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GenAI Capability with guardrails

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GenAI

fundamentals & frameworks,
Implementations, governance & guardrails.

A hands-on intro, on how to use AI to achieve your objectives

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Welcome to the AI Capability Hands-on tailored for SMEs.

This interactive session is tailored to equip both technical and non-technical individuals with a thorough grasp of GenAI, its practical uses, and essential guidelines, particularly focusing on containment and alignment. As GenAI becomes increasingly integrated into our daily lives, establishing robust guardrails will be pivotal for responsible deployment.

During the program, attendees will explore the complexities of various models and frameworks, grapple with the ethical considerations of AI, and gain hands-on experience in developing their own GenAI applications, agents, and chatbots, among other subjects.

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Understanding AI and Its Foundations

First part focuses on introducing participants to AI and its foundational concepts. The sessions are designed to be interactive, with hands-on exercises complementing theoretical knowledge.

The highlights include:

- Demystifying Models, Weights, and Biases
- The differences between tunning vs Prompting
- Introduction to AI frameworks with a spotlight on Langchain
- Exploring no-code AI solutions with LangFlow and Flows

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Implementing, Testing, and Safeguarding AI

Part two shifts the focus towards implementing, testing, and safeguarding AI solutions. Participants will gain insights into testing AI models, addressing safety concerns, and understanding the ethical considerations in AI.

The highlights include:

- Testing and evaluating models using tools like LangSmith and LangForge
- Introduction to GuardRails for AI to ensure business safety
- Practical hands-on session to build a simple AI project

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Key Takeaways at the end of this interactive session, participants will

- Have a clear understanding of AI, models, weights, and biases.
- Be familiar with various AI frameworks and tools.
- Gain hands-on experience in building AI applications.
- Understand the importance of safety and ethics in AI.
- Be equipped with the knowledge to scale AI solutions for their businesses.

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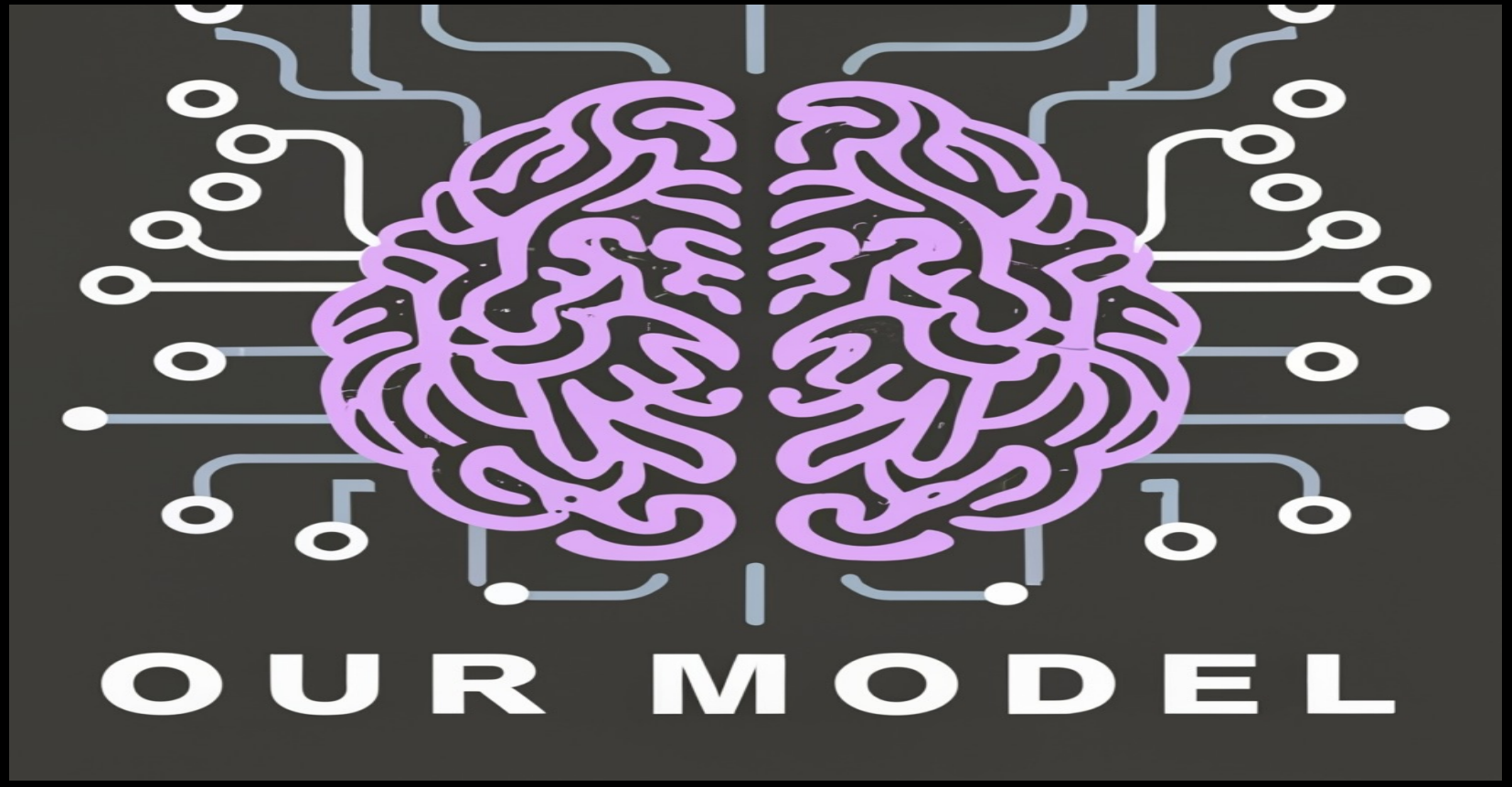
What is a Model



