



The Institution of Engineers (India)
U.P. State Centre, Lucknow

AI in Action : From Concept to Reality

Technical Session 1

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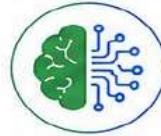
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ARTIFICIAL INTELLIGENCE – KEY TOPICS OVERVIEW

1	HISTORY OF AI	
2	AI FROM CONCEPT TO REALITY	
3	AI IN ACTION – IMPACTING DAILY LIFE	
4	WHY DO WE NEED AI?	
5	75 YEARS OF AI – KEY MILESTONES	
6	HOW AI ACTUALLY WORKS	
7	THREE WAYS AI LEARNS	
8	AI TODAY	
9	AI TRANSFORMING INDUSTRIES	
10	CHALLENGES OF AI	
11	RESPONSIBLE AI	
12	FUTURE OF AI	





HOW HUMANS LEARN



1. Experience

We do things



2. Learn

We understand
from experience



3. Improve

We get better
next time



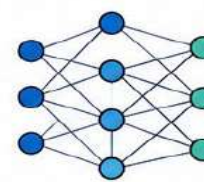
Knowledge comes from experience,
practice and mistakes.

HOW AI LEARNS



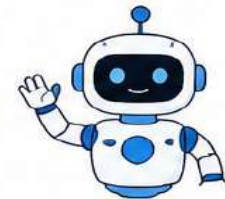
1. Data

Lots of data is
collected



2. Learn

AI finds patterns
in data



3. Predict / Decide

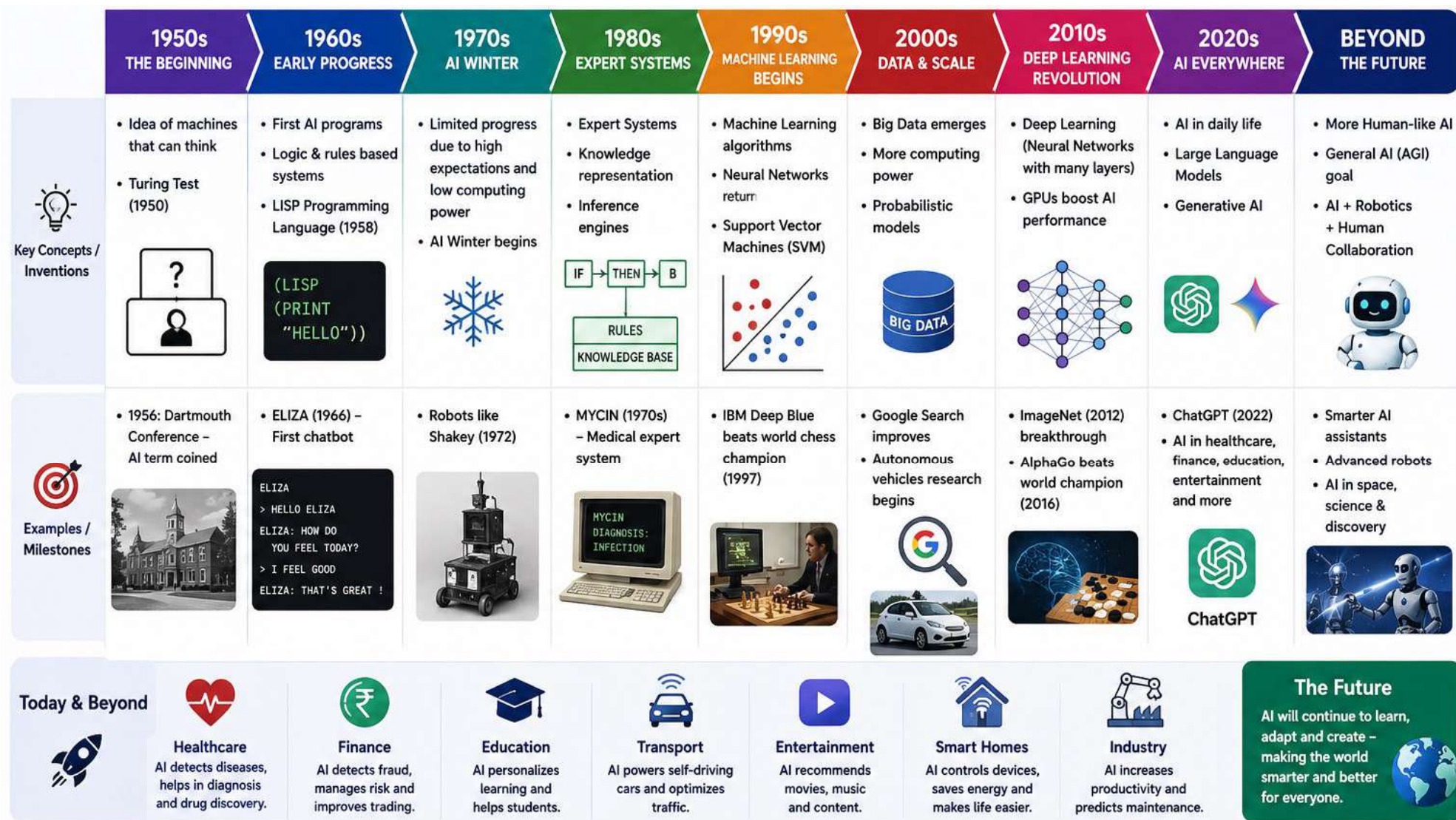
AI makes predictions
and gets better



Knowledge comes from data,
patterns and training.

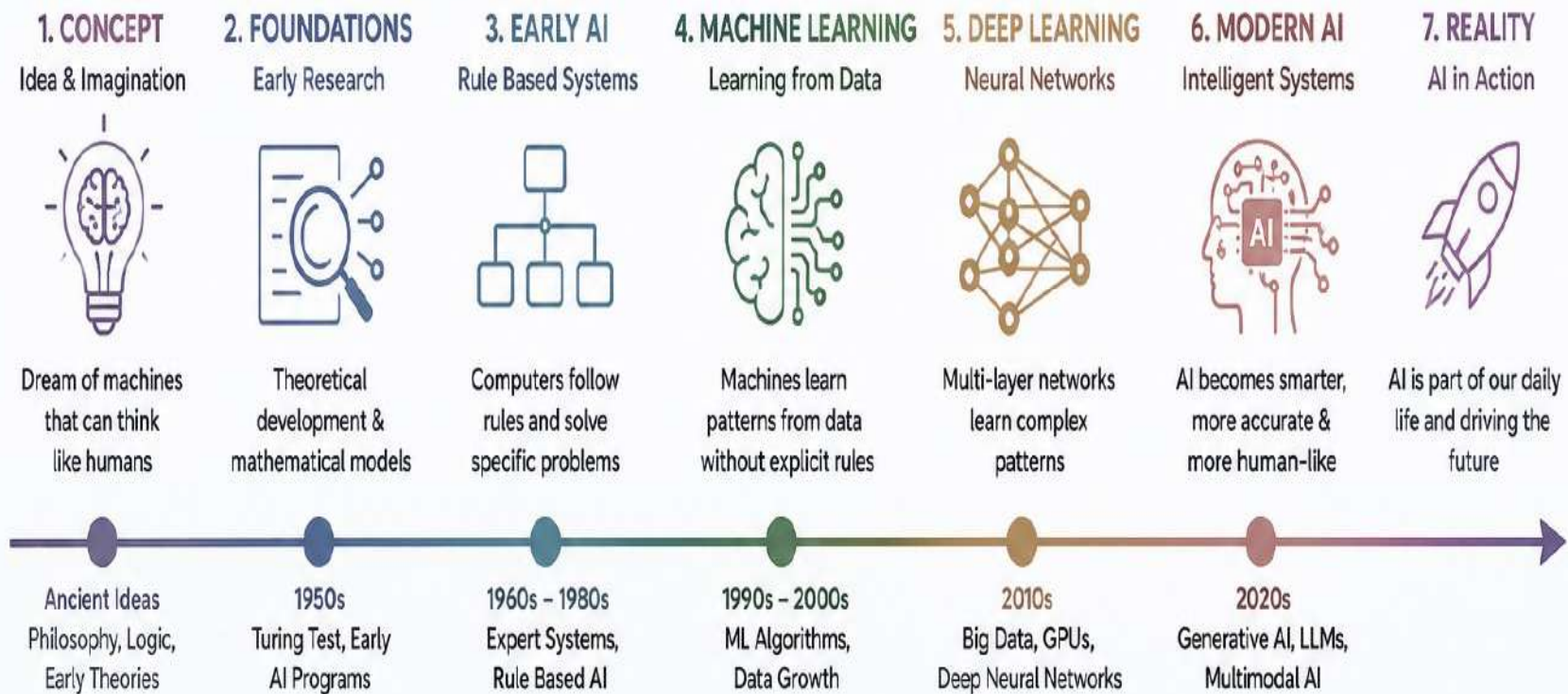
Data is the backbone of AI.





