

Introduction to Artificial Intelligence

AI



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What is Artificial Intelligence?

- Any thoughts?
- This is an “AI’s” definition: *AI refers to machines or computers that can "think" and perform tasks that usually require human intelligence. These tasks include things like learning, reasoning, and even problem-solving.*
- So, based on that definition, then we haven’t achieved AI yet. Arguably, learning is the one task current AI software can perform.

What is the Current State of AI?

- If I were to define AI in its current state:
 - *“AI is a computer algorithm that can provide human-like responses to questions or tasks drawn from training data.”*
 - In other words, the AI can only respond based on information it has been given by humans. It is a very advanced Google search in many ways.

What AI Can't Do (yet)

- Reason/exhibit common sense
- Problem-solve outside the bounds of its training
- Imagine/independently create
- Express emotions/empathy
- Ethical and moral decision making
- Apply knowledge learned for one application to another situation
- Intuition
- Basically, everything that makes us human



What AI Can Do

- Draw from a wealth of information developed by humans to:
 - Answer questions using human language
 - Create detailed responses given a subject (write an essay, for example)
 - Be “creative”: write a fictional short story, write a recipe given a theme and/or ingredients, write a poem, create a “work of art” (in the style of a master if that’s what you ask). And more.
 - Hmm.. that seems counter to what I just said AI can’t do...

Where is AI Going?

- The holy grail of AI is called Artificial General Intelligence (AGI).
 - Computers that can reason
 - Computers that have “common sense”
 - Computers that can independently create
 - Computers that truly learn and can apply knowledge to diverse situations
 - Computers that can show emotion and empathy and make moral decisions
- Is this even possible?
 - Some say yes, some say no.
 - For those that say yes, the time range for when it can be realized

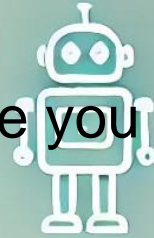


How/Where is AI Used Today?

- Thoughts?
- Here are some common applications of AI; some you have probably already used:
 - Voice assistants (Siri, Google assistant, Alexa)
 - Amazon shopping (home screen tailored for you)
 - Google Maps and other mapping programs
 - Self-driving cars
 - Language translation
 - Automated customer service
 - Healthcare (although some doctors may not admit it)
 - Grammarly

AI

AI



Some Possible Game-Changing Applications

A central graphic with a light blue background. It features the letters 'AI' in a large, white, sans-serif font. Below the 'AI' is a white outline of a human brain with a network of white lines and dots representing neural connections. To the right of the brain is a small, white, stylized robot with a square head and a rectangular body. The entire graphic is set against a background of faint, glowing circuit lines and nodes.

- Healthcare: Telehealth/telemedicine conducted by an AI with a physician monitoring.
- TeleLaw: AIs can analyze cases and bring up case law in milliseconds.
- Education: AIs can be programmed with lesson plans and even personalities to engage students.
- Job automation: Of course this is already happening. People will need to adapt to a changing workforce landscape.
- Robots

What Are Some Concerns?

- Thoughts?
- Aforementioned job automation
- Privacy: AI is all about the data. And if you want an AI to diagnose you or advise you in a law matter, it will need your information.
- Bias: This is a big one in my opinion. An AI's answers are only as good as its training data.
 - **Be skeptical!**
- Over-reliance: People will get lazy? Stop thinking for themselves? Stop creating?

Some AI Tools You Can Use Now

- ChatGPT: General purpose AI (chatgpt.com)
- CopyAI: An AI writing tool (copy.ai)
- Grammarly: A writing assistant (grammarly.com)
- AI Writer: An education and marketing focused AI writer (ai-writer.com)
- Midjourney: Image generator (midjourney.com)
- Synthesia: Video creator, avatars (synthesia.io)
- Plantly: Plant care assistant (<https://chatgpt.com/g/g-6PKrcgTBL-plantly>)
- Canva: Logos, social media posts (canva.com)
- Logo Creator: Self-explanatory (<https://chatgpt.com/g/g-gFt1ghYJI-logo-creator>)
- And many many more...



Let's Try Some AI!

- First, what are your questions?
- Let's see just how smart an AI can be.
- Who wants to create a graphic image? Realistic or cartoonish or something in between.
- Who is a gardener? Want advice on plants?
- Who likes to cook?
- Who wants travel ideas?

Some Techy Details



- How is something like ChatGPT created?
- GPT means Generative Pre-trained Transformer.
- It is a Large Language Model (LLM) and uses Natural Language Processing (NLP) and deep learning, with Transformer architecture

Some Techy Details (cont'd)

Five Steps to creating a ChatGPT:

1. Data Collection and Preprocessing

Gather a massive dataset containing text from diverse sources (e.g., books, articles, websites).

Clean and preprocess the text (e.g., remove special characters, normalize case, and tokenize sentences/words).

2. Model Architecture Selection

Choose an architecture suitable for NLP tasks, typically a transformer-based model (e.g., GPT, BERT).

The architecture uses self-attention mechanisms to understand the context of words and sentences.

Techy Details (cont'd)

3. Training the Model

Train the model on the preprocessed data using large-scale hardware (GPUs/TPUs) and distributed computing.

The model learns to predict the next word or token in a sequence, optimizing parameters to minimize prediction errors.

4. Fine-tuning

After the initial training, fine-tune the model on more specific datasets or tasks (e.g., question answering, summarization).

Apply techniques like reinforcement learning (RL) or supervised fine-tuning for specific behaviors or improvements.

Techy Details (cont'd)

5. Evaluation and Testing

Evaluate the model's performance using benchmarks and test datasets.

Adjust hyperparameters or use techniques like regularization to prevent overfitting and improve accuracy.

6. Deployment and Monitoring

Deploy the model to production environments with scalability and monitoring systems in place.

Continuously monitor for performance issues, biases, and updates based on user interactions and feedback.

