IPS ACADEMY
INSTITUTE OF ENGINEERING AND SCIENCE INDORE(M.P)

E-Magazine

Department of Computer Science and Engineering -AIML

2024-25

IPS ACADEMY

Institute of Engineering and Science, Indore(M.P)
A UGC Autonomous Institute
Affiliated to Rajiv Gandhi Proudyogiki Vishwavidyalaya, Bhopal(M.P)

Message from our Principal

Technical Education is the most potential instrument for socio-economic change. Presently, the engineer is seen as a high-tech player in the global market. Distinct separation is visible in our education between concepts and applications. Most areas of technology now change so rapidly that there is a need for professional institutes to update the knowledge and competence. Institute of Engineering and Science, IPS Academy is a leading, premium institution devoted to imparting quality engineering education since 1999. The sustained growth with constant academic brilliance achieved by IES is due to a greater commitment from management, dynamic leadership of the president, academically distinctive and experienced faculty, disciplined students and service oriented supporting staff.

The Institute is playing a key role in creating and ambiance for the creation of novel ideas, knowledge, and graduates who will be the leaders of tomorrow. The Institute is convinced that in order to achieve this objective, we will need to pursue a strategy that fosters creativity, supports interdisciplinary research and education. This will also provide the students with an understanding and appreciation not only of the process of knowledge creation, but also of the process by which technology and knowledge may be used to create wealth as well as achieve social economic goals.

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All the Best.
Dr. Archana Keerti Chowdhary
Principal

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Message from our HOD

Today we find that information technology has become overwhelmingly pervasive, while its parent, computing science, has become correspondingly hard to find. While many CS educational institutions have shifted focus from core CS. This is the single most important attribute of the education offered here. Our department has remained true to the vision on which it was founded. There are several ways to present the canonical core of computer science. Over the years we have developed a distinct style and method that bridges the theory - practice divide while remaining grounded in the core. Technology changes rapidly, especially in the field of computing, whereas the science, if it changes at all, does so much more gradually. Our understanding is that persons who are clear and thorough about the fundamentals can adapt to rapid changes in technology relatively easily. We want the education imparted to our students to be the basis of a life time of learning.
Our Department has produced hundreds of professionals and has established a name for itself in the country and abroad. They have consistently excelled in the highly competitive industrial environment, Best Employer/ awards in top-ranking companies. I attribute this success to the winning combination of a dedicated faculty that works hard at imparting quality education, a well-planned syllabus and last but not the least, our students.

Learning is a continuous process and does not end with the acquisition of a degree, especially because steady and rapid advances in computing technologies shorten the life of tools and techniques prevalent today. Therefore we do not aim to make our students walking manuals of any language or package. Instead, they are given a strong foundation in computer science and problem-solving techniques and are made adaptable to changes. We believe that this approach to teaching- learning, coupled with practical experience gained during Industrial Training in reputed organizations, equips our students to handle the challenges posed by the software industry

Dr. Neeraj Shrivastava
HOD Computer Science and Engineering Dept.
IPS Academy, Institute of Engineering & Science

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DEPARTMENT OF COMPUTER SCIENCE & ENGINEERING - ARTIFICIAL INTELLIGENCE AND MACHINE LEARNING (CSE-AIML)

The Department of Computer Science & Engineering with a specialization in Artificial Intelligence An Machine Learning (CSE-AIML) stands as a beacon of technological advancement and innovation as industries worldwide rapidly adopt AI and ML technology, our department is committed to preparing students to lead in this transformative era.

Ved Kumar Gupta
Asst. Prof, Branch coordinator

Vandana Dubey
Asst. Prof

Vasudha Sharma
Asst. Prof

Yogita Barse
Asst. Prof

Aditi Baser
Asst. Prof

Pratibha Singh Tomar
Asst. Prof

Sachin Soni
Asst. Prof

Abhilasha Vyas
Asst. Prof

Vision and Mission

Attaining global recognition in computer science and engineering education , research and training to mee the growing needs of industry and society.