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Your Objectives
&
Key Results

Inference Call

Like finally baking the perfect cookies and sharing them

Prompting

Like asking Can you make the cookies chocolate flavoured

Tuning

Like baking and tasting cookies to make them perfect.

Weight & Biases

Like the amounts of sugar and flour. Adjust them to make cookies taste better.

Model

Think of this like the recipe for cookies. It tells us the ingredients and steps.

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Tunning Vs Prompting

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Tuning

Modular Fine-Tuning of Pre-existing Models For domain-specific tasks, Fine Tuning of existing models is vital. It customizes pre-trained models for specific tasks using domain data. However, this can be costly, as it modifies millions of parameters, needing extensive data and infrastructure. Full fine-tuning risks catastrophic forgetting and results in large, non-modular models. Solutions like Parameter Efficient Fine Tuning (PEFT) offer modular fine-tuning that conserves resources and is cost-efficient.

Your Objectives & Key Results

GenAI Frameworks & Applications

Your Models LLM

Prompting

Prompt Engineering Pre-existing Models Fundamentally, obtaining anticipated results from Large Language Models requires meticulous engineering of prompts. This method entails designing appropriate prompts and inputs to draw out the specific reactions from the model. Engineering prompts is a crucial approach for numerous applications, particularly when general feedback is adequate.

Tunning:(PEFT-LoRA, QLoRA)

Llama 2
GPT-3-Turbo
PALM 2

Prompting: (MRKL, REAct, COT, RAG, Zero Shot)

