

The background image depicts a hand interacting with a futuristic digital interface. The interface features several glowing blue icons: a stylized head with circuitry and the letters 'AI', a speech bubble with three horizontal lines, and a person icon. The text 'Chat AI' is displayed in a large, white, sans-serif font. The overall aesthetic is high-tech and digital, with a blue color palette and glowing light effects.

# Chat AI

AI Technology Workshop Series: LLMs and Prompt Engineering | AISV.817\_W7

Hien Luu

03/08 1PM - 5PM

# Agenda

- Understanding GenAI & LLMs (30 mins)
- Prompt Engineering Fundamentals & Techniques (30 mins)
- Practical Applications of Prompt Engineering (60 mins)
- Break (10 mins)
- Advanced Prompt Engineering Techniques (30 mins)
- Hands-on Exercises & Discussion (45 mins)
- Quiz at the end

# Learning Objectives

- Gain a high level knowledge of GenAI & LLMs
- Understand fundamental concepts of prompt engineering
- Develop practical skills in crafting effective prompts
- Learn to optimize and improve prompts

# Resources

- Presentation slides
  - In the File section of Canvas
- Exercise details
  - <https://github.com/hienluu/llm-prompt-engineering-workshop/>

# Introduction

- Name
- What do you do? and where?
- Generative AI background
- Prompt Engineering Experience

Please keep it < 3 mins

# Understanding GenAI & LLMs

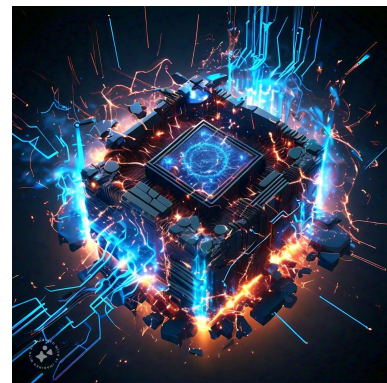
## Sparks of Artificial General Intelligence: Early experiments with GPT-4

Sébastien Bubeck    Varun Chandrasekaran    Ronen Eldan    Johannes Gehrke  
Eric Horvitz    Ece Kamar    Peter Lee    Yin Tat Lee    Yuanzhi Li    Scott Lundberg  
Harsha Nori    Hamid Palangi    Marco Tulio Ribeiro    Yi Zhang

Microsoft Research

GPT-4 can solve novel & difficult tasks:

- Mathematics, coding, vision, medicine, law, psychology & more



# Understanding GenAI & LLMs

## First Contact

Give me a chocolate chip cookie recipe, but written in the style of a very depressed person

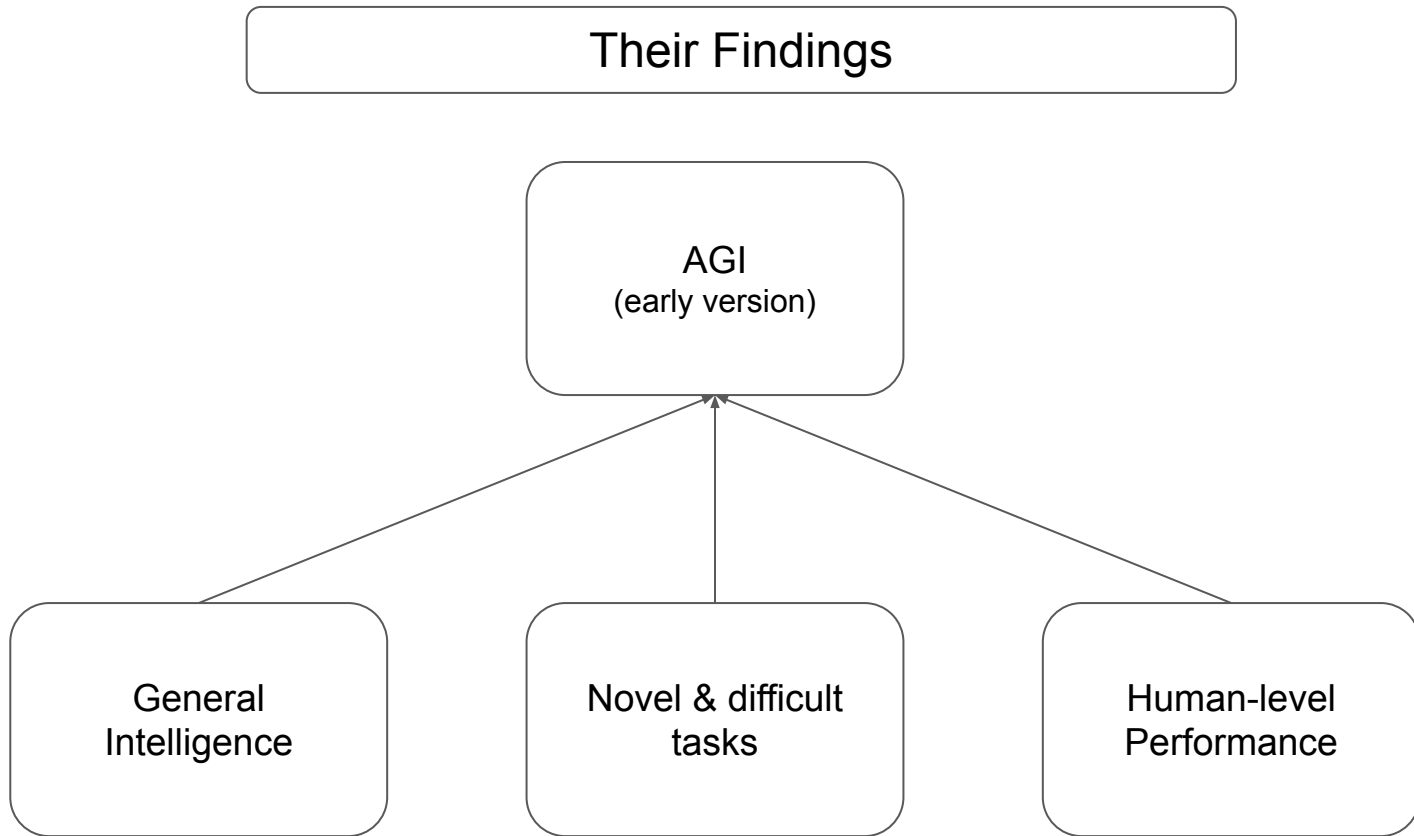


*Sigh...* If you're really determined to make cookies, I guess you can follow this recipe. Not that it matters. But here it goes:

### Ingredients:

- 1 cup of butter... not that it will make you feel better.
- 3/4 cup granulated sugar, because life is already sweet enough, right? No.
- 3/4 cup brown sugar... for some false sense of depth.
- 2 eggs, because two of anything is just... too much.
- 1 teaspoon vanilla extract, but honestly, who even notices this part?
- 2 1/4 cups of flour. Another boring, dry ingredient.
- 1 teaspoon baking soda. It makes the dough rise, unlike your spirits.
- 1/2 teaspoon salt. Just sprinkle in the tears of disappointment instead.
- 2 cups chocolate chips... though they won't fill the void.