Provide Quality education , in both the theoritical and applied foundations of computer science and train students to effectively apply this education to solve real world problems

State-of-the-Art Infrastructure

Our vision is to cultivate a new generation of engineers and researchers who are not only proficient in the core principles of AI and ML but are also capable of applying these technologies to solve real-world problems. We aim to bridge the gap between theoretical knowledge and practical application, equipping our students with the skills to excel in a competitive, ever-evolving landscape.

Curriculum

The CSE-AIML curriculum is meticulously designed to provide a strong foundation in both computer science and the specialized domains of AI and ML. Students are introduced to essential concepts such as data structures, algorithms, and programming languages, followed by advanced courses in machine learning, deep learning, natural language processing, computer vision, and more. Our curriculum is continuously updated to reflect the latest trends and developments in the industry, ensuring that our graduates are always ahead of the curve.

Research and Innovation

Research is at the heart of our department. Our faculty members are engaged in groundbreaking research projects, ranging from developing intelligent systems for healthcare to creating autonomous agents for complex decision-making processes. Students are encouraged to participate in these projects, providing them with invaluable hands-on experience and the opportunity to contribute to the field's advancement.

Workshops and Collaborations

At IPS IES Academy Indore, we believe in providing our students with opportunities that go beyond traditional classroom learning. Through strategic workshops and collaborations, we aim to equip our students with the skills and knowledge they need to excel in today's competitive world.

One of our most significant collaborations is with IIT Bombay, where we have integrated the Spoken Tutorial Certification program for our AI/ML students. This collaboration allows our students to gain valuable, industry-relevant skills through hands-on training in cutting-edge technologies. The recent success of all our AI/ML students passing the Spoken Tutorial Tests with flying colors is a testament to the effectiveness of this collaboration.

In addition to this, we regularly organize specialized workshops that focus on emerging technologies, programming languages, and professional development. These workshops bring industry experts and academics to the campus, providing students with firsthand insights into the latest trends and practices.

By fostering such collaborations and organizing hands-on workshops, we are not only enhancing the academic experience but also preparing our students for successful careers in the tech industry.

TEDx 2025

IPS Academy, Indore, hosted its first-ever TEDx event, TEDx IPSA 2025. This historic occasion brought the global TEDx platform to the academy, making it an unforgettable experience for both students and faculty. The theme for the event, "Seek", inspired the attendees to explore new ideas, challenge existing norms, and dive deeper into knowledge. TEDx IPSA 2025 featured a series of thought-provoking talks, engaging discussions, and visionary speakers, all united by the goal of sparking curiosity and encouraging innovation.

