A Gentle Introduction to Generative AI
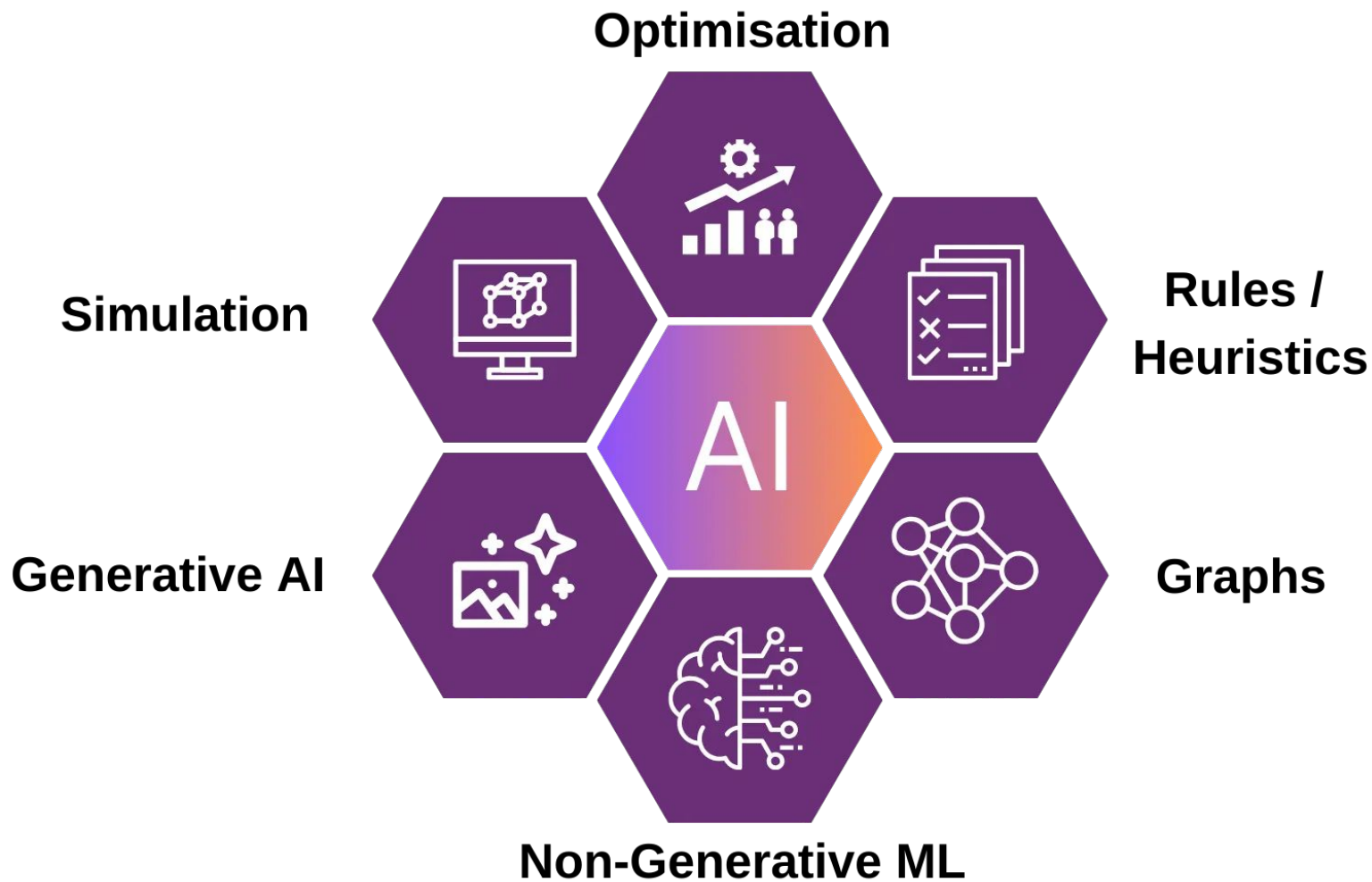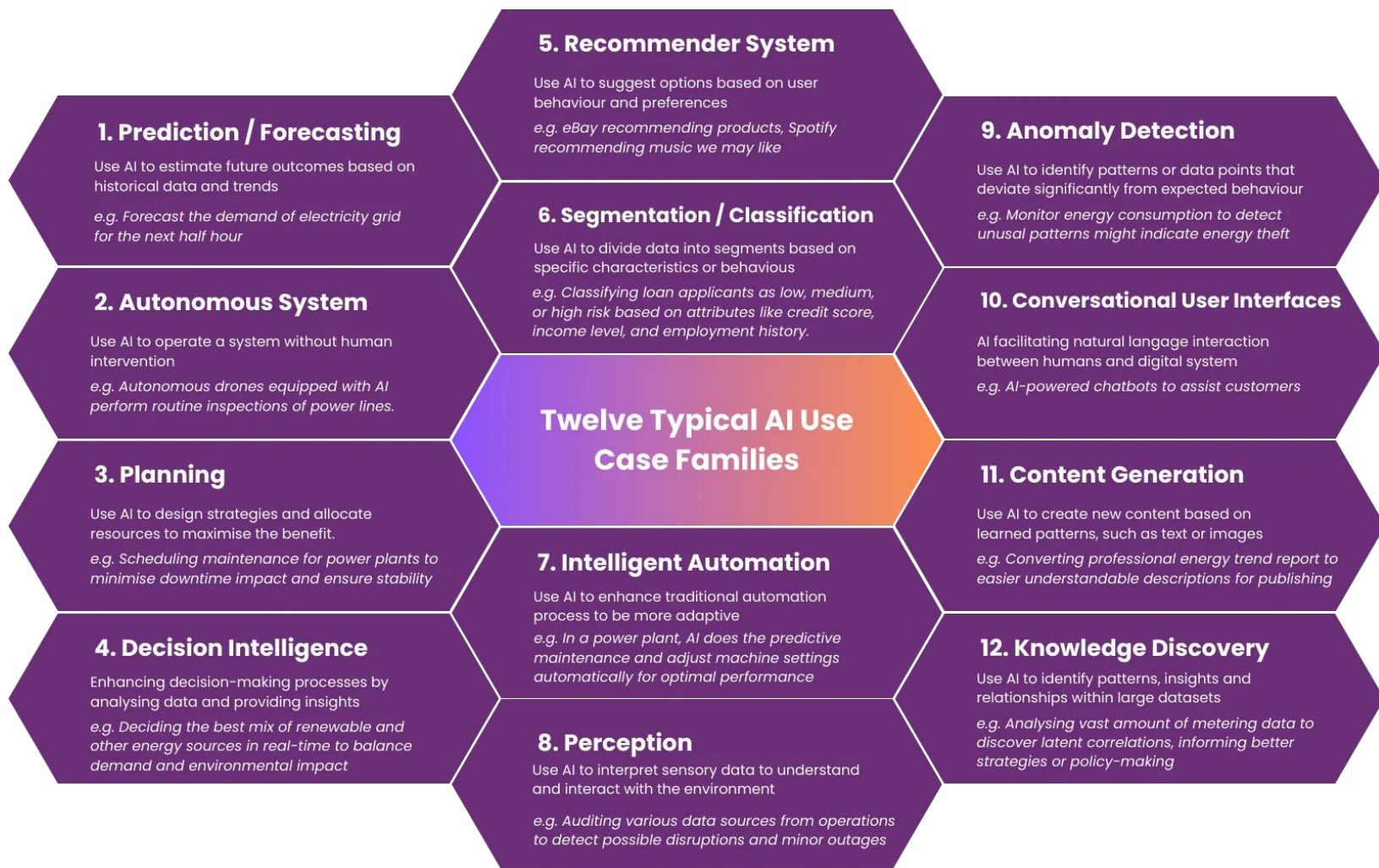
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What are we talking about?