Llama 2
GPT-3-Turbo
GPT-4
PALM 2
Claude 2

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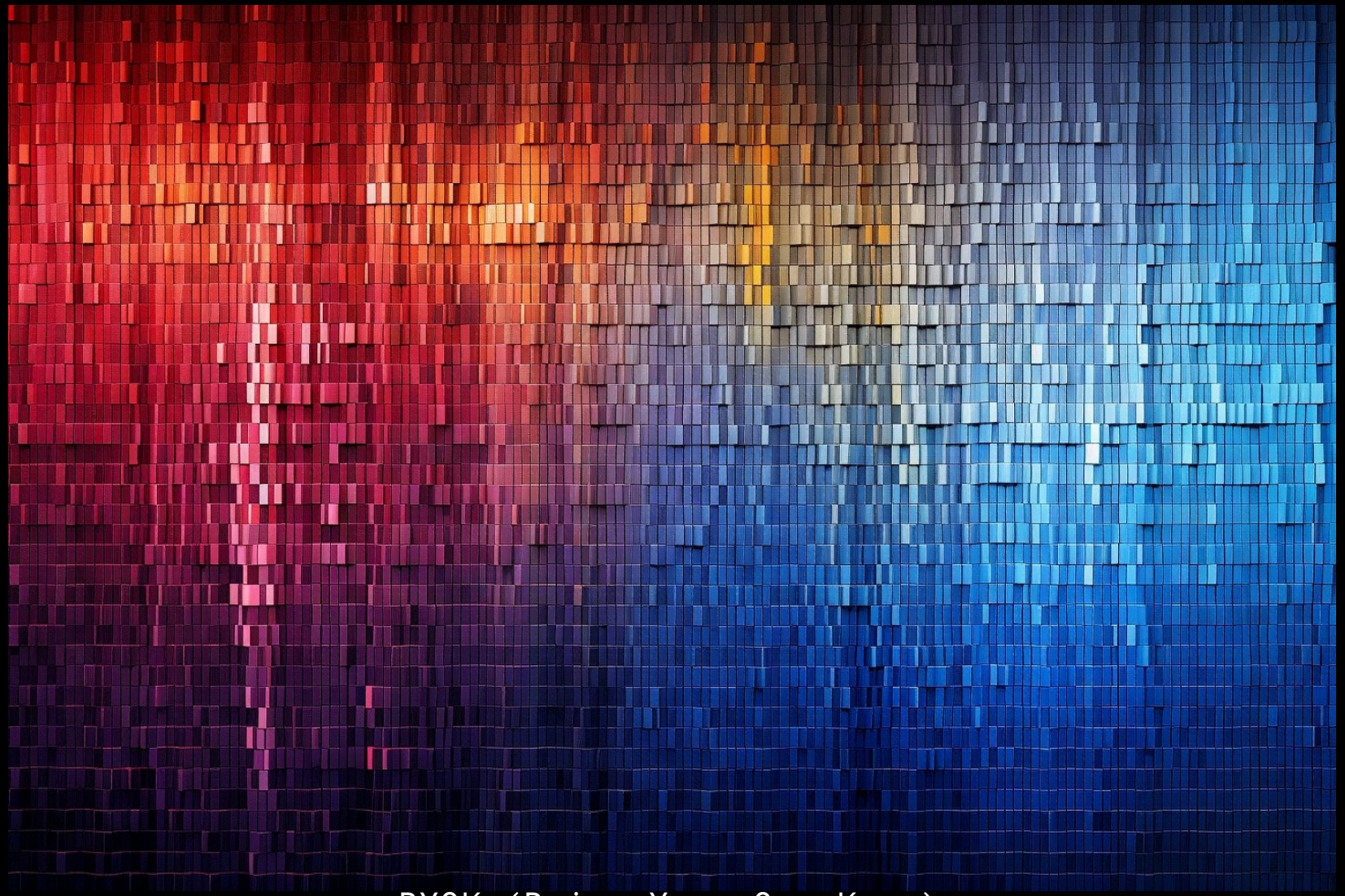

BYOK (Bring Your Own Keys)

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Your Keys

Your Objectives & Key Results

Your Privacy

GenAI Frameworks & Applications

Your Vector Stores

Your Models (LLM)

Your API

Your Key Vault

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GenAI Integrations and Guardrails