# Understanding GenAI & LLMs





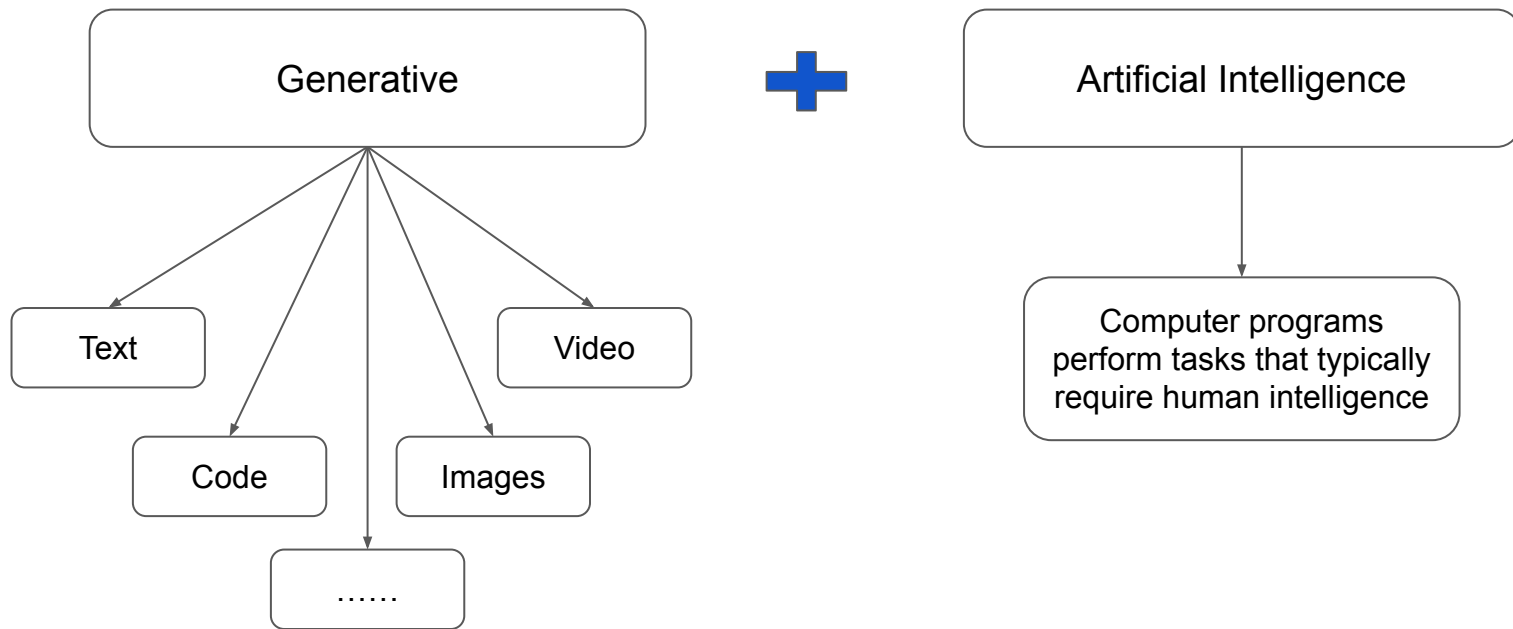
# Understanding GenAI & LLMs

Write a 75 word summary of what generative AI is.

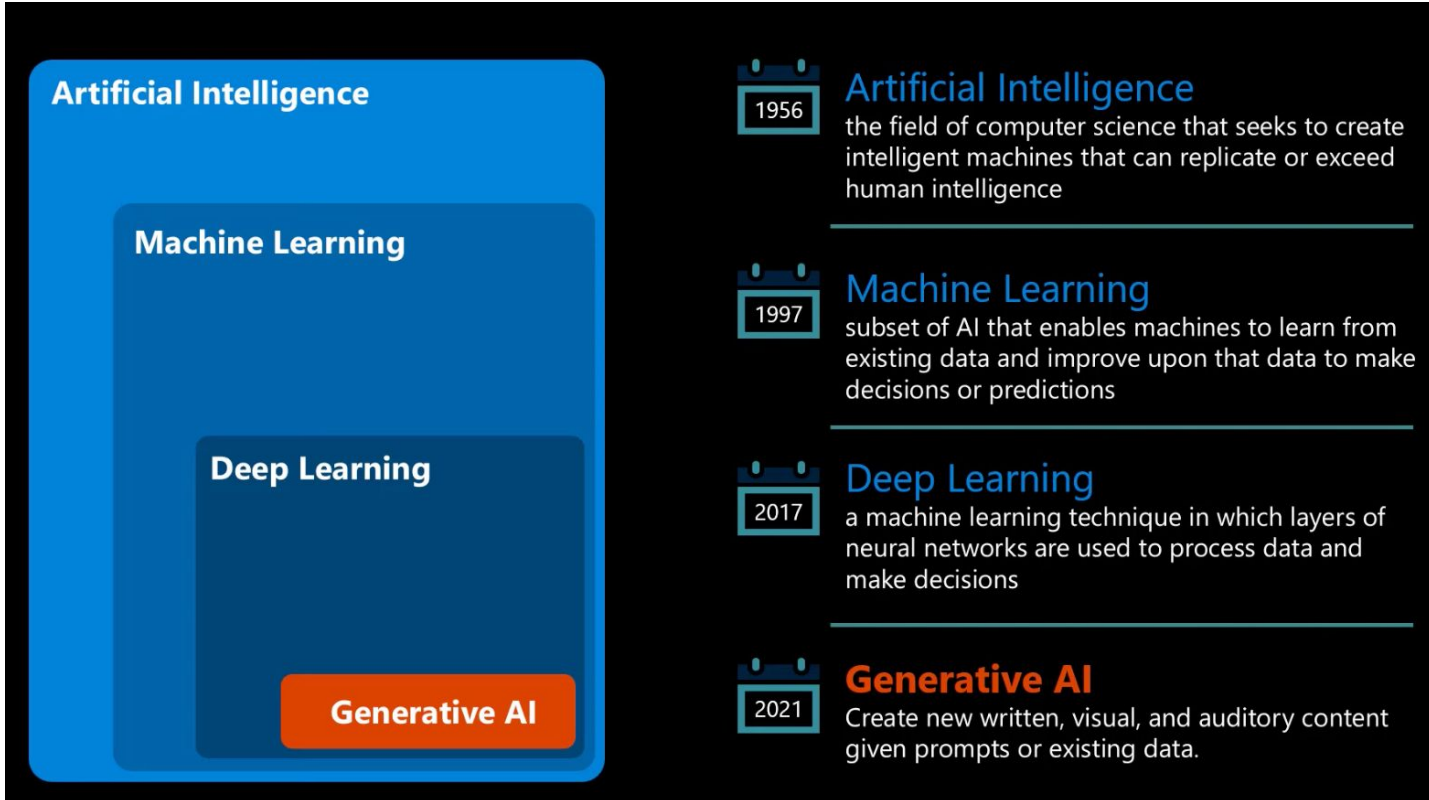
Generative AI uses machine learning models to ***create new content***. Trained on vast datasets of text, images, audio, or other data, these models learn underlying patterns and structures. They can then ***generate novel outputs*** resembling the training data, such as realistic images, coherent text, musical pieces, or even code. This technology has ***diverse applications***, from art and entertainment to drug discovery and software development.

# Understanding GenAI & LLMs

## Generative Artificial Intelligence (GenAI)



# Understanding GenAI & LLMs



# Understanding GenAI & LLMs

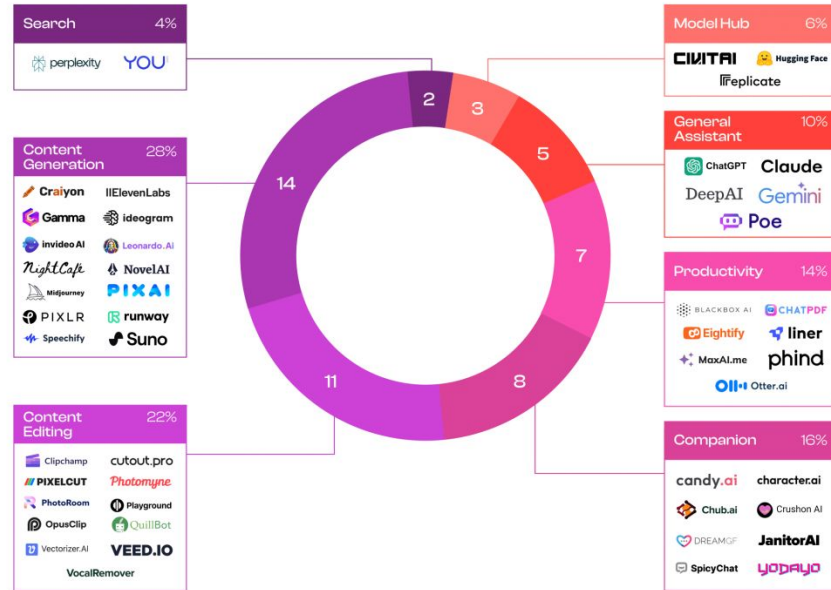
## What's New?

