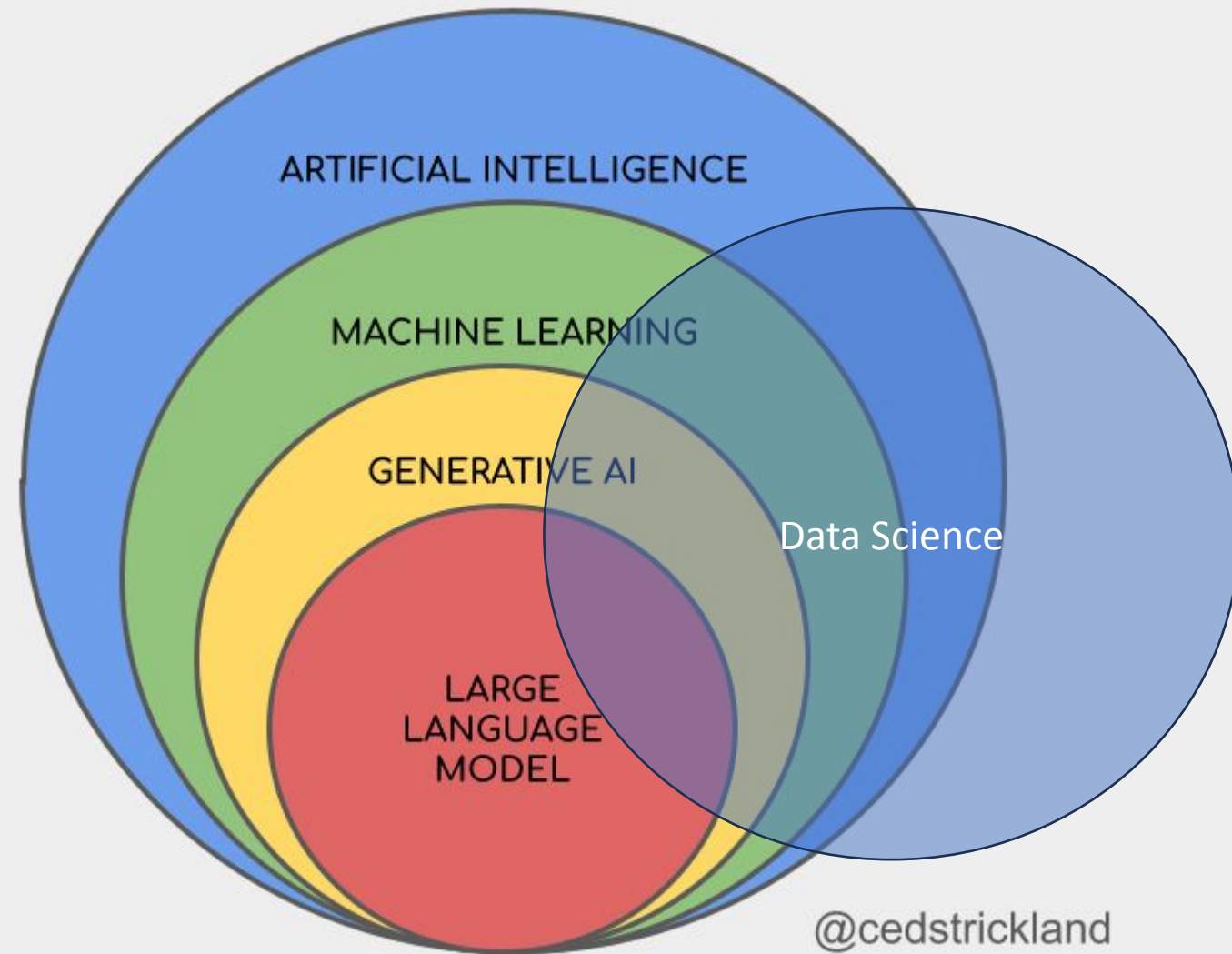


# Generative AI

Sameer Mahajan

**AI** human like intelligence exhibited by machines





# What is Generative AI

- Can produce high quality content as if by a human: text, images, audio, video
- ChatGPT, bard, Bing chat
- Copilots
- Web search, fraud detection, recommenders
- Large scale supervised learning with large training data
- Predict the next word in the sequence
- Foundational Models (GPT-3): pretrained, fine tuned for specific tasks
- Large Language Model (LLM) s: Llama 2/3

# Guardrails

- **Be critical of AI output:** check facts with trusted source (hallucinations), use just as assistant
- **Watch for bias or unfair ideas:** driven by majority of training data
- **Protect privacy:** don't enter your full name, address, aadhar number etc. Treat it like a public tool
  - Protect your API key like password / PIN / OTP
- **Be respectful and legal:** don't create inappropriate content, don't cheat on homework
- **Use academic honesty:** acknowledge AI help if taken

# Tools

- Text

- Stories / QnA: <https://www.yeschat.ai/gpts-20ToO8Z7B9-KidsGPT>
- Summarizer: <https://quillbot.com/summarize>
  - NotebookLM.google.com

- Image / Video generation: <https://www.craiyon.com/> sora veo

- Graphic Design: [midjourney](#) [canva](#)

- Coding: <https://toolbaz.com/writer/ai-code-writer> Copilot

- Songs : [suno.com](https://suno.com)

- ChatGPT

- Analyze data (e.g. <https://www.kaggle.com/datasets> )
- Deep research
- Custom GPTs: Personalized tutor (plus to create new)

- Gemini

# Prompt Engineering

Use ChatGPT or Grok to write an essay on "How to use prompt engineering techniques to write better essays".

Then use the techniques in that essay to improve your prompt and get a better essay. Repeat this a few times until you are happy with the essay.

Share your session with us

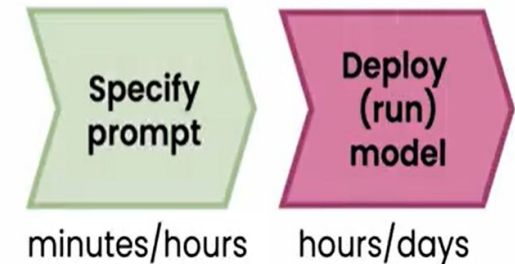
# Prompt Engineering

- Asking the right question
- Give sufficient context
- Describe the desired task
- Guide to think through
- Experiment and iterate
- Some techniques
  - Shots (zero, one, few)
  - Chain of thought
  - Tree of thought
  - Hybrid

Supervised learning



Prompt-based AI



- System messages
- Configuration
- AI Orchestration



# Advanced Techniques

- Fine tuning
- Instruction tuning
- RLHF
- Custom LLMs: BloombergGPT

# Pretraining and Fine-tuning

## Pretraining

My favorite food is a bagel with cream cheese

Input (A)	Output (B)
My favorite food is a	bagel
My favorite food is a bagel	with
My favorite food is a bagel with	cream
My favorite food is a bagel with cream	cheese

Learns from 100Bs of words

## Fine-tuning

What a wonderful chocolate cake

The novel was thrilling

Input (A)	Output (B)
What	a
What a	wonderful
What a wonderful	chocolate
What a wonderful chocolate	cake

Learns from 1000s to 10,000s of words

- When a task is not easy to be defined by a prompt
- Styling / branding
- Domain specific
- Specialization
- transformers.Trainer, Transformer Reinforcement Learning Library (trl):  
[https://github.com/sameermahajan/GenAI/tree/main/fine\\_tune](https://github.com/sameermahajan/GenAI/tree/main/fine_tune)