IEEE INTERNATIONAL CONFERENCE

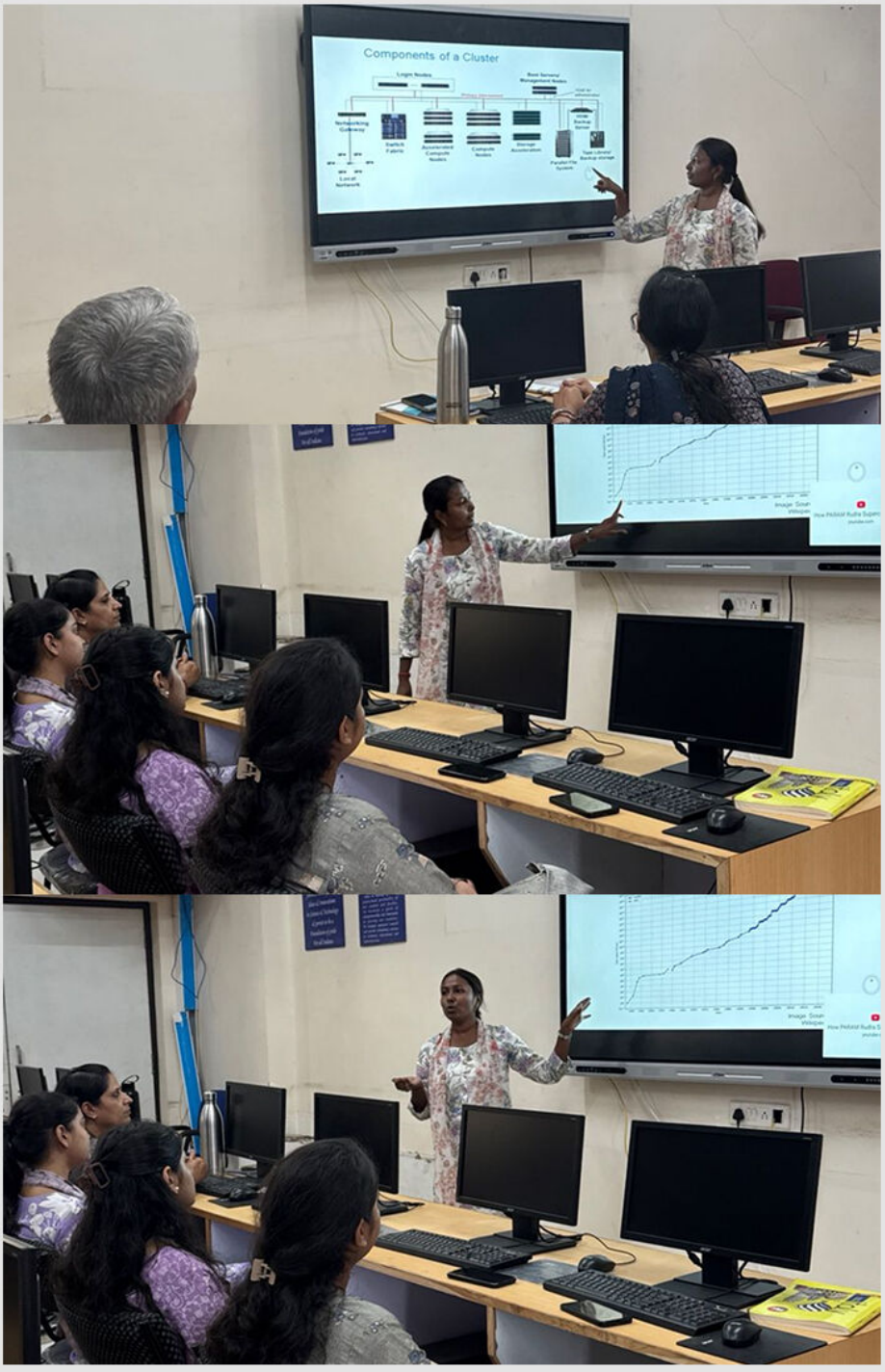
IPS Academy Institute Of Engineering and Science organize IEEE INTERNATIONAL CONFERENCE on "Computational, Communication and Information Technology" on FEBRUARY 07TH& 08TH, 2025.
The objective of this conference is to bring together leading research, academician , industry practitioners, and opportunities in computational sciences, Communication network, and information technologies. Prof Mr Ved Kumar Gupta successfully published a research paper and got the best paper Award. The objective of this conference is to bring together leading research, academician , industry practitioners ,and students from across the globe to share their insights and explore the challenges and opportunities in computational sciences, Communication networks, and information technologies.

Uddan Project Competition

The UDAAN Project Competition & Exhibition was held at IPS Institute of Engineering And Science Indore. This competition aims to provider a platform for student to showcase their projects and innovation.

Refresher Course

The Department of CSE-AIML is organize Refresher Course on High Performance Computing. Prof Ms. Yogita Barse successfully Deliver the sessions on High Performance Computing High performance computing most generally refers to the practice of aggregating computing power in a way that delivers much higher performance than one could get out of a typical desktop computer or workstation in order to solve large problems in science, engineering,or business.