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The Sensational GenAI Stack

IAM & Security

Insurance, Financial Sentiments | Health Monitoring & Care | Government, Agriculture, Policing | IT, IoT, Security & Compliance

Multi Modal Applications

Supply Chain, Retail, CCAI | Education | Media, Marketting & Adverising | Personal Assistants

Autonomous Agents

Implement Secure & Compliant GenAI Enterprise Applications in minutes & hours. Using No Code, Drag & Drop only

GenAI QA, Making sure your applications are secure, grounded & have robust guardrails

GenAI Frameworks

Pront Engineering	Pronpt Chaining	RAG	REAct MRKL COT	LangChain
Tools	Toolkits	Functions Calling	Retrievers	LlamaIndex
Memory	Vector DBs	Splitters	Embeddings	HF Transformers
				Functions Calling

Your Data

Company GuardRails

Embeddings Model

Vectorised Data

Opensource & Proprietary GenAI Models
PALM2, Claude2, GPT-4, Llama2

Your API's

Databricks | GCS | Bigtable | BigQuery | EventHub | blob Storage | SQL | Postgre

Azure OpenAI Embeddings
Azure OpenAI API to generate embeddings for a given text

HuggingFace Inference Embeddings
HuggingFace Inference API to generate embeddings for a given text

Cohere Embeddings
Cohere API to generate embeddings for a given text

LocalAI Embeddings
Use local embeddings models like llama.cpp

GoogleVertexAI Embeddings
Google vertexAI API to generate embeddings for a given text

OpenAI Embeddings
OpenAI API to generate embeddings for a given text

Chroma Load Existing Index
Load existing index from Chroma (i.e: Document has been upserted)

Chroma Upsert Document
Upsert documents to Chroma

Faiss Load Existing Index
Load existing index from Faiss (i.e:

OpenSearch Upsert Document
Upsert documents to OpenSearch

Pinecone Load Existing Index
Load existing index from Pinecone (i.e: Document has been upserted)

Pinecone Upsert Document
Upsert documents to Pinecone

Azure ChatOpenAI
Wrapper around Azure OpenAI large language models that use the Chat endpoint

ChatAnthropic
Wrapper around ChatAnthropic large language models that use the Chat endpoint

ChatHuggingFace
Wrapper around HuggingFace large language models

ChatLocalAI
Use local LLMs like llama.cpp, gpt4all using LocalAI

ChatOpenAI
Wrapper around OpenAI large language models that use the Chat endpoint

ChatGoogleVertexAI
Wrapper around VertexAI large language models that use the Chat endpoint

APIM | APIGEE | OPENAPI INITIATIVE | Swagger

GenAI Firewalls & Guardrails

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Itinerary One Day Intensive GenAI Hands-on

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On Day Intensive GenAI

9:00 AM - 9:10 AM: Welcome & Introduction
•Overview of the day
•Introduction to GenAI and its importance

9:10 AM - 9:40 AM: Master the Fundamentals
•Deep dive into foundational models
•The technology behind GenAI

9:40 AM - 10:10 AM: Hands-On Framework Exploration
•Practical demonstration of GenAI frameworks
•Interactive session with participants creating a basic application

10:10 AM - 10:40 AM: Security and Governance
•Introduction to best practices
•Navigating the complexities of GenAI security

10:40 AM - 11:00 AM: Break

11:00 AM - 11:30 AM: Your Own Sandbox
•Hands-on exploration in a sandbox environment
•Guidance on effective experimentation

11:30 AM - 12:00 PM: Q&A and Conclusion
•Open floor for questions
•Recap of the day's learnings
•Next steps for participants

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Two Intensive Deep GenAI hands-on with Guardrails

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Day One – 5hrs

9:00 AM - 9:15 AM: Welcome & Introduction
•Overview of the 2-day workshop
•Setting expectations and objectives

9:15 AM - 10:15 AM: Comprehensive Framework Dive
•Deep dive into GenAI frameworks and tools
•Demonstrations of advanced capabilities

10:15 AM - 10:45 AM: Break

10:45 AM - 12:00 PM: Group Exercises & Collaboration
•Team-based projects simulating real-world GenAI applications
•Feedback and insights from instructors

12:00 PM - 1:00 PM: Lunch Break

1:00 PM - 2:00 PM: Advanced Security & Governance (Part 1)
•Introduction to enterprise-grade security techniques
•Best practices for large-scale implementations

2:00 PM - 3:00 PM: Extended Sandbox Access
•Guided exploration of the sandbox environment
•Hands-on activities and challenges

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Day Two – 5hrs

9:00 AM - 10:00 AM: Advanced Security & Governance (Part 2)
- Deep dive into complex security scenarios
- Interactive session on governance challenges

10:00 AM - 10:30 AM: Break

10:30 AM - 12:00 PM: Group Projects & Presentations
- Teams present their GenAI projects from Day 1
- Feedback and constructive criticism from instructors

12:00 PM - 1:00 PM: Lunch Break

1:00 PM - 2:00 PM: Future of GenAI & Enterprise Integration
- Discussion on the evolving landscape of AI
- Strategies for integrating GenAI into enterprise ecosystems

2:00 PM - 3:00 PM: Q&A, Feedback, and Conclusion
- Open floor for questions and feedback
- Recap of the 2-day workshop
- Next steps and opportunities for participants

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Key Takeaways at the end of this workshop, participants will

- Have a clear understanding of AI, models, weights, and biases.
- Be familiar with various AI frameworks and tools.
- Gain hands-on experience in building AI applications.
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- Be equipped with the knowledge to scale AI solutions for their businesses.

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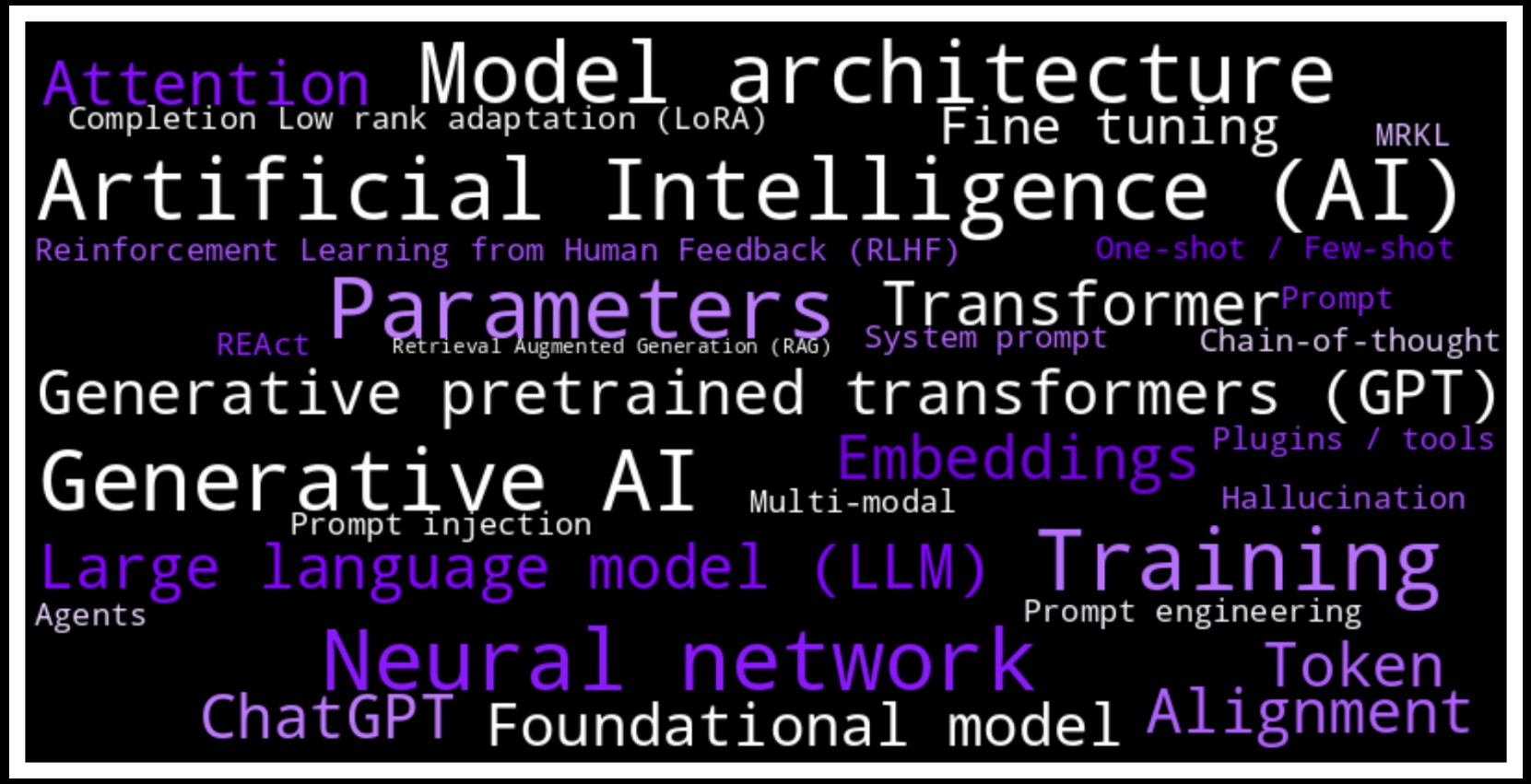
Glossary Terms



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Term	Description
Neural network	Network modelled on the brain
Parameters	Weights that control neural network calculations
Model architecture	Components of a complex AI model
Training	Improving model performance on data
Generative AI	Models that generate text/images from prompts
Generative pretrained transformers (GPT)	Popular large language model
ChatGPT	Conversational version of GPT
Large language model (LLM)	AI model that handles language
Transformer	Popular neural network architecture
Token	Encodes text numerically for models
Embeddings	Represent words/text semantically
Attention	Allows models to understand context

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Term	Description
Alignment	Steers models towards ethical output
Foundational model	Broadly trained model
Fine tuning	Tailoring model to specific tasks
RLHF	Reinforcement Learning from Human Feedback to improve models
Low rank adaptation (LoRA)	Efficient fine-tuning method
Multi-modal	Handle mixed text/image input
Prompt	Text input to models
Completion	Text output from models
Hallucination	Fictional/incorrect output
One-shot / Few-shot	Types of prompting
System prompt	Defines model characteristics
Prompt engineering	Developing effective prompts

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Term	Description
Prompt injection	Subverting models via input
Chain-of-thought	Improves reasoning via breakdown
REAct	Read Evaluate and React
MRKL	Modular Reasoning, Knowledge & Language
Agents	Versatile AI tools
Plugins / tools	Expand capabilities via APIs
Retrieval Augmented Generation (RAG)	Supplementing with searches

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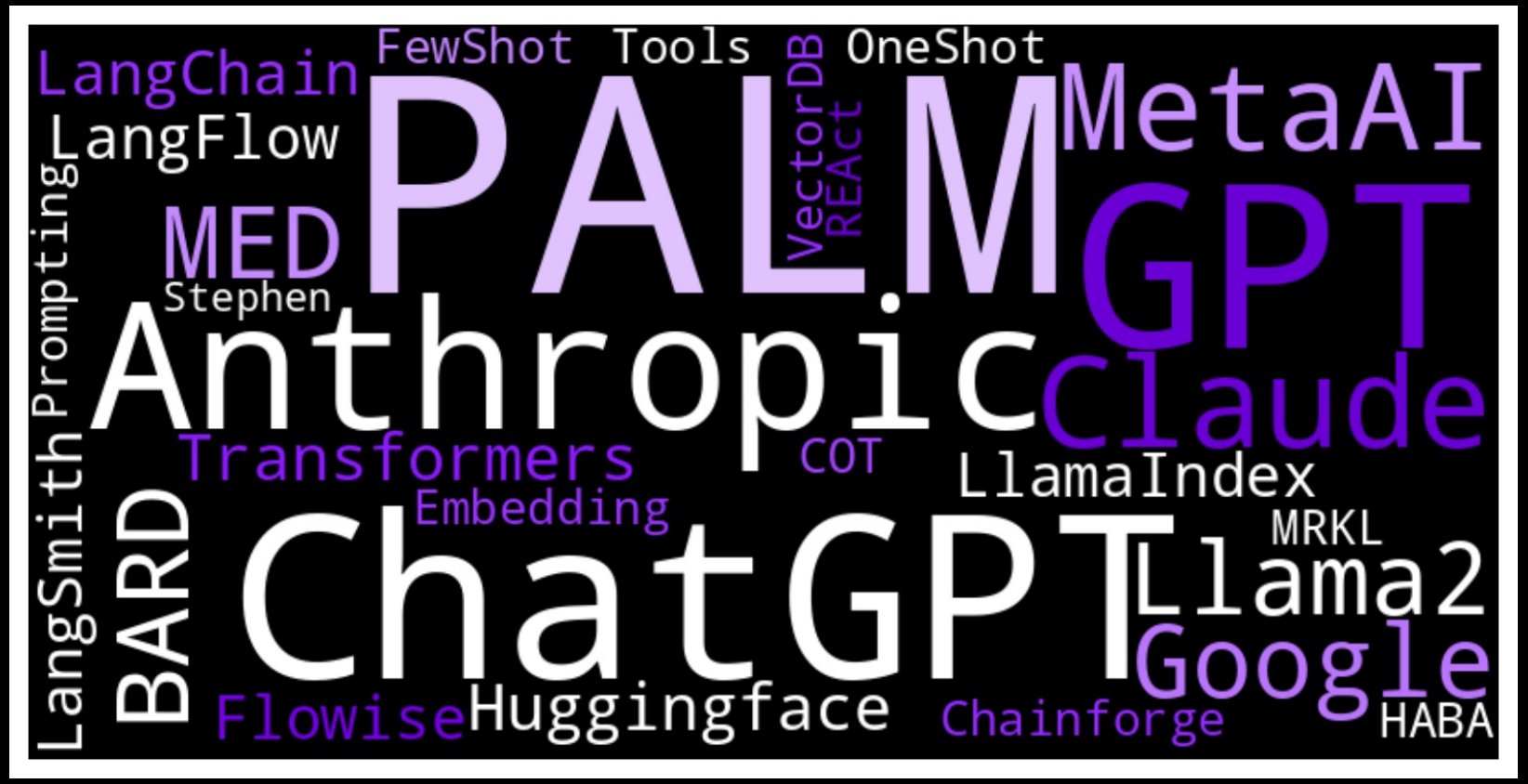
Appendix



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Term	Description	Links
Nvidia Guardrails	Stop AI systems getting out of control	
Langchain:	1.Chaining large language models together, allowing them to converse	https://www.langchain.com
Flowise	Flowise: Workspace for building AI flows visually	https://flowiseai.com
Chainlit	Service for running computations on GPT models	https://docs.chainlit.io/overview
LangFlow	Framework for creating AI pipelines with Python	https://www.langflow.org
LangSmith	Platform for searching AI models and chaining them together	https://smith.langchain.com
Retrieval Augmented Generation (RAG)	Supplementing with searches	
LLM's	(GPT-4, Anthropic, PALM 2, Llama 2)	https://openai.com https://www.anthropic.com https://cloud.google.com/vertex-ai https://ai.meta.com

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Appendix