1. Who am I?
2. AI and Common Use Cases
3. Gen AI and LLMs
4. A Bit of Caution
5. How to ChatGPT

AI and Common Use Cases

Optimisation

Simulation

Rules / Heuristics

AI

Generative AI

Graphs

Non-Generative ML

Twelve Typical AI Use Case Families

1. Prediction / Forecasting
Use AI to estimate future outcomes based on historical data and trends

e.g. Forecast the demand of electricity grid for the next half hour

2. Autonomous System
Use AI to operate a system without human intervention

e.g. Autonomous drones equipped with AI perform routine inspections of power lines.

3. Planning
Use AI to design strategies and allocate resources to maximise the benefit.

e.g. Scheduling maintenance for power plants to minimise downtime impact and ensure stability

4. Decision Intelligence
Enhancing decision-making processes by analysing data and providing insights

e.g. Deciding the best mix of renewable and other energy sources in real-time to balance demand and environmental impact

5. Recommender System
Use AI to suggest options based on user behaviour and preferences

e.g. eBay recommending products, Spotify recommending music we may like

6. Segmentation / Classification
Use AI to divide data into segments based on specific characteristics or behavious

e.g. Classifying loan applicants as low, medium, or high risk based on attributes like credit score, income level, and employment history.

7. Intelligent Automation
Use AI to enhance traditional automation process to be more adaptive

e.g. In a power plant, AI does the predictive maintenance and adjust machine settings automatically for optimal performance

8. Perception
Use AI to interpret sensory data to understand and interact with the environment

e.g. Auditing various data sources from operations to detect possible disruptions and minor outages

9. Anomaly Detection
Use AI to identify patterns or data points that deviate significantly from expected behaviour

e.g. Monitor energy consumption to detect unusal patterns might indicate energy theft

10. Conversational User Interfaces
AI facilitating natural langage interaction between humans and digital system

e.g. AI-powered chatbots to assist customers

11. Content Generation
Use AI to create new content based on learned patterns, such as text or images

e.g. Converting professional energy trend report to easier understandable descriptions for publishing

12. Knowledge Discovery
Use AI to identify patterns, insights and relationships within large datasets

e.g. Analysing vast amount of metering data to discover latent correlations, informing better strategies or policy-making

Use Case Families	Common AI Techniques					
	Generative Models	Non-Generative ML	Optimisation	Simulation	Rules	Graphs
Forecasting	Low	High	Low	High	Medium	Low
Planning	Low	Low	High	Medium	Medium	High
Decision Intelligence	Low	Medium	High	High	High	Medium
Autonomous System	Low	Medium	High	Medium	Medium	Low
Segmentation	Medium	High	Low	Low	High	High
Recommender	Medium	High	Medium	Low	Medium	High
Perception	Medium	High	Low	Low	Low	Low
Intelligent Automation	Medium	High	Low	Low	High	Medium
Anomaly Detection	Medium	High	Low	Medium	Medium	High
Content Generation	High	Low	Low	High	Low	Low
Chatbots	High	High	Low	Low	Medium	High
Knowledge Discovery	High	Medium	Low	Low	Medium	High

Large Language Models (LLMs)

- Trained on vast amounts of public data

- All your favorite internet sites...

- ...and all of the ones you hate

- Based on probability and prediction
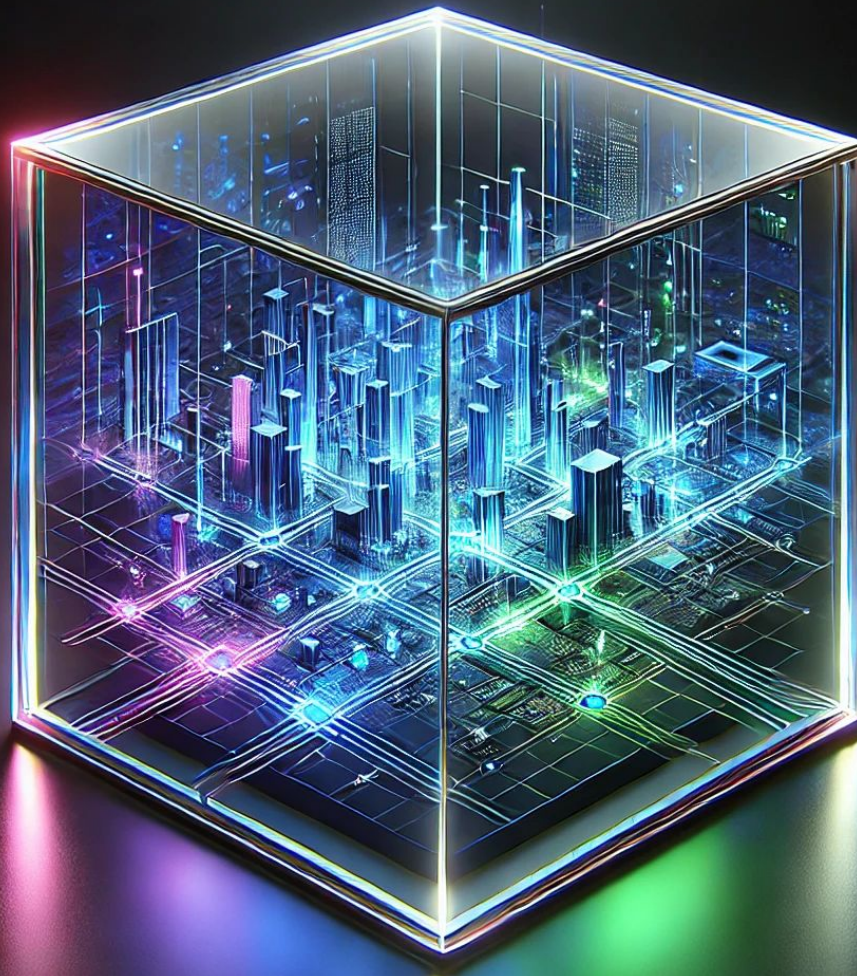
LLMs are Good At:

- Sentiment analysis

- Classification

- Summarizing content

- Answering simple questions (chatbot)

- Editing existing copy

- Initial draft of copy
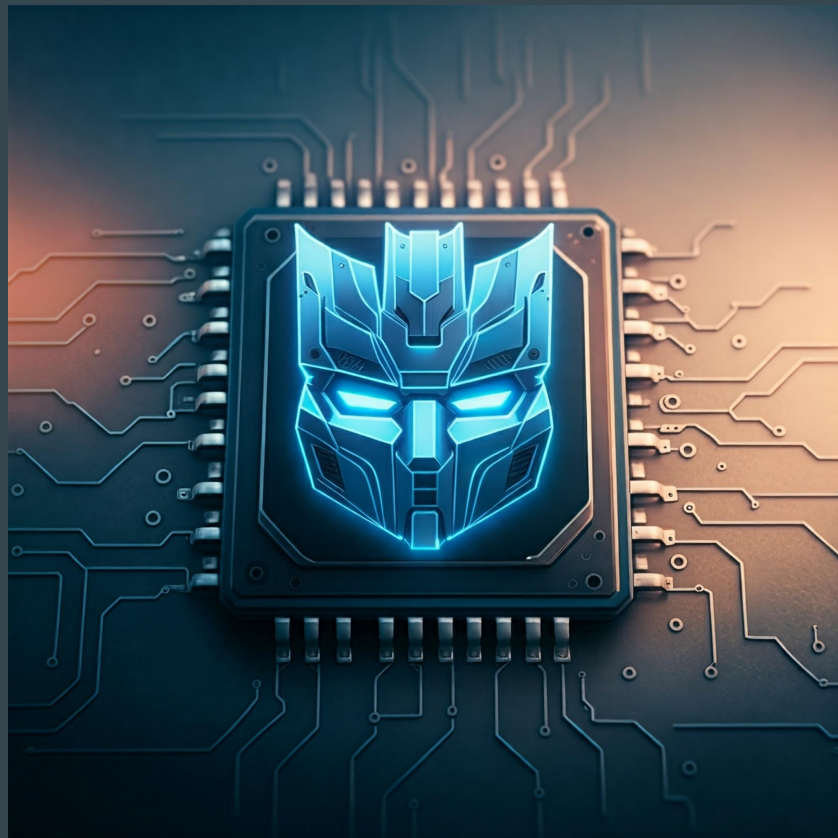
A Bit of Caution