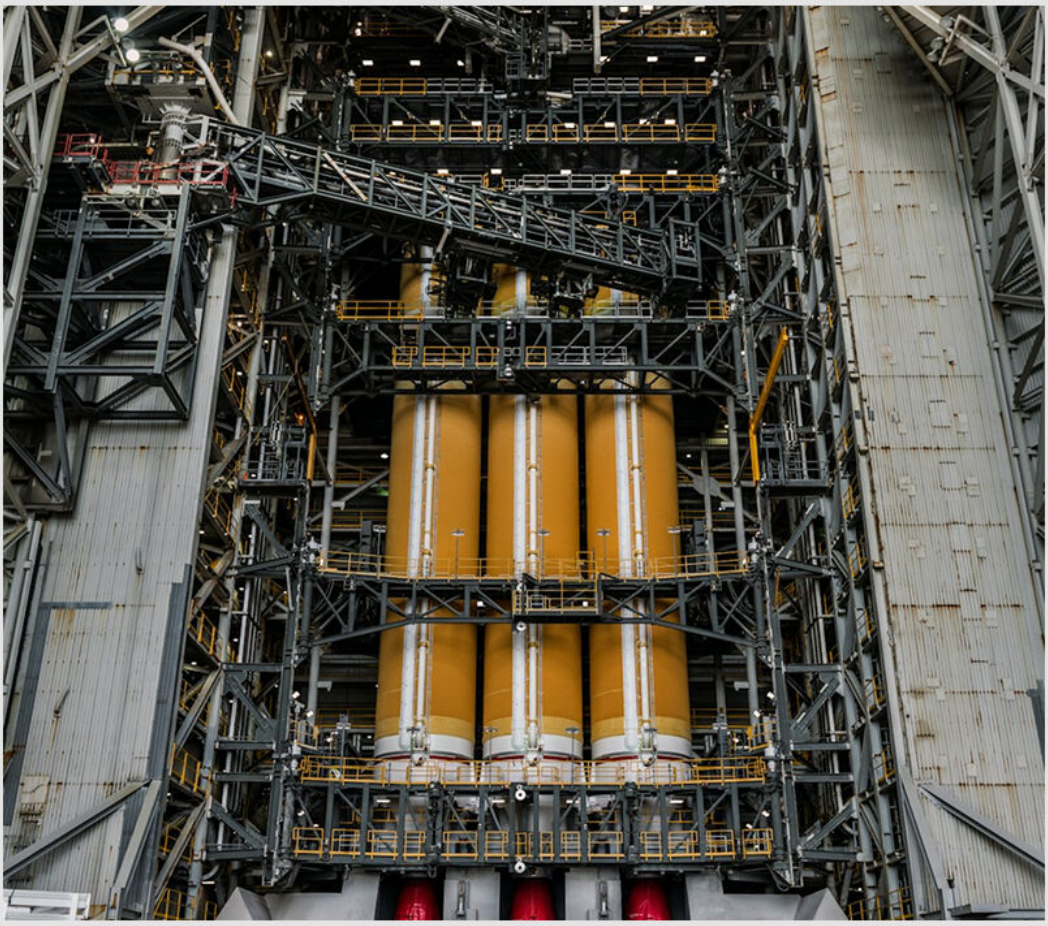
Indian Airforce Exhibition

An Exhibtion held on 16 January 2025 at IPS Academy Indore, The Indian Air Force (IAF) organizes various exhibitions and air shows to showcase its capabilities and heritage. One of the notable events is the Aero India, which is a biennial air show and aviation exhibition held in IPSA IES.,

Are you a student of engineering with an inclination towards state-of-the-art technology and a sense of duty towards serving the country? The Indian Air Force (IAF) provides a challenging and thrilling career opportunity where your engineering skills can soar. The recent "Wings of Opportunity" exhibition explicitly showcased the various opportunities present for engineering graduates, revealing how your technical acumen can lead to securing the skies of India. For those unable to attend, or simply wishing to discover more, this article explores the thrilling opportunities that lie ahead for engineering brains in the IAF.

"Wings of Opportunity" was more than a standard career guide, devoting considerable time to the specialized contributions that engineers make in the IAF. It highlighted the imperative for technically qualified personnel to administer, keep, and develop the highly advanced fleet of aircraft, weapon systems, and communication systems that constitute the core of the Air Force. The exhibition was a strong showcasing for engineering students of how their classroom learnings can be put directly into practice in high-stakes, real-world situations.

A significant emphasis was on the wide range of engineering disciplines in the IAF. No matter your specialization in Aeronautical Engineering (Mechanical or Electrical), Electronics and Communication Engineering, Computer Science Engineering, or any other related area, the IAF has jobs designed for your area of expertise. The exhibition explained each branch's specific duties, from aircraft maintenance and design upgrades to developing and managing sophisticated avionics, radar systems, and communication networks. Imagine being at the cutting edge of technology, operating cutting-edge equipment that protects the country's airspace.

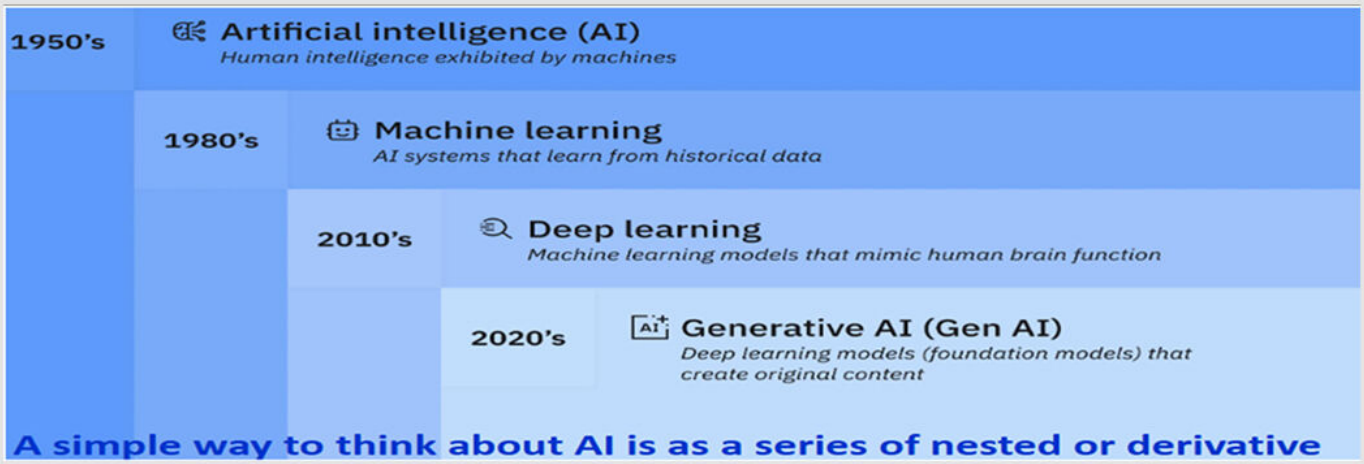


Face-to-face contact with IAF officers who have an engineering background was especially enlightening for participants. Such contact presented an eye-opening view of challenges and benefits in using engineering concepts in a working environment. Students had opportunities to gain knowledge about the specific assignments they would work on, professional growth and extension opportunities, and the specific combination of technical competence and leadership abilities demanded in the IAF.

Prof. Megha Chodka

Future scope of AI ML and DL

Artificial intelligence (AI) is technology that enables computers and machines to simulate human learning, comprehension, problem solving, decision making, creativity and autonomy.
An Al system consists of an agent and its environment. An agent is an object (hardware or software) that can gather information about its environment and take decisions or actions based on the information.
Agents can be of several types, like agents, goal based, role based, utility based, and learning agents.



Machine learning (ML) is a field of computer science that gives computers the ability to automatically learn without being explicitly programmed.

Three broad categories of learning Supervised (contains data with labels), Unsupervised(contains data without labels), Reinforcement (Learns from interaction with the environment to achieve a goal).

Limitations of Traditional ML Systems Need human intervention to extract useful features for each specific task, features are application dependent.

Deep learning models learn rich hierarchical representations (features) automatically by extracting features at different levels. Provide a flexible learnable framework.

Types of Neural Networks

1)Multilayer Perceptron used for General purpose, many applications.

2)Convolutional Neural Networks Useful for image and video data.

3)Recurrent Neural Networks Useful for sequential data.

4)Generative Adversarial Networks For generative modeling.

5)Transformer networks Self-attention based for sequential data.

6)Vision transformers Useful for image /videos data.

Deep Learning Impact Everywhere

1) INTERNET & CLOUD: Image Classification, Speech Recognition, Language Translation, Language Processing, Sentiment Analysis, Recommendation.

2) MEDICINE & BIOLOGY: Cancer Cell Detection, Diabetic Grading, Drug Discovery.

3) MEDIA & ENTERTAINMEN: Video Captioning Video Search, Real Time Translation.

4) SECURITY & DEFENSE: Face Detection, Video Surveillance, Satellite Imagery.

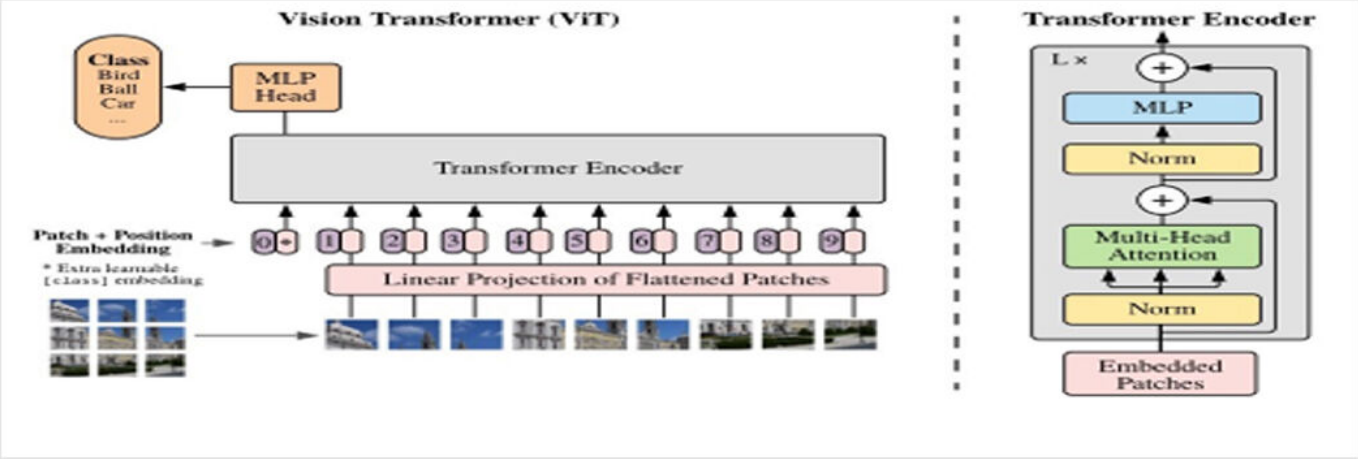
5) AUTONOMOUS MACHINES: Pedestrian Detection, Lane Tracking, Recognize Traffic Sign.

GenAl capabilities: Summarizing, Expanding, Chatbots, Inferring, Transforming.

Prof. Vasudha Sharma

Vision Based Transformer

Vision-based transformers are transforming how machines see the world. Originally designed for language tasks, transformers now rival traditional convolutional neural networks (CNNs) in image recognition and analysis. By using self-attention mechanisms, models like Vision Transformer (ViT) capture global features from images more effectively. New variants such as Swin Transformer and DeiT improve efficiency and accuracy, enabling applications in object detection, segmentation, and even video understanding. While they require significant data and computing power, ongoing innovations are making them more accessible. Vision transformers represent a powerful leap forward in AI-driven visual understanding.



