

INTRODUCTION TO ARTIFICIAL INTELLIGENCE FOR YOUNGER GENERATION

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Outline

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About Me

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Bio:

- ▶ 20+ years in CAD/Engineering software development
- ▶ Got Bachelors, Masters and Doctoral degrees in Mechanical Engineering (specialization: Geometric Modeling Algorithms).
- ▶ Currently doing Coaching in fields such as Data Science, Artificial Intelligence Machine-Deep Learning (ML/DL) and Natural Language Processing (NLP).
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Welcome to the Amazing World of AI!

Artificial Intelligence Made Simple

AI is Like Having a Super Smart Friend Who Never Gets Tired!

What is AI?

- ▶ AI stands for Artificial Intelligence
- ▶ It's when computers and robots learn to do things that usually need human thinking
- ▶ Like recognizing your face to unlock your phone
- ▶ Or helping you find videos you'll love on YouTube
- ▶ Think of it as teaching machines to be smart!

AI in Your Daily Life

- ▶ **Video Games:** NPCs (Non-Player Characters) that play against you
- ▶ **YouTube:** Recommends videos you might like
- ▶ **Smartphone:** Face unlock, voice assistants like Siri/Google Assistant
- ▶ **Netflix:** Suggests shows based on what you watched
- ▶ **Spell Check:** Fixes your spelling mistakes automatically
- ▶ **Google Translate:** Converts languages instantly

Can you think of more examples?

How Does Learning Work?

How YOU Learn New Things

- ▶ Remember when you learned to ride a bicycle?
 - ▶ First time: You fell down (made mistakes)
 - ▶ Practiced more: Got better each time
 - ▶ After many tries: You can ride without thinking!
- ▶ Same with learning math, cricket, or dancing
- ▶ Practice + Mistakes = Learning!

How Computers Learn (Machine Learning)

- ▶ Computers learn the SAME WAY!
- ▶ Example: Teaching computer to recognize cats
 - ▶ Show 1000 pictures of cats
 - ▶ Show 1000 pictures of dogs
 - ▶ Computer finds patterns (whiskers, pointy ears, etc.)
 - ▶ Now it can tell cats from dogs in NEW pictures!
- ▶ This is called **Machine Learning** (ML)

Let's Understand with Simple Examples

Example 1: Ice Cream Sales

- ▶ **Simple Pattern:** When it's hot, more people buy ice cream
- ▶ **Relationship:** Temperature \uparrow = Ice cream sales \uparrow
- ▶ This is EASY to program with simple rules
- ▶ No AI needed!

Rule: IF temperature $> 30^{\circ}\text{C}$ THEN more ice cream will sell

Example 2: Video Game Player

- ▶ **Complex Pattern:** What's the best move in a chess game?
- ▶ Too many possibilities to write simple rules!
- ▶ Need to learn from MILLIONS of games
- ▶ AI can do this!

How? By playing games over and over, learning what works and what doesn't!

Example 3: Your Teacher vs AI Teacher

| Your Teacher | AI Teacher |
|------------------------------|----------------------------------|
| Teaches 40 students together | Can teach millions at once |
| Works 6-8 hours a day | Works 24/7, never tired |
| Knows you personally | Remembers what you struggle with |
| Can explain creatively | Gives same answer every time |
| Can see if you're confused | Can't see your face |

Best: AI helps teachers, doesn't replace them!

Types of AI - The AI Family

The AI Family Tree

- ▶ **Artificial Intelligence (AI):** The big family
 - ▶ Making computers smart
- ▶ **Machine Learning (ML):** A special member
 - ▶ Learning from examples (like the cat/dog pictures)
- ▶ **Deep Learning (DL):** The super smart cousin
 - ▶ Uses “artificial brain” with layers (like your brain has neurons!)
- ▶ **Generative AI:** The creative one
 - ▶ Can create NEW things: pictures, stories, music!
 - ▶ Example: ChatGPT, DALL-E

Three Ways Computers Learn

1. **Supervised Learning** (Learning with a teacher)

- ▶ Like learning with answer key
- ▶ Example: Showing labeled pictures - "This is a cat", "This is a dog"

2. **Unsupervised Learning** (Learning by yourself)

- ▶ Finding patterns without help
- ▶ Example: Grouping similar songs together on Spotify

3. **Reinforcement Learning** (Learning by trial and error)

- ▶ Learn by rewards and punishments
- ▶ Example: Game AI that gets points for winning

Cool Things AI Can Do!

Amazing AI Achievements

- ▶ **Games:** AlphaGo beat the world champion at Go (super complex game!)
- ▶ **Art:** AI creates beautiful paintings and music
- ▶ **Space:** Helps find new planets
- ▶ **Medicine:** Detects diseases from X-rays
- ▶ **Language:** Translates between 100+ languages instantly
- ▶ **Creativity:** Writes poems, stories, even movie scripts!

ChatGPT and Friends

- ▶ **ChatGPT:** AI that can chat, help with homework, write stories
- ▶ **DALL-E:** Creates pictures from your imagination!
 - ▶ “Draw a purple elephant riding a skateboard in space”
 - ▶ And it does it!
- ▶ **Voice Assistants:** Siri, Alexa, Google Assistant
 - ▶ Talk to them like friends
 - ▶ They understand and help

Fun Example: AI in Video Games

- ▶ Old games (1990s): Enemies move in fixed patterns
 - ▶ Boring after you learn the pattern
- ▶ Modern games: AI enemies learn YOUR style
 - ▶ If you always hide behind walls, they throw grenades
 - ▶ If you snipe from far, they flank you
 - ▶ Every game is different!
- ▶ This makes games more fun and challenging!

Is AI Dangerous? Should We Worry?

What Movies Show Us

- ▶ Movies show robots taking over the world
- ▶ Scary AI like in *Terminator*
- ▶ Is this real?

The Truth:

- ▶ Current AI is NOT like movies (yet!)
- ▶ AI today can't "think" for itself
- ▶ It only does what we train it to do
- ▶ Like a super smart calculator, not a thinking robot

Real Problems to Think About

Things to be careful about:

- ▶ **Privacy:** AI cameras everywhere - where's our privacy?
- ▶ **Fairness:** If AI is trained on biased data, it becomes biased
 - ▶ Example: Face recognition works poorly on dark skin (not fair!)
- ▶ **Cheating:** Using ChatGPT to do ALL your homework
 - ▶ You don't learn!
- ▶ **Fake Content:** AI can create fake videos (Deepfakes)
 - ▶ Hard to know what's real

How to Use AI Responsibly

- ▶ Use AI as a **helper**, not a replacement for learning
- ▶ Like using a calculator: Use it, but still learn math!
- ▶ **Good:** Ask ChatGPT to explain a concept differently
- ▶ **Not Good:** Copy-paste ChatGPT's essay for homework
- ▶ Always **verify** information from AI
- ▶ Think critically - don't believe everything AI says!

AI and Your Future!

Jobs When You Grow Up

Jobs AI might reduce:

- ▶ Repetitive tasks (like assembly lines)
- ▶ Simple data entry

NEW jobs AI creates:

- ▶ AI Trainers (teaching AI to be better)
- ▶ Robot Designers
- ▶ AI Ethics Officers (making sure AI is fair)
- ▶ Prompt Engineers (people who are really good at talking to AI!)

Best skills for the future:

- ▶ Creativity (AI can't match human imagination!)
- ▶ Critical Thinking
- ▶ Working WITH AI (not against it)

Careers in AI

- ▶ **Data Scientist:** Detective who finds patterns in data
- ▶ **Machine Learning Engineer:** Builds AI systems
- ▶ **AI Researcher:** Discovers new AI techniques
- ▶ **Robotics Engineer:** Makes physical robots
- ▶ **Game Developer:** Creates AI for video games

All these need: Math, Science, Coding, and Curiosity!

How Can YOU Start Learning AI?

Start Your AI Journey Today!

For Beginners (Your Age!):

- ▶ Play with Scratch (MIT) - visual programming
- ▶ Try Teachable Machine by Google
 - ▶ Train AI with your webcam in 5 minutes!
- ▶ Explore AI experiments: experiments.withgoogle.com
- ▶ Play chess against computer (watch it learn!)

As You Get Older:

- ▶ Learn Python programming (it's fun and easy!)
- ▶ Try Kaggle competitions (beginner-friendly)
- ▶ Build your own projects
- ▶ Follow cool AI YouTubers

Fun AI Projects You Can Try

- ▶ Build a Rock-Paper-Scissors AI
- ▶ Create a chatbot for your school project
- ▶ Make an AI that recognizes your handwriting
- ▶ Train AI to play Flappy Bird
- ▶ Build a spam message detector
- ▶ Create an AI artist that draws simple shapes

All these are possible with free tools online!

Cool Resources for Kids

Websites:

- ▶ Code.org - AI for Oceans course
- ▶ Scratch MIT - Visual programming
- ▶ Google's Teachable Machine

YouTube Channels:

- ▶ CrashCourse AI
- ▶ Two Minute Papers (amazing AI research explained!)

Apps:

- ▶ SoloLearn (learn coding on phone)
- ▶ Grasshopper (coding made fun)

Remember: The Future of AI

What's Coming Next?

- ▶ **Self-driving cars** will be common
- ▶ **AI doctors** helping in hospitals
- ▶ **Robot friends** that understand emotions
- ▶ **AI teachers** giving personalized lessons
- ▶ **Smart cities** that manage traffic, electricity automatically
- ▶ Maybe even **AI helping us explore Mars!**

You will grow up in an AI-powered world. Exciting, right?

The Most Important Things

AI is a **TOOL**, like a hammer or calculator

It's not good or bad by itself

What matters is **HOW WE USE IT**

YOU will decide how AI shapes the future!

Your AI Superpowers

Things AI can't do (but YOU can!):

- ▶ True creativity and imagination
- ▶ Understanding feelings and emotions
- ▶ Making ethical decisions
- ▶ Asking “why?” questions
- ▶ Caring about others
- ▶ Having dreams and aspirations

AI is powerful, but **human beings are irreplaceable!**

Questions to Think About

Think and Discuss

- ▶ If you could teach AI to do ONE thing, what would it be?
- ▶ Can AI be your friend? Why or why not?
- ▶ Should robots have rights?
- ▶ What's one thing AI should NEVER be allowed to do?
- ▶ How would YOU use AI to help make the world better?

Discuss these with friends, family, and teachers!

The End

Now go explore the amazing world of AI!

Remember: Stay curious, keep learning, and use AI responsibly!

Quick Summary

- ▶ AI = Making computers smart
- ▶ Machine Learning = Learning from examples
- ▶ AI is everywhere: games, phones, YouTube
- ▶ AI learns like you do: through practice
- ▶ Use AI as a helper, not for cheating
- ▶ Future has many AI jobs
- ▶ YOU can start learning AI today!
- ▶ Humans are still special and irreplaceable

References

Many publicly available resources have been refereed for making this presentation. Some of the notable ones are:

- ▶ “What counts as artificially intelligent? AI and deep learning, explained” - The Verge
- ▶ “Artificial Intelligence Overview” - Harry Surden
- ▶ “8 ways artificial intelligence is going to change the way you live, work and play in 2018” - Catherine Clifford
- ▶ “Artificial intelligence and the future of our work” - UNDP , IBM Research

Thanks ...

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