Concerns with Gen AI

1. Fairness & Bias

2. Intellectual Property

3. Explainability & Reliability

4. Privacy & Security
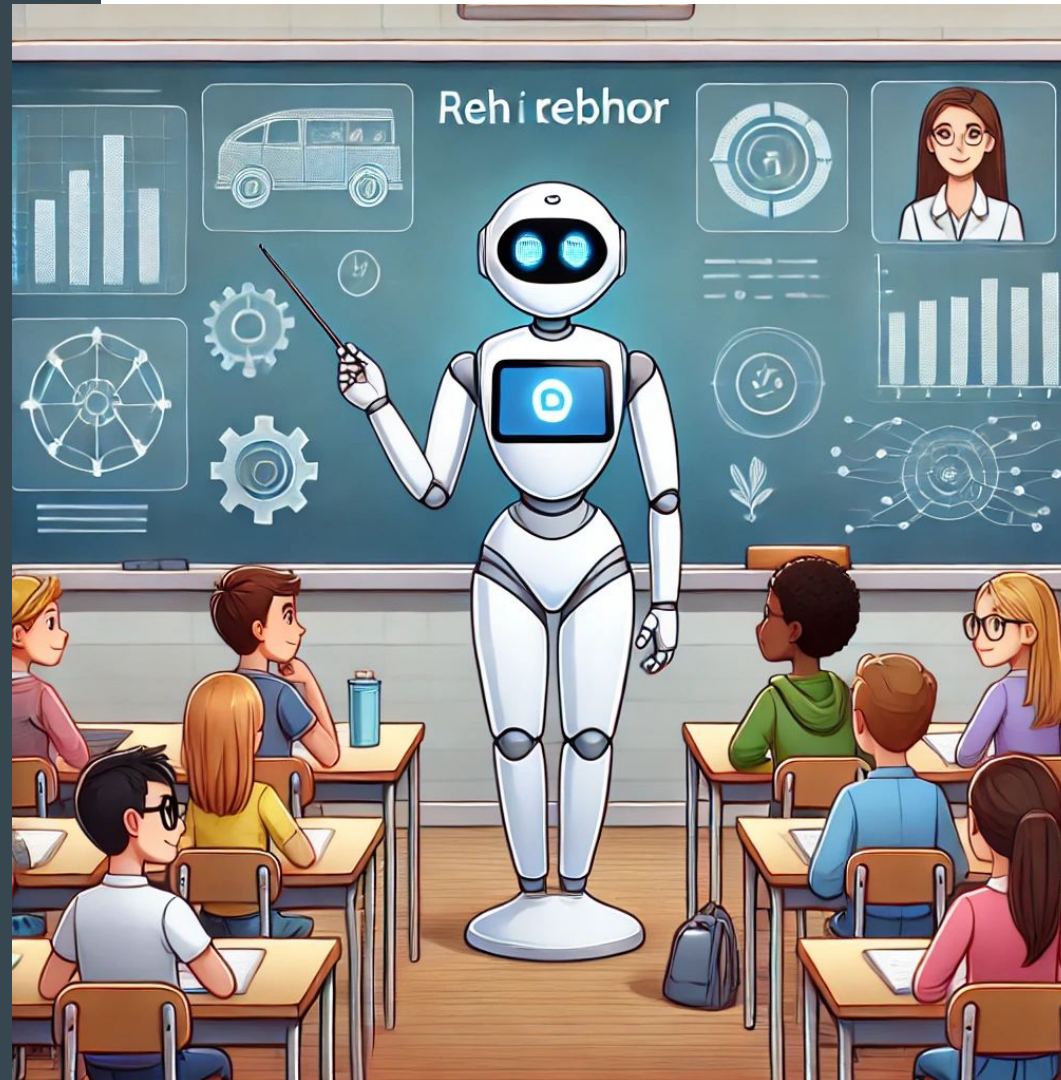
5. Societal & Environmental Impact

Some pointers

1. Create a collection of trusted prompts

2. Trust...but verify

3. Don't let the LLM do too much

4. Continue to test and experiment

5. Consult ArXiv, YouTube, TikTok, etc

https://bit.ly/intro-prompting