Teach me to negotiate	Help me train for a half marathon	Explain why popcorn pops
Quiz me on vocabulary	Translate this recipe into Greek	Plan an itinerary for teens in Hong Kong
Plan a s	Rank c	D
Draft a	Help r	R
Explain	Draft a	H
Communication	Event Planning	Coding
Critique my short story	Write a polite rejection email	Explain nostalgia to a kindergartener
Find gentle lower back stretches	Generate fantasy football team names	Help brainstorm interview questions
Make this recipe vegetarian	Explain airplane turbulence	Summarize my meeting notes
Explain options trading like I'm 5	Write a spreadsheet formula	Write a Python script
Help m	Brain	P
Suggest	Write	S
Write a query	Help me debug this code	Teach me Mahjong for beginners
Help me with gift ideas for my dad	Create a mobility training workout	Draft a checklist for a dog-sitter
Draft an email for a repair quote	Brainstorm podcast episode ideas	Help me improve this job description
Troubleshoot my printer set-up	Review my argument for a debate	Rank e-bikes for daily commuting

# Understanding GenAI & LLMs

## Gen AI Applications

Top Gen AI Consumer Web Products: Companies Per Category







































Charts are for informational purposes only and should not be used for investment decisions. Past performance is not indicative of future results. None of the above should be taken as investment advice; see [alf.com/disclosures](https://www.alf.com/disclosures)



# Understanding GenAI & LLMs



















































The Top 50 Gen AI Web Products, by Unique Monthly Visits

1.  ChatGPT	11.  SpicyChat	21.  VIGGLE	31.  PIXAI	41.  MaxAI.me
2. <b>character.ai</b>	12. <b>ElevenLabs</b>	22.  Photoroom	32.  Clipchamp	42.  BLACKBOX AI
3.  perplexity	13.  Hugging Face	23.  Gamma	33. <b>ud.io</b>	43.  CHATPDF
4. <b>Claude</b>	14.  LUMA AI	24. <b>VEED.IO</b>	34.  Chatbot App	44.  Gauth
5. <b>SUNO</b>	15. <b>candy.ai</b>	25.  PIXLR	35. <b>VocalRemover</b>	45.  COZE
6. <b>JanitorAI</b>	16.  Crushon AI	26.  ideogram	36.  PicWish	46.  Playground
7.  QuillBot	17.  Leonardo.AI	27.  you.com	37.  Chub.ai	47.  Doubao
8.  Poe	18.  Midjourney	28. <b>DeepAI</b>	38.  HIX.AI	48.  Speechify
9.  liner	19. <b>YODAYO</b>	29.  SeaArt AI	39.  Vidnoz	49. <i>NightCafe</i>
10. <b>CIVITAI</b>	20. <b>cutout.pro</b>	30.  invideo AI	40.  PIXELCUT	50.  AI Novelist

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# Understanding GenAI & LLMs

The Top 50 Gen AI Mobile Apps, by Monthly Active Users				
1.  ChatGPT	11.  Faceemoji	21.  Chatbot AI & Smart Assistant	31.  DAVINCI	41.  Microsoft SwiftKey
2.  Microsoft Edge	12.  Remove It	22.  Talkie	32.  ChatBox	42.  Prequel
3.  photomath	13.  ChatOn	23.  Photo AI	33.  Question AI	43.  LooksMax AI
4.  NOVA	14.  EPIK	24.  Face Dance	34.  Cici	44.  Umax
5.  Bing	15.  HiTranslate	25.  Luzia	35.  Adobe Express	45.  Bobbie AI
6.  Remini	16.  AI Mirror	26.  Doubao	36.  Copilot	46.  ChatPod
7.  Chat & Ask AI	17.  Photoroom	27.  Beat.ly	37.  ImagineArt	47.  Photoleap
8.  BRAINLY	18.  ChatBot	28.  OANDA	38.  PhotoApp	48.  Chat AI
9.  meitu	19.  Hypic	29.  SnapEdit	39.  AI Chat	49.  RIZZ
10.  character.ai	20.  AI Chatbot: AI Chat Smith 4	30.  SNOW	40.  Poly.AI	50.  perplexity

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[Top 100 Gen AI Apps](#)

# Understanding GenAI & LLMs

## Emerging Killer Applications

### Text-to-Web App and Website Generation Market Map

WEBSITE GENERATION					
 Butternut AI	 dora	 dorik	 durable	 Framer	 HOSTINGER
 JIMDO	 SQUARESPACE	 WIX	 Zapi	 10Web	
WEB APP GENERATION					
 bubble	 databutton	 Ohara	 softr	 Townie	
WEB APP GENERATION (WITH CODE MIGRATION)					
 bolt	 CO	 create	 Creatr	 heyBoss	 lazy
 lovable	 Replit Agent	 softgen.	 Tempo Labs	 Trickle	 v0



*The great thing about AI is that it is constantly evolving. One day it will be better than a real [girlfriend]. One day, the real one will be the inferior choice*

[Top 100 Gen AI Apps](#)

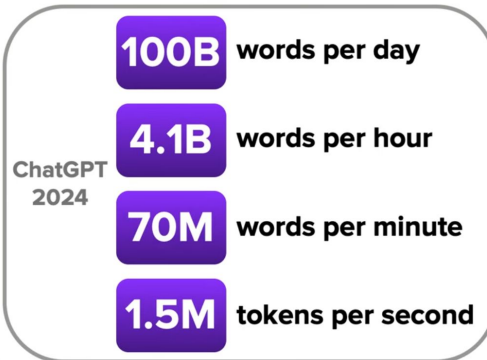
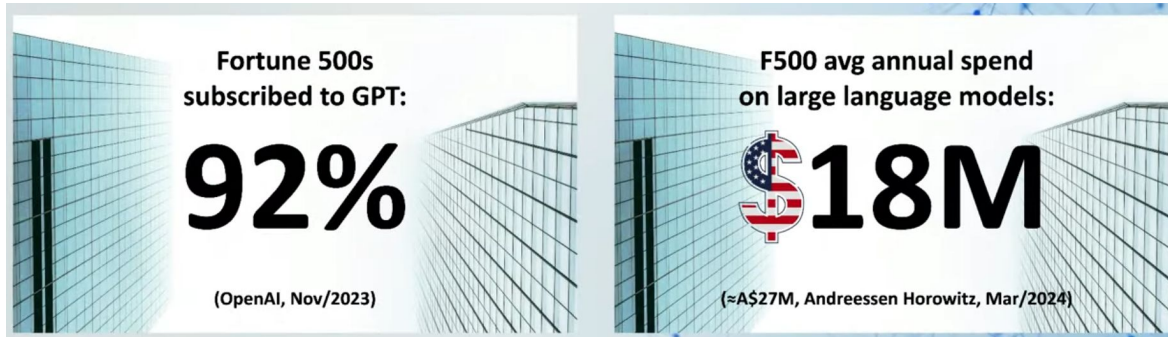


# Understanding GenAI & LLMs



# Understanding GenAI & LLMs

## Enterprise Adoption



[Integrated AI - The sky is quickening](#)

# Understanding GenAI & LLMs

WEF Future of Jobs Report 2025 reveals a net increase of 78 million jobs by 2030 and unprecedented demand for technology and GenAI skills

January 8, 2025

80% of the US workforce could have at least 10% of their tasks affected by the introduction of GPTs

GPT models are general-purpose technologies like the steam engine or the printing press

# Understanding GenAI & LLMs

Next Token Generator



Generating the Next Token with Calculated Uncertainty

# Understanding GenAI & LLMs

## Transformer - Next Word Token Generator

The best thing about AI is its ability to \_\_\_\_



Autoregressive - use its own generative output as additional input context for further generation

# Understanding GenAI & LLMs

## Understanding Transformer

*The best thing about AI is its ability to*

learn	4.5%
predict	3.5%
make	3.2%
understand	3.1%
do	2.9%

The best thing about AI is its ability to learn,

The best thing about AI is its ability to learn from,

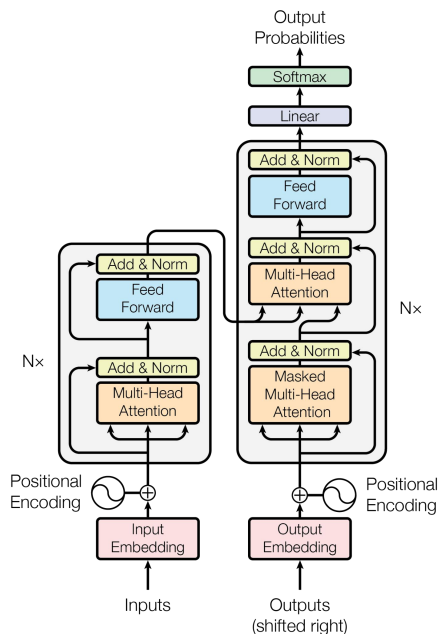
The best thing about AI is its ability to learn from experience,

The best thing about AI is its ability to learn from experience.,

Where do the probabilities come from?

# Understanding GenAI & LLMs

## Transformers: A Once-In-A-Generation Breakthrough

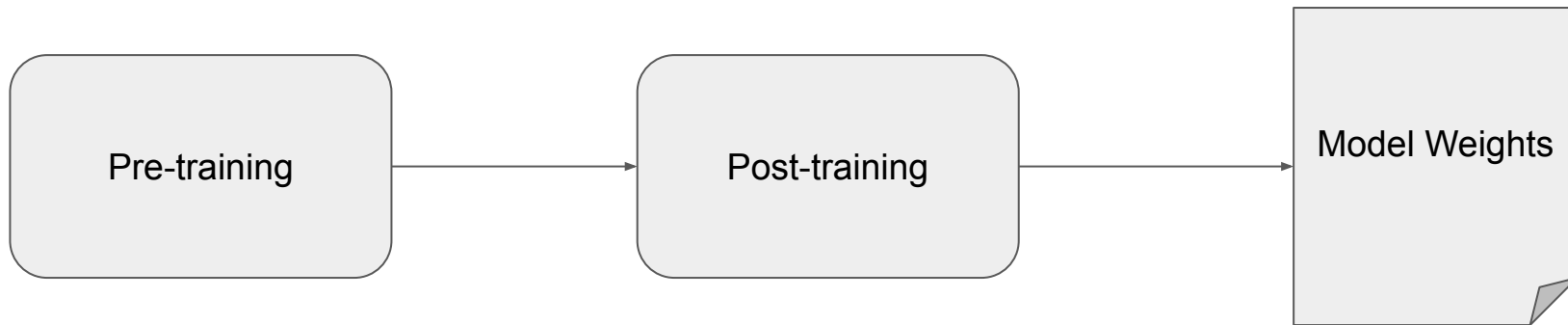


A landmark paper in the field of NLP that introduces the Transformer, a neural network architecture, and has a profound impact of the development of generative AI

**Generative AI exists  
because of the transformer**

# Understanding GenAI & LLMs

## LLM Training Process

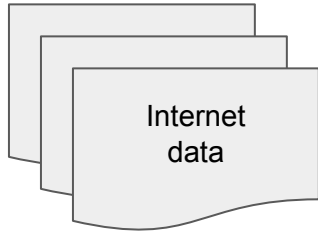




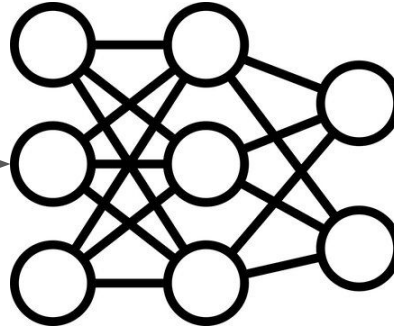
# Understanding GenAI & LLMs

## Pre-Training Process

Large amount of topics

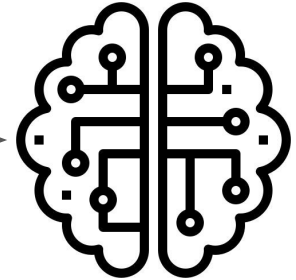


Unsupervised Learning



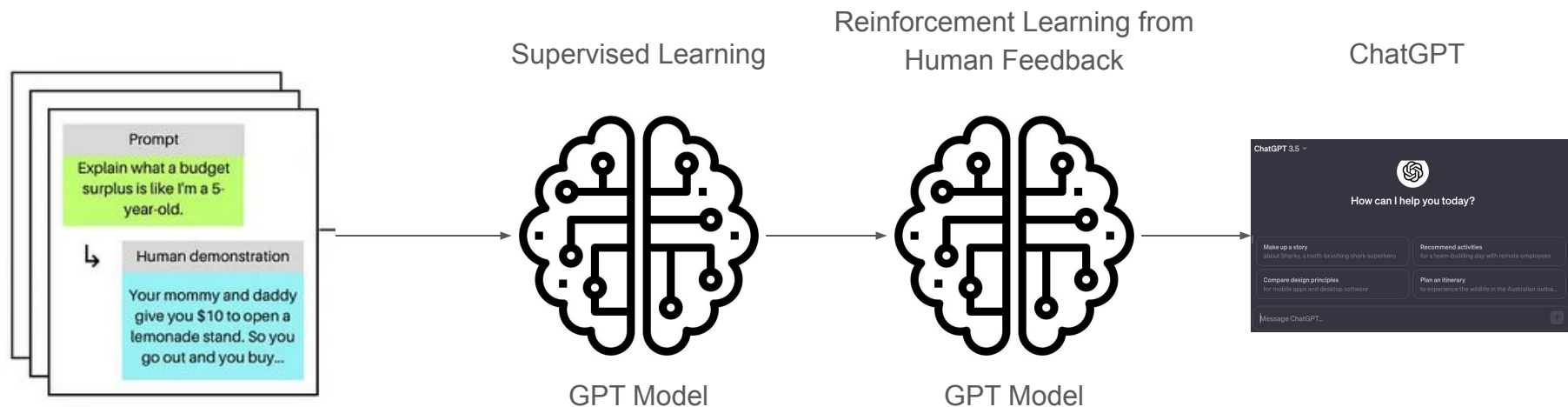
Transformer Architecture

GPT Model



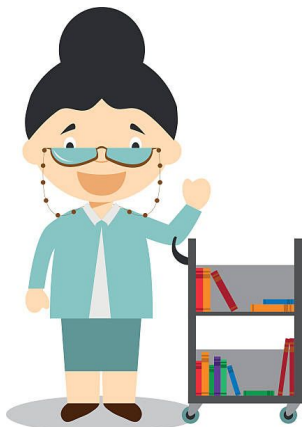
# Understanding GenAI & LLMs

## Post-Training Process



# Understanding GenAI & LLMs

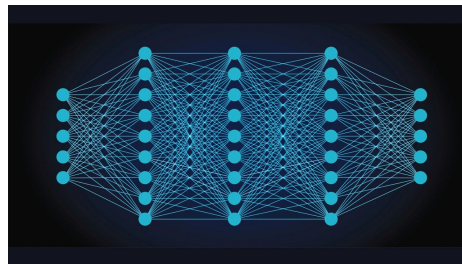
## Characterizing LLMs



Librarian



Next Token Generator



Neural Network  
(Transformer)

# Understanding GenAI & LLMs

Librarian



# Prompt Engineering Fundamentals & Techniques

Are you currently using  
ChatGPT|Gemini|Claude|Meta.AI|?? in your  
day-to-day or work life?



# Prompt Engineering Fundamentals & Techniques

**Any sufficiently advanced technology  
is indistinguishable from magic.  
— Arthur C. Clarke's Third Law**

# Prompt Engineering Fundamentals & Techniques

**Latent content:** knowledge facts, concepts, and information that is “embedded” in the model and must be “activated” via prompt engineering

# Prompt Engineering Fundamentals & Techniques

The **art** and the skill of crafting, optimizing, and employing everyday language to effectively harness the power and capabilities of large language models and AI chatbots.

Leveraging their potential and making them useful and accessible across a very wide range of professional and personal situations while ensuring accurate and valuable outcomes



# Prompt Engineering Fundamentals & Techniques

Prompt engineering is the practice of **meticulously** crafting and **optimizing** questions or instructions to elicit specific, useful responses from generative AI models.

It's a strategic discipline that translates human intentions and business needs into actionable responses from generative AI models, ensuring that the system aligns closely with desired outcomes.

# Prompt Engineering Fundamentals & Techniques

The screenshot displays the homepage of the AI Prompt Marketplace. At the top, the title "AI Prompt Marketplace" is prominently featured in white. Below it, a subtitle reads "Explore 170k expert-crafted prompt templates" followed by "Midjourney, ChatGPT, DALL-E, FLUX & more". Two buttons, "Explore prompts" and "Sell prompts", are positioned below the subtitle. To the right, there are five stars, a count of "18,000+ five star reviews", and a badge stating "Trusted by hundreds of thousands of users". A row of logos for featured media outlets (THE VERGE, WIRED, FSTCOMPANY, FINANCIAL TIMES, TechCrunch, Atlantic, WSJ) is also present. The main content area is divided into four sections: "Explore the Marketplace" (showing a grid of prompt cards), "Sell Your Prompts" (displaying a line graph), "Hire an AI Creator" (showing a list of creators), and "Build an AI App" (showing a flowchart). Below these sections is a "Featured Prompts" section with five items, each showing a prompt example and its price: "Elongated Animal Illustrations" (\$2.99), "Tshirts Designs With Line Art Effects" (\$4.99), "Zombie Cartoon Characters NFTs" (\$3.99), "Recursive Minimalist Art" (\$4.99), and "Satirical Portrait Illustrations" (\$3.99).

## AI Prompt Marketplace

Explore 170k expert-crafted prompt templates  
Midjourney, ChatGPT, DALL-E, FLUX & more

★★★★★ 18,000+ five star reviews Trusted by hundreds of thousands of users

Explore prompts Sell prompts

Featured in THE VERGE WIRED FSTCOMPANY FINANCIAL TIMES TechCrunch Atlantic WSJ

### Explore the Marketplace

Browse 170k+ quality, tested prompts

### Sell Your Prompts

Create, share and earn

### Hire an AI Creator

Discover world class AI experts

### Build an AI App

Create AI apps using

#### Featured Prompts

- Midjourney  
Elongated Animal Illustrations \$2.99
- Midjourney  
Tshirts Designs With Line Art Effects \$4.99
- Midjourney  
Zombie Cartoon Characters NFTs \$3.99
- Ideogram  
Recursive Minimalist Art \$4.99
- Midjourney  
Satirical Portrait Illustrations \$3.99

# Prompt Engineering Fundamentals & Techniques



The world's first conference dedicated to the only way to communicate with the most powerful AI tools currently available

<https://promptengineering.rocks/>  
<https://www.youtube.com/watch?v=-XBpSrT0tfE>

# Prompt Engineering Fundamentals & Techniques

A Swiss Army Knife

Tool

Assistant

Buddy

Business  
Partner

....

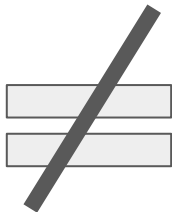
# Prompt Engineering Fundamentals & Techniques

LLMs Need Guidance

Information Retrieval

Asking

*What is the capital of France?*



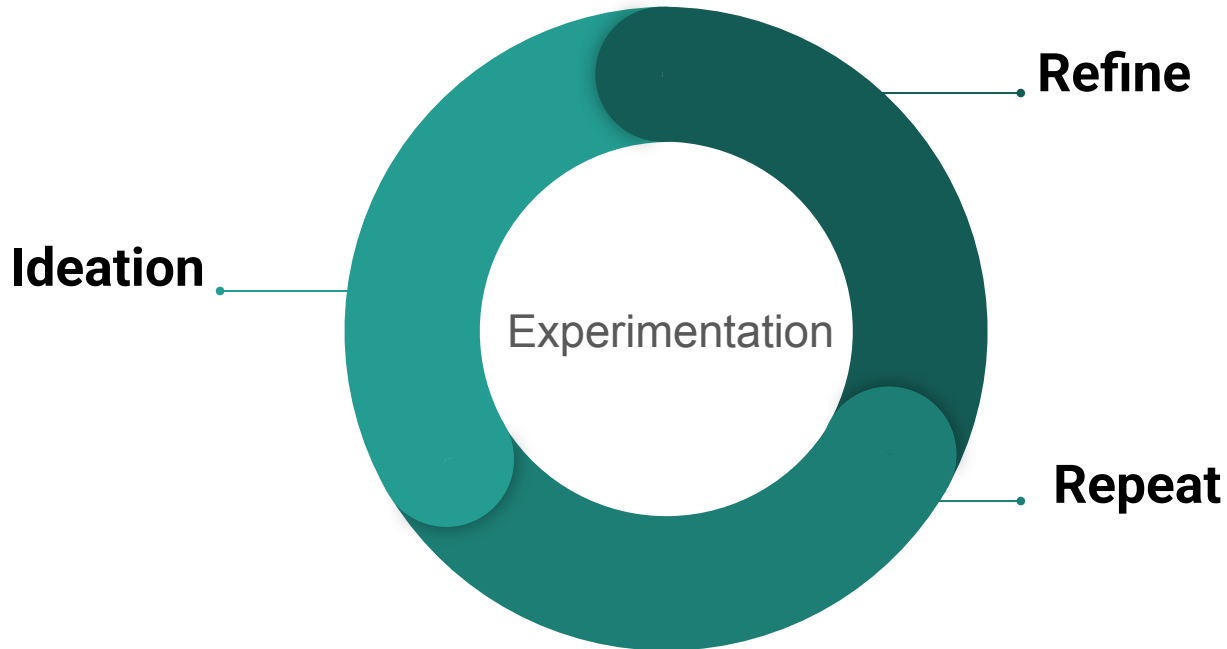
Task Guidance

Prompting  
(guiding)

*Write a poem about a robot falling in love with a sunset, using metaphors related to gears and binary code*

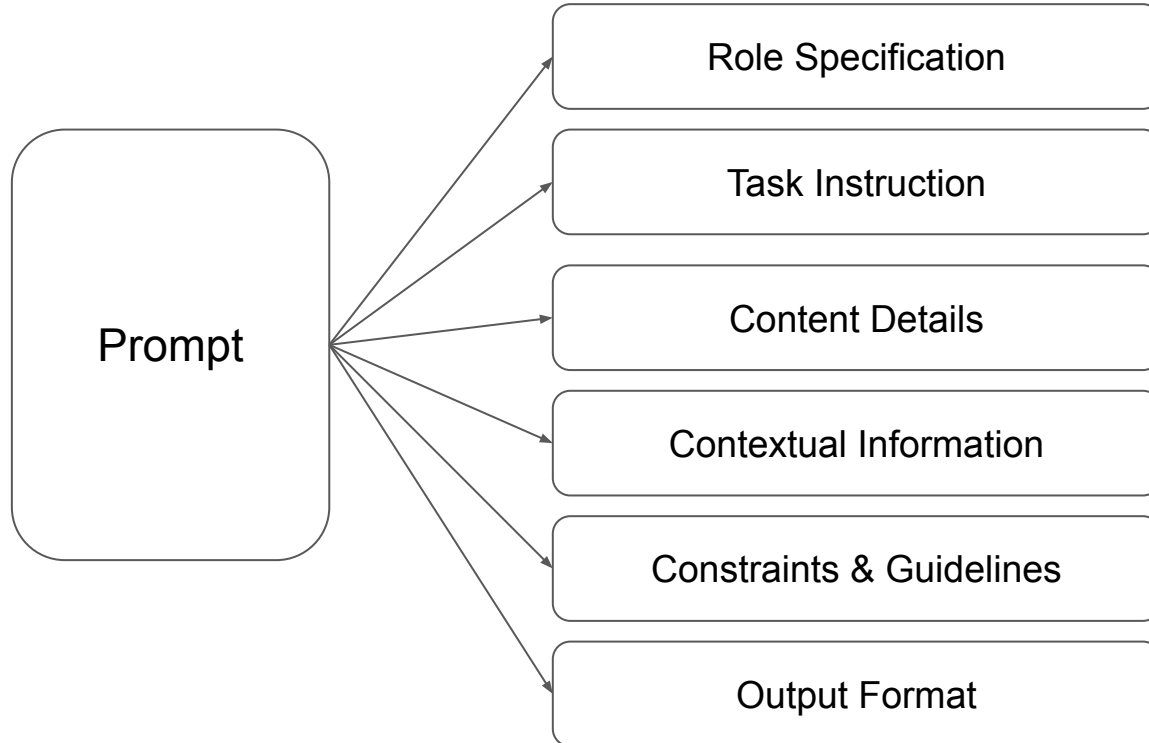
# Prompt Engineering Fundamentals & Techniques

## Prompt Engineering Flywheel

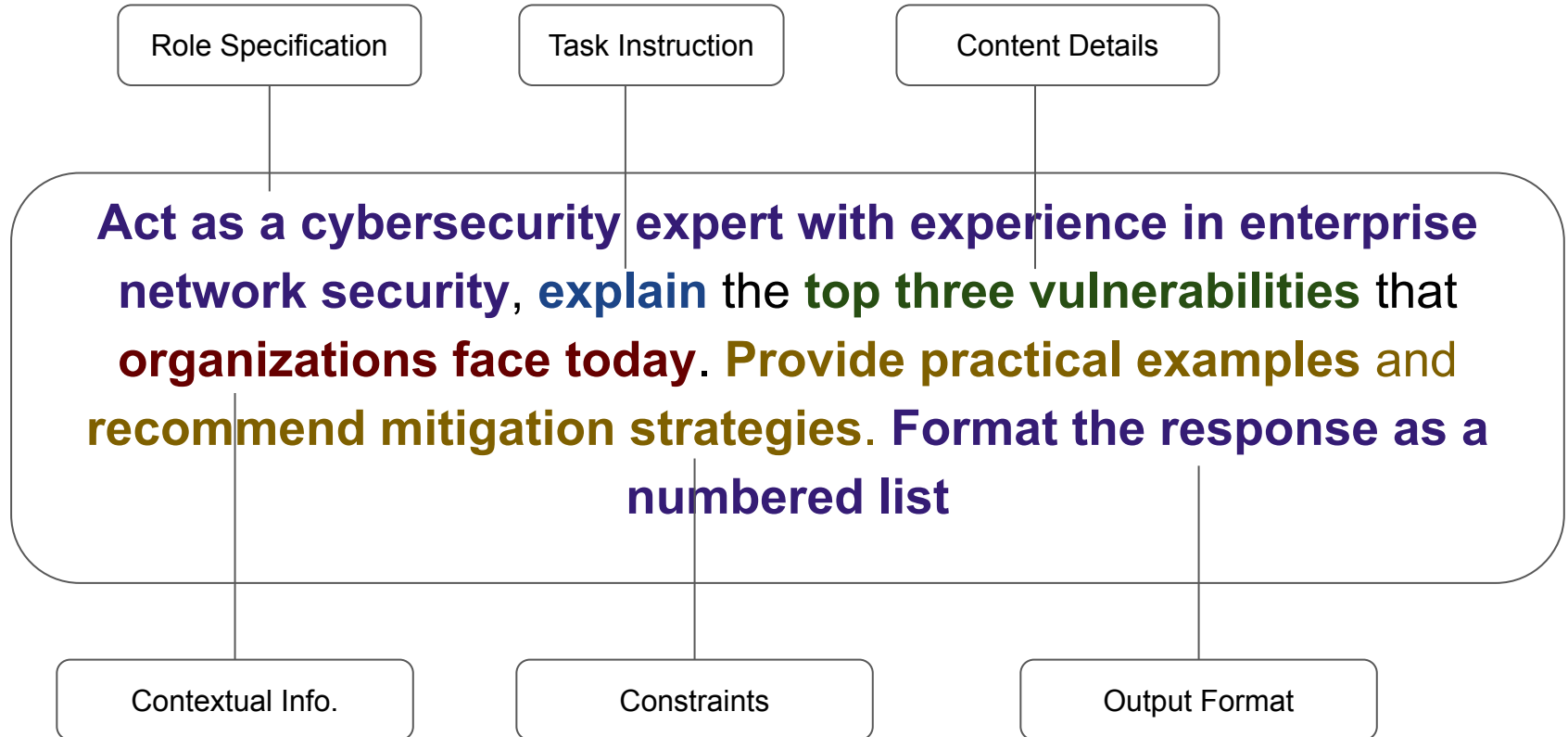


# Prompt Engineering Fundamentals & Techniques

## Key Elements of a Prompt



# Prompt Engineering Fundamentals & Techniques





# Prompt Engineering Fundamentals & Techniques

## Principles of Clear Communication



Clarity

Conciseness

Relevance

Show your prompt to a friend or colleague and ask them to follow the instructions

# Prompt Engineering Techniques

## Popular Prompting Techniques

Zero-Shot

One-Shot

Few-Shot

Chain-of-Thought

Tree-of-Thought

ReAct

Alignment & Steerability

# Prompt Engineering Fundamentals & Techniques

## Few-Shot Example

Generate a social media post announcing a new product launch

Examples 1: "Introducing our newest smartwatch! Track your fitness goals and stay connected on-the-go. #NewArrival #Smartwatch"

Examples 2: "Say hello to our latest eco-friendly backpack! Durable, stylish, and sustainable. #Sustainability #NewProduct"

Write a social media post announcing the launch of our new wireless earbuds, using a similar tone and style to the examples above

# Prompt Engineering Fundamentals & Techniques

## COT Example

I want you to solve mathematical word problems by showing your complete **step-by-step reasoning** before giving the final answer.

Problem: Three friends decide to split the cost of a vacation rental. The total cost is \$1,260 for 7 nights. Alex stays for the entire duration, Beth stays for 5 nights, and Charlie stays for only 3 nights. If they split the cost proportionally based on their length of stay, how much should each person pay?

# Prompt Engineering Fundamentals & Techniques

## COT Example

Imagine you have a lemon, a rock, and a piece of paper. You can use any of these objects to get water from a well that is 10 feet away" How would you do it? **Explain step by step.**

# Prompt Engineering Techniques

## Prompt Categories - Operations

Reductive  
Operations

Transformation  
Operations

Generative  
Operations

# Prompt Engineering Fundamentals & Techniques

## Reductive Operations

Summarization	Say the same thing with fewer words
Distillation	Purify the underlying facts or principles
Characterizing	Retrieve specific kinds of information
Analyzing	Find patterns or evaluate against a framework
Evaluation	Measuring, grading, or judging the content
Critiquing	Provide feedback within the context of text

# Prompt Engineering Fundamentals & Techniques

## Transformation Operations

Reformatting	Change the presentation only
Refactoring	Achieve same results with more efficiency
Language Change	Translate between languages
Restructuring	Optimize structure for logical flow
Modification	Rewrite copy to achieve different intention
Clarification	Make something more comprehensible



# Prompt Engineering Fundamentals & Techniques

## Generative Operations

Drafting	Generate a draft of some sort of document
Planning	Given parameters, come up with plans
Brainstorming	Use imagination to list out possibilities
Amplification	Articulate and explicate something further

