

AI for Beginners Day 1

Summary Recap & Action Items

Program Introduction

Overview

Day 1 marked the launch of the **AI for Beginners** learning track, transitioning from cloud fundamentals to core Artificial Intelligence and Machine Learning concepts. The session provided a strong conceptual foundation covering AI history, Machine Learning types, Neural Networks, Transformer architecture, Large Language Models, Generative AI, and an introduction to Agentic AI systems.

Participants were encouraged to stay active on LinkedIn for professional visibility and career development. The session also outlined the roadmap for upcoming topics including Prompt Engineering, RAG, and Vector Databases.

Highlights

- Introduction to Artificial Intelligence and its historical evolution
- Machine Learning categories: Supervised, Unsupervised, Reinforcement Learning
- Neural Networks inspired by human brain architecture
- 2012 Deep Learning breakthrough by Geoffrey Hinton
- Transformer architecture from the 2017 paper Attention Is All You Need
- Foundation Models and Large Language Models overview
- Popular LLMs: ChatGPT, Gemini, Claude
- Generative AI hierarchy within AI/ML ecosystem
- Introduction to Agentic AI and Observe–Think–Plan–Act loop
- Technical architecture layers of Agentic AI systems
- Overview of upcoming sessions on Prompt Engineering and RAG

Materials: Study materials and notes will be shared by the trainