mr. Ichhanshu Jaiswal, held at Government Polytechnic Bandra.

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