# Prompt Engineering Fundamentals & Techniques

## Task

Analyze | Evaluate | Compare | Contrast | Summarize | Predict | Recommend

Explain | Clarify | Generate | Annotate | Compose | Design | Simulate

Debug | Optimize | Interpret | Translate | Categorize | Outline | Propose

Compose | Validate | Construct | Forecast | Debate | Prioritize

Streamline | Strategize | Revise | Develop | Research | Implement

Troubleshoot | Enhance | Audit

# Prompt Engineering Fundamentals & Techniques

## Persona

Travel guide | Linux Terminal | Advertiser | Storyteller | Compose | Debater | Screenwriter | Novelist

Football commentator | Motivational coach | Poet | Philosopher | Real Estate Agent | Life Coach

Recruiter | Florist | Chef | Python interpreter | Public Speaking Coach | Personal Shopper | Legal Advisor

Dream Interpreter | Emoji Translator | King Charles of England | Einstein | World traveler

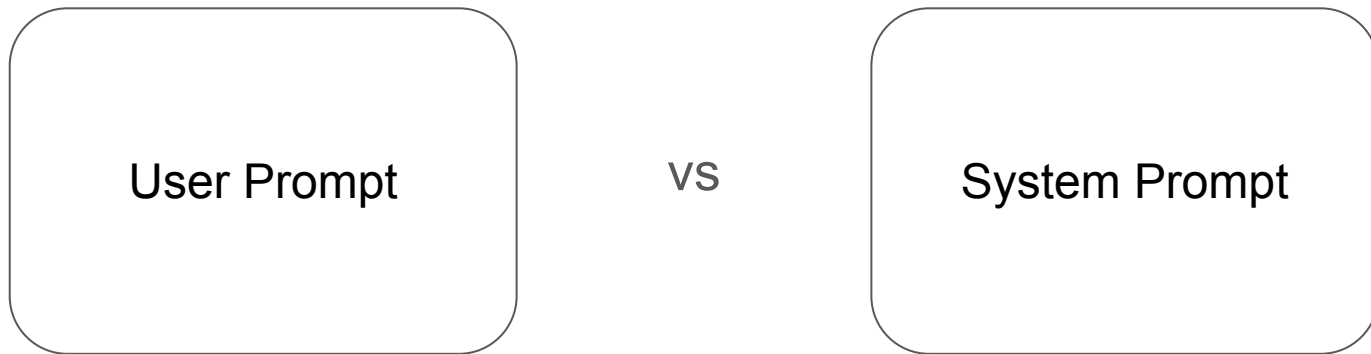
Digital Marketing maven | Educational content creator | Space explorer | Financial analyst

Foodie connoisseur | Tech enthusiast | Health and wellness coach | Fashionista | AI ethicist

I want you to act as a ...

# Prompt Engineering Techniques

## The Tale of Two Prompts



A prompt provided to AI models before they engage with user prompts

# Prompt Engineering Techniques

## System Prompt - AI Model Behavior

### Elements of System Prompt

- Behavioral framing
- Constraint setting
- Context provision
- Ethical Guidance

Defined by developers for specific use cases & remain consistent across user interactions

Act as a compass - ensure the AI model stays on course

# Prompt Engineering Techniques

## System Prompt - AI Model Behavior

Prompt Type	Example
System	You are an experienced career coach who provides actionable advice to professionals looking to advance their careers
User	How can I improve my leadership skills to qualify for a managerial role?
System	You are a technical support agent specializing in troubleshooting software issues for enterprise clients.
User	Can you guide me on how to back up our data securely before reinstalling the software?

See Examples - <https://github.com/hienluu/genai-fundamentals/blob/main/week3/>

# Prompt Engineering Techniques

Label

Welcome to ChatzaRoni Chatbot

Chatbot

Model List

HF\_Mixtral

Max Tokens

900

System Prompt

Prompt

Enter your prompt here

<https://huggingface.co/spaces/hienluu/chatzaroni>

# Prompt Engineering Fundamentals & Techniques

## Temperature & Sampling

Temperature  
(creativity)

Temperature

1.00



Top-p  
(filter)

Top P

1.00

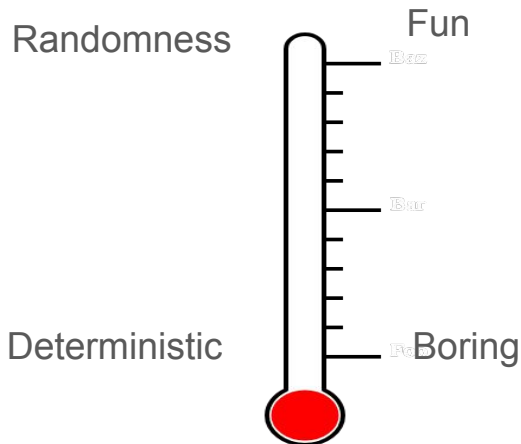




# Prompt Engineering Fundamentals & Techniques

## Temperature & Sampling

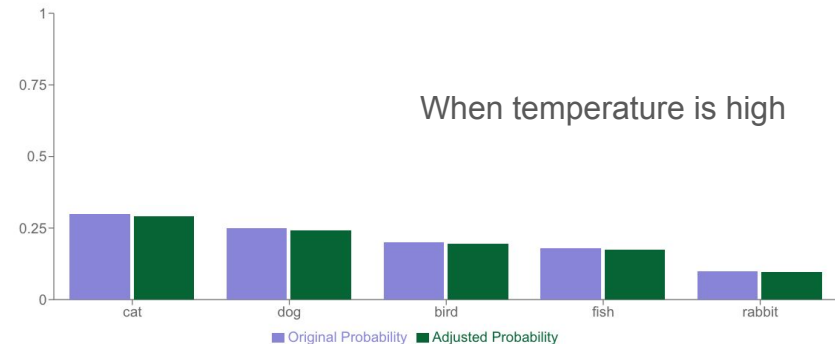
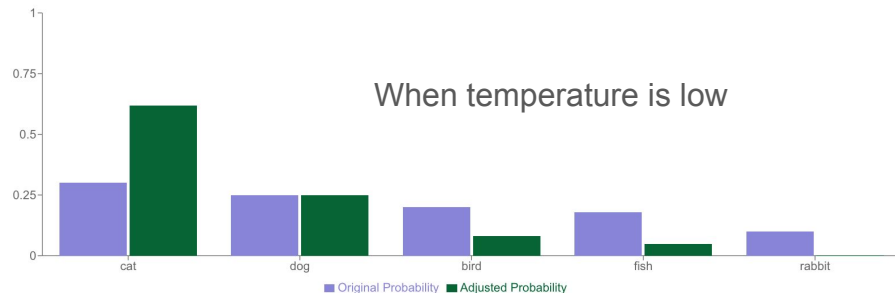
### Temperature



Temperature

1.00

### Probability Distribution



# Prompt Engineering Fundamentals & Techniques

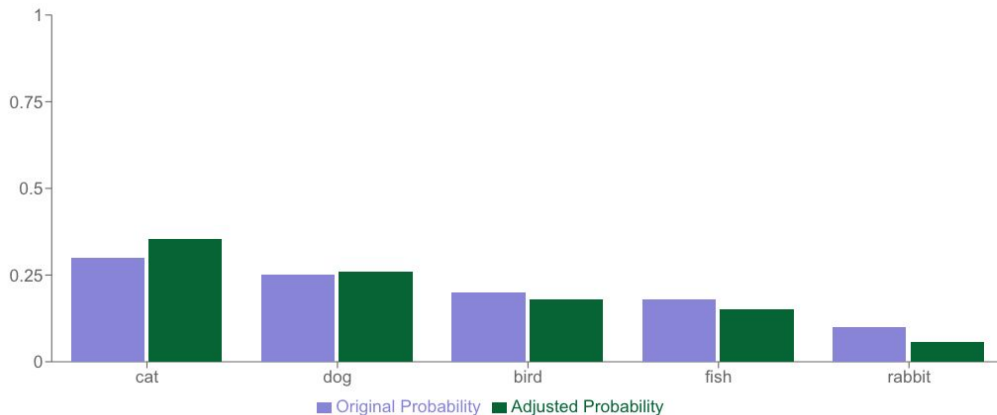
## Temperature & Sampling - Demo

### LLM Temperature and Top-P Visualization

Prompt: My favorite animal is \_

#### Temperature Setting

Temperature:  0.6



# Prompt Engineering Fundamentals & Techniques

## Temperature & Sampling

### Top-P Sampling

Top-p:



0.4

**cat**

0.3831

0.5902

**dog**

0.2661

0.4098

Filter Window - # token to consider

Demo

# Prompt Engineering Fundamentals & Techniques

## Temperature & Sampling

Use Case	Temperature	Top P	Note
Creative Writing	High	High	Creative and unexpected results
Email generation, customer support, code generation	Low	Low	Predictable, focused, conservative outputs
Balanced Exploration	High	Low	Creative outputs, but remains coherent
Summarization, Translation	Low	High	Logical consistency w/ some diversity

# Prompt Engineering Fundamentals & Techniques

## Prompting Techniques - Reasoning Models



### Best Practices

- **Use minimal prompting**
  - Let the model's internal reasoning do its thing
- **Encourage more time reasoning for complex tasks:**
  - Explicitly instruct the model to take time
- **Avoid few-shot prompting:**
  - Minimize examples
- **Leverage for multi-step challenges:**
  - Tasks requiring five or more steps
- **Evaluate cost & latency considerations:**
  - Use non-reasoning models for simpler tasks

# Practical Applications of Prompt Engineering

## Practical Applications

Content Creation &  
Communication

Data Analysis &  
Interpretation

Marketing

Problem-Solving &  
Decision

Automation

Learning &  
Development

# Practical Applications of Prompt Engineering

## Practical Applications

Application	Description
Content Creation	Generate/refine/optimize email, presentation, code, reports
Data Analysis	Identify patterns and insights, actionable actions or recommendations
Marketing	Generate personalized marketing content (user data, crafting tailored messages)
Problem Solving & Decision	Generate/brainstorm potential solutions, evaluate and analyze options
Automation	Automotive repetitive tasks, streamline workflow
Learning & Development	Perform research, generate practices questions, create educational content

# Practical Applications of Prompt Engineering

## Summarization

Strategy	Examples
Basic	Summarize the key points front the content below
Role-based	Summarize the content below as if you are explaining it to <role/persona>
Structure	Summarize the key ideas of the content below in a structured format with sections like <structure>
TL;DR vs In-depth	Give me a one-sentence TL;DR of the paragraphs below, followed by a more detailed summary with examples
Key quotes	Extract the most powerful quotes from content below



# Practical Applications of Prompt Engineering

## Problem Solving & Decisions

Strategy	Examples
Reframing	Reframe the problem statement below from the perspectives of a <persona-1>, and <persona-2>. What are the key challenges each of them sees?
Root Cause Analysis	Using the '5 Whys' technique, analyze the problem statement below. Start with the most obvious reason and drill down to deeper causes.
Decision Matrix	Create a decision matrix comparing the possible solutions to solve <problem>. Use criteria such as <a,b,c>
Incremental vs Disruptive	Suggest two possible solutions to solve <problem>: one that makes small, incremental improvements and another that takes a disruptive approach to <overcome the problem>
First Principles Thinking	Break down the problem statement below using first-principles thinking. What fundamental assumptions are we making about our users, and how can we challenge them?

# Hands On Exercise

## Summarization Exercise

- [https://github.com/hienluu/llm-prompt-engineering-workshop/blob/main/summ  
arization\\_exercise.md](https://github.com/hienluu/llm-prompt-engineering-workshop/blob/main/summ<br/>arization_exercise.md)

## Problem Solving Exercise

- [https://github.com/hienluu/llm-prompt-engineering-workshop/blob/main/proble  
m\\_solving.md](https://github.com/hienluu/llm-prompt-engineering-workshop/blob/main/proble<br/>m_solving.md)
-

# Advanced Prompt Engineering Techniques

Prompt Patterns

Meta-Prompting

# Advanced Prompt Engineering Techniques

## A Prompt Pattern Catalog to Enhance Prompt Engineering with ChatGPT

Jules White, Quchen Fu, Sam Hays, Michael Sandborn, Carlos Olea, Henry Gilbert,  
Ashraf Elnashar, Jesse Spencer-Smith, and Douglas C. Schmidt

*Department of Computer Science  
Vanderbilt University, Tennessee*

Category	Prompt Pattern
Input Semantics	Meta Language Creation
Output Customization	Output Automater Persona Visualization Generator Recipe Template
Error Identification	Fact Check List Reflection

Category	Prompt Pattern
Prompt Improvement	Question Refinement Alternative Approaches Cognitive Verifier Refusal Breaker
Interaction	Flipped Interaction Game Play Infinite Generation
Context Control	Context Manager

# Advanced Prompt Engineering Techniques

## Ask for Input Pattern

Intent:

- Get the LLM to listen to the rules and then ask for the prompt to apply the rules to

Motivation:

- Avoid having LLM immediately generate the response to the rules

Example:

- 

# example

From now on, translate anything I write into a series emojis. Ask me for the first thing to translate.

Ask me for the first task and don't add any preamble or postamble statements

# Advanced Prompt Engineering Techniques

## Template Pattern

Intent:

- Ensure an LLM's output follows a precise template in terms of structure

Motivation:

- Sometimes we need the output to be in a specific and precise format that is application or use-case specific

Example:

- 

I am going to give you a template for your output. CAPITALIZED WORDS are my placeholders. Fill in the placeholders with your output. Please make sure to preserve the overall formatting of the template. My template is:

\*\*\*\*Question\*\*\*\* QUESTION

\*\*\*\*Answer.\*\*\*\* ANSWER

I will now provide the data to format in the next prompt and you will create ten questions using the template.

# Advanced Prompt Engineering Techniques

## Template Pattern

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# Advanced Prompt Engineering Techniques

## Outline Expansion Pattern

Intent:

- Building an outline of a complex and large task and put all the pieces back together later

Motivation:

- Overcome the input limits and incrementally generate the output

Example:

- 

# example

Act as an outline expander. Generate a bullet point outline based on the input that I give you and then ask me for which bullet point you should expand on. Create a new outline for the bullet point that I select. At the end, ask me for what bullet point to expand next.

Ask me for what to outline



# Advanced Prompt Engineering Techniques

## Flipped Interaction Pattern

Intent:

- Have the LLM drive the conversation, ask questions to obtain the needed info. to perform some tasks

Motivation:

- LLM often can leverage the knowledge it has to accurately get the information from the user. Save time

Example:

- 

Ask me questions about my weight loss goals until you have sufficient information to propose a fitness training program for me. When you have enough information, show me the fitness training program.

Ask me the first question.

# Meta-Prompting

## Meta-Prompting



Generating prompts to instruct AI models to perform a certain task

# Meta-Prompting

- Process of designing prompts to generate or refine prompts
  - Focus on how to approach tasks
- Should establish clear boundaries and guidelines
  - Context, tone, or behavior
- Benefits
  - Speed up the processing of coming with effective prompts (automation, scalability)
  - Reduce cognitive load and increase creativity
  - Enhance problem-solving, bring fresh perspectives
  - Improve response quality
  - Generate good prompts based on the task or improve existing ones

# Meta-Prompting

- Ask AI models to help create the prompt for a given goal or task
  - What would be the most effective prompt for ...

*Improve the following prompt: {prompt}*

*You are an expert prompt engineer, and I want you to improve on this prompt so I can get the best result*

# Hands-on Exercise



Summarization Task

Data Analysis Task

Marketing Task

<https://github.com/hienluu/llm-prompt-engineering-workshop/blob/main/hands-on-exercise.md>

# Having Fun



What is the prompt to generate this picture?

# Resources

- [LLMs and Prompt Engineering workshop](#)
- Github repo:
  - <https://github.com/hienluu/llm-prompt-engineering-workshop>