AI FROM CONCEPT TO REALITY

The Journey of Artificial Intelligence



AI IN ACTION – IMPACTING REAL LIFE



HEALTHCARE

Disease detection,
drug discovery,
patient care



TRANSPORTATION

Self-driving cars,
traffic optimization,
smart mobility



RETAIL & E-COMMERCE

Product recommendations,
chatbots, demand
forecasting



AGRICULTURE

Crop monitoring,
yield prediction,
smart farming



FINANCE

Fraud detection,
algorithmic trading,
risk analysis



EDUCATION

Personalized learning,
smart tutoring,
automated grading



CYBERSECURITY

Threat detection,
anomaly detection,
data protection



SMART LIFE

Voice assistants,
smart homes,
entertainment



THE JOURNEY CONTINUES...

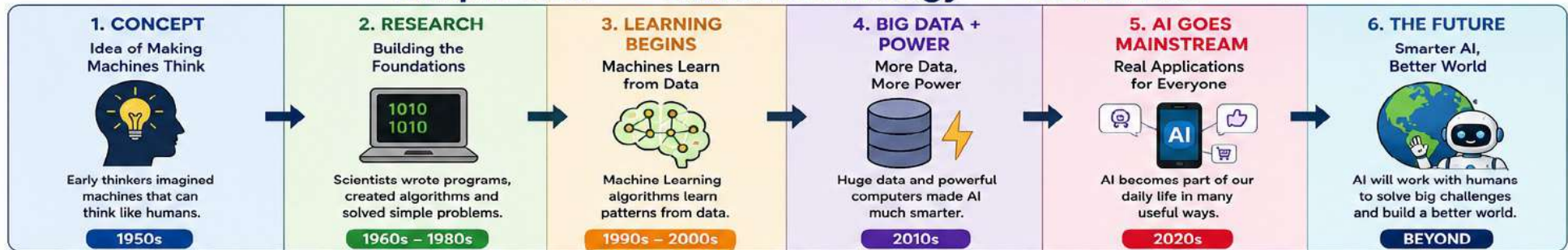
AI started as a concept and is now a reality.

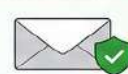
It is transforming the world and will continue to shape a better future
for humanity.



AI: FROM CONCEPT TO REALITY

Simple Idea → Smart Technology → Better Life



LIFE WITHOUT AI (Harder, Slower, Manual)			LIFE WITH AI (Easier, Faster, Smarter)		
	Spend a lot of time in libraries, read many books, hard to find the right information.	✗	 Search Information		Get the right information in seconds with search engines (Google, Bing). ✓
	Use paper maps, ask people, easy to get lost, takes more time and fuel.	✗	 Travel / Navigation		Get best routes, real-time traffic updates with Google Maps, saves time and fuel. ✓
	Receive spam, scams and unwanted emails in inbox, risk of fraud.	✗	 Email (Spam Filter)		AI filters spam and phishing emails and keeps inbox safe (Gmail, Outlook). ✓
	No recommendations, spend time choosing what to watch.	✗	 Entertainment (Shows / Music)		AI recommends shows and songs you like (Netflix, YouTube, Spotify). ✓
	Go to many stores, compare prices manually, may not get the best deal.	✗	 Shopping		AI suggests best products, prices, offers and delivers at your home. ✓
	Write everything manually, takes more time and can have mistakes.	✗	 Work / Writing		AI helps write, check grammar, summarize, translate and increase productivity. ✓
	Hard to detect frauds and threats, more risk to personal data.	✗	 Security		AI detects fraud, unusual activity and protects your data (Banks, UPI, etc.). ✓

AI IN REALITY EXAMPLES

-  Voice Assistants (Siri, Alexa)
-  Face Unlock on Phones
-  UPI Fraud Detection
-  YouTube Recommendations
-  ChatGPT Writing Assistant
-  Self-Driving Cars
-  AI in Healthcare (X-ray, Diagnosis)

AI is already in our lives and making them better every day!