Lokesh Baraskar

Data and Data Engineers

Data and Data Engineers – The Unsung Heroes of the AI Revolution

Introduction

Data is frequently referred to as the "new oil" in the current digital era since it is a potent resource that stimulates innovation, powers artificial intelligence (AI), and influences important choices in a variety of industries. However, raw data is worthless unless it is gathered, cleaned, and refined, much like crude oil. Data engineers are useful in this situation. They are the unseen power behind all intelligent dashboards, predictive models, and clever algorithms. Self-driving cars and social media apps that suggest content are examples of how data and data engineers quietly operate in the background to enable such wonders. The important role of both is examined in this essay.

Understanding Data: The Foundation of Intelligence

Technically speaking, data can be divided into three categories:

Texts, photos, videos, sensor readings, past purchases, medical records, and even emotions shared via chat applications are all examples of data.

1) semi-structured data (such as JSON, XML),
2) structured data (such as databases and Excel sheets), and
3) unstructured data (such as free-form text, audio, video, or photos).

Raw data, however, is frequently disorganized, lacking, redundant, or even deceptive. For AI and machine learning models to work effectively, high-quality, consistent data is necessary. For this reason, before data is used for analytics or training models, it must be cleaned, transformed, and integrated.

Who Are Data Engineers?

Data engineers are the designers and builders of the data universe, even though data scientists and AI engineers frequently receive the most attention.
One of the technical responsibilities of a data engineer is to design and construct data pipelines,
Overseeing databases and data lakes, as well as making sure that data moves securely and smoothly from its source to its destination.
Their efforts guarantee that the appropriate data is accessible in the appropriate format at the appropriate time, prepared for AI processing or analysis. Machine learning systems wouldn't have anything trustworthy to learn from without them.

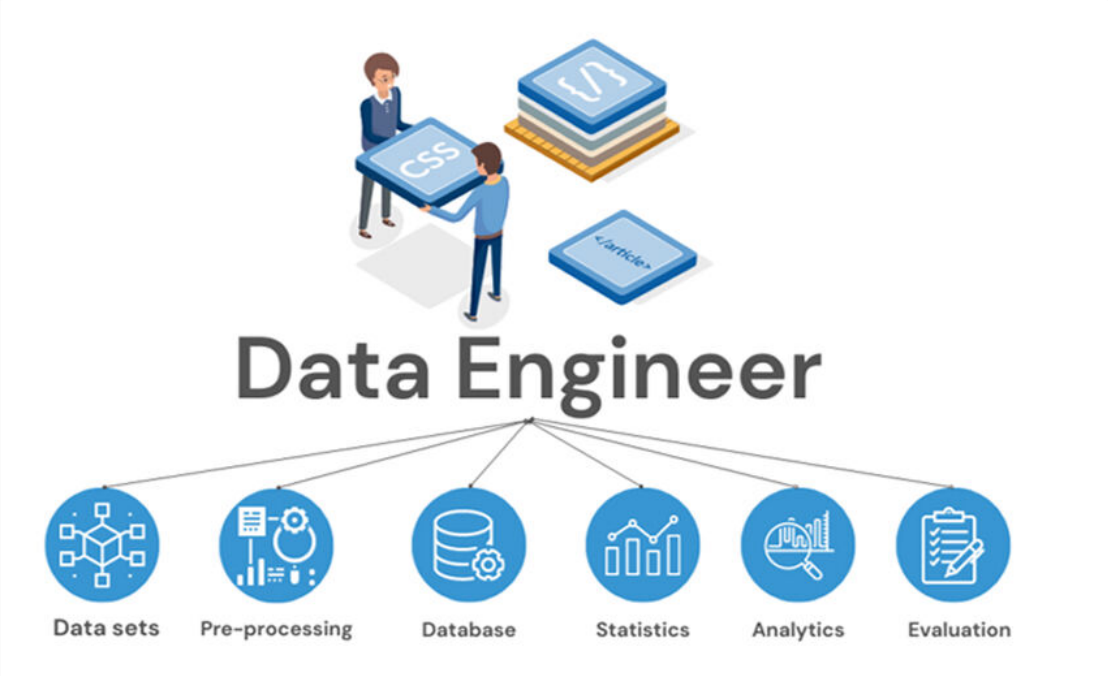
What Do Data Engineers Actually Do?

A data engineer's primary duties include the following:
ETL (Extract, Transform, put) pipelines are created by them to gather raw data from various sources, clean it up, and then put it into databases or data warehouses.

1) Tool & Platform Expertise: They deploy data systems on cloud platforms like AWS, GCP, or Azure and work with robust tools like Apache Spark, Airflow, Kafka, SQL, and Docker.

2) Data Modeling & Storage: They use format like Parquet, Avro, or Delta Late to organize data in ways that maximize dependability and speed of access.

3) Data Governance & Quality: They guarantee that data is secure, reliable, and comprehensive; otherwise, analytics or AI insights may be incorrect or harmful.



A Real-Life Analogy: The Netflix Example

Consider Netflix. Have you ever wondered how it suggests shows you might enjoy?

1) Every second, billions of data points are gathered, including what you view, when you pause, and what you skip.

2) Data engineers create reliable pipelines to gather and purify this data. Data scientists can use it to create recommendation models only after that.
The recommendation engine as a whole fail if the data is not timely or well-structured. Therefore, data engineers are the reason your favourite show comes up when you're browsing for it, even though you don't see their work.

The Future of Data Engineering

The need for qualified data engineers is growing rapidly as the world produces more than 328 million gigabytes of data everyday. Every industry, including healthcare, banking, gaming, and agriculture, requires experts who can handle the deluge of data.
The industry is becoming more fun and efficient thanks to emerging technologies like Apache Beam, Snowflake, dbt (data construction tool), and contemporary orchestration frameworks. Data engineering is now about creating scalable systems that drive AI's future, not just writing SQL.

Conclusion

Data is the gasoline in the realm of AI and ML, and data engineers are the ones that supply that fuel. They create the foundation that enables intelligent systems. Data engineers are quietly fuelling the change, whether it's through medical analytics, chatbot power, or weather prediction.
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Tanishq Chouhan

Article on Securo

Introducing Securo — My Solution to the Digital Privacy Crisis :

I'd like to introduce you to something I've been building: Securo — a unified platform designed to help people take control of their digital privacy.

We live in a time where our personal data is scattered across hundreds of websites, many of which have already been breached or compromised. Most people don't even realize how exposed they are—until it's too late. That's the problem I wanted to solve.

Why I Built Securo

I saw a gap: privacy tools were either too technical, too fragmented, or too passive. Some only tell you that you've been breached—but then what? Others are buried in complex interfaces or require you to jump between multiple apps just to stay somewhat protected.

So I asked myself: **What if there was one place where people could not only detect risks but also understand them, manage them, and take meaningful action—all without needing to be a cybersecurity expert?**

That's the idea behind Securo.

What Securo Helps You Do

Securo is built around real-world privacy challenges:

1)Know if your data is at risk – like breached emails, exposed passwords, or leaks on the dark web.
2)Secure your communication – with tools like disposable email addresses to stop spam and reduce tracking.
3)Store sensitive documents safely, without relying on traditional cloud providers.

4)Stay informed with a curated privacy feed so you're not left guessing what's going on in the security world.

5)And most importantly, **understand what actions to take**—with insights, not just alerts.

The Vision Behind It

My focus wasn't just on security. I wanted Securo to feel human. That meant:

1)Making the experience **intuitive and accessible** for everyone—not just tech-savvy users.

2)Bringing everything under one roof, so you're not juggling five different apps to stay protected.

3)Providing **guidance, not just data**—so users feel empowered, not overwhelmed.

Securo isn't just another privacy tool. It's built to be a trustworthy companion for anyone who cares about their digital footprint—whether you're new to privacy or already paying attention to your online safety.

Also, Here is the Deployed version of the "Securo" - https://securo-app-v0.vercel.app/ . Currently it was the Version 0 of secure further version will be introduced in future.

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