AI doesn't replace humans, it **helps** humans.



SAVES TIME



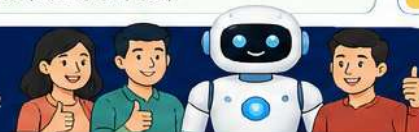
REDUCES EFFORT



IMPROVES ACCURACY

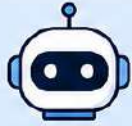
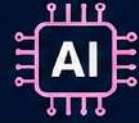


MAKES LIFE BETTER





Artificial Intelligence: Key Points



Artificial Intelligence (AI) is the science of making machines learn, think, and make decisions like humans.



Humans learn from experience and AI learns from data. Data is the backbone of AI.



From Single Idea in 1950s to a powerful reality today. Journey is far from over.



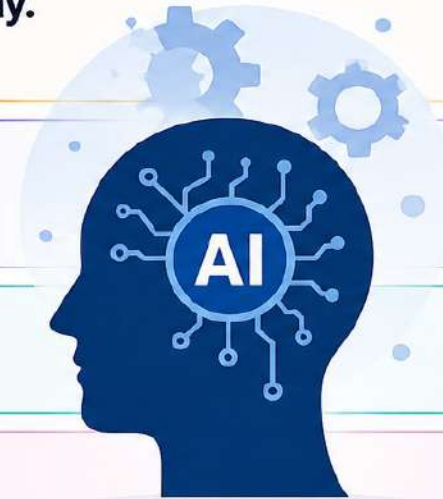
AI saves time, reduces effort and improves life. Making machines smart and smarter using data.



AI Improves automatically over time.



Best is yet to come.



Why Does the World Need AI?

Too Much Data

2.5 quintillion bytes
created every day

Example: AI detects cancer in X-rays at 94% accuracy



Need for Speed

Decisions needed
in milliseconds

Real example: GPS routes millions of cars in real-time

Better Accuracy

Human errors cost
lives and money

Example: Gmail filters 99.9% spam automatically



Finding Patterns

Millions of variables —
too complex for humans

Real example: AI finds fraud in 2 milliseconds per payment



Years of AI: Key Milestones



Turing Test — Alan Turing asks: Can machines think?

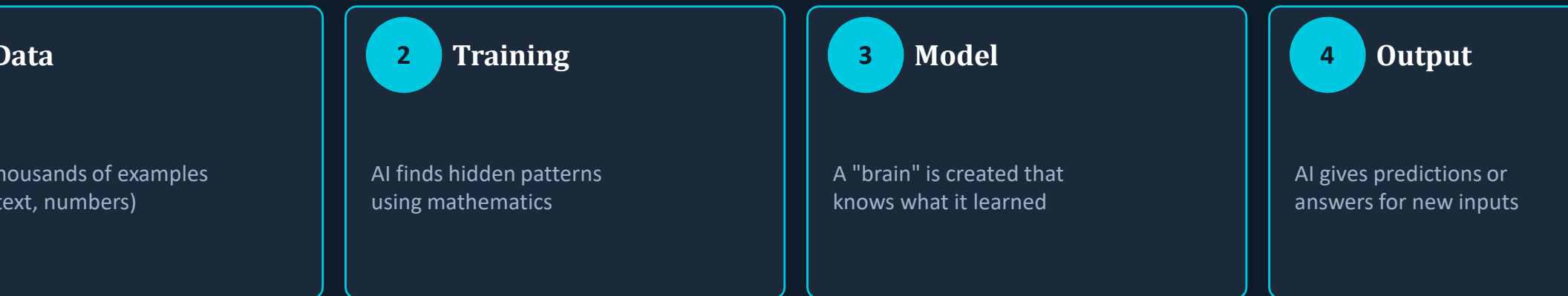
Deep Learning revolution — ImageNet breakthrough

1956 AI is officially born at Dartmouth Conference

2022 ChatGPT reaches 100M users in just 2 months



How AI Actually Works



Example: Show AI 10,000 dog photos → it learns "dog" → correctly identifies new dog photos it has never seen.



Three Ways AI Learns

Supervised



Labelled data

Prediction

Unsupervised



No labels

→ Clusters

Reinforcement



Reward/Penalty

→ Strategy

Real-Life Analogies

Supervised

Teacher shows 100 maths problems with answers → student learns

Unsupervised

Sort a pile of mixed fruits without being told what groups exist

Reinforcement

Video game — player tries moves, gets score, improves strategy



Today: The Generative AI Revolution

ChatGPT

by OpenAI

Writes, codes, explains anything



Gemini

by Google

Sees images + understands text



Claude

by Anthropic

Safe, thoughtful AI assistant

Copilot

by Microsoft

AI inside Word, Excel, Teams



Midjourney

by Midjourney

Creates stunning images from text



Sora

by OpenAI

Generates videos from descriptions

ChatGPT reached 100 million users in 2 months , the fastest any technology has ever grown in history.



s Already in Your Daily Life



Google Maps

Predicts traffic in real-time



Face Unlock

Recognizes your face in ms



Netflix

Suggests what you will enjoy



Gmail Spam

Filters 99.9% junk mail



UPI / Banks

Detects fraud instantly



Amazon

Recommends products for you



Alexa/Siri

Understands your voice



Smart Watch

Monitors your heart rate

The average person interacts with AI over 30 times a day — mostly without realizing it.



Transforming Every Industry



Healthcare

94%

AI cancer detection accuracy



Agriculture

30%

Crop yield increase with AI



Finance

\$32B

Fraud prevented by AI yearly



Transport

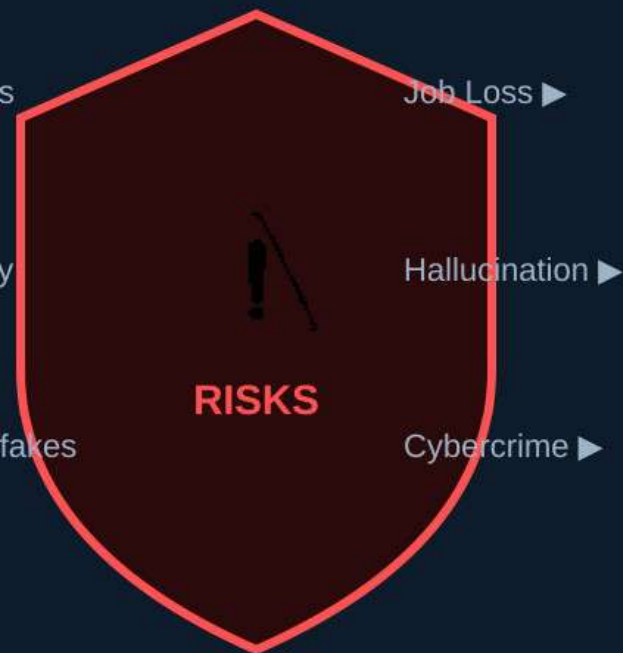
40B+

Autonomous miles driven

Every sector we work in — AI has arrived or is arriving very soon.



Challenges & Risks of AI



Bias & Unfairness

AI trained on biased data discriminates against people



Deepfakes

AI creates fake videos/voices indistinguishable from real



Job Displacement

300M repetitive jobs at risk globally by 2030



Hallucination

AI confidently states wrong facts as truth



Privacy Risk

Facial recognition and data used without consent



These risks are real — but they are solvable. Informed engineers and citizens are the solution.

Responsible AI: Building AI We Can Trust

Responsible AI Pillars



What Responsible AI Means:

- Transparency — AI must explain its decisions
- Fairness — No discrimination by gender, race, or caste
- Privacy — Your data cannot be used without consent
- Human Oversight — Critical decisions need human review
- Accountability — Someone must be responsible for AI errors

India's Response:

- IndiaAI Mission — ₹10,000 crore national AI program
- Bhashini — AI in all 22 Indian languages
- Digital Personal Data Protection Act 2023
- NASSCOM Responsible AI Principles



Engineers who build ethical AI will be the most valuable professionals of the next decade.

The Future of AI: What's Coming Next

Humanoid Robots

Tesla Optimus & Figure robots
already working in factories

Quantum AI

1000x faster calculations,
new materials & drugs

AI Scientists

AI discovers new drugs &
materials faster than humans

AI Education

Personal AI tutor for every
student in the world

Climate AI

Optimize energy, predict
disasters, fight climate change



Thank You!

Questions & Discussion

Message to Take Home:

- ◆ AI will not replace us. But someone using AI will
- ◆ The best time to start was yesterday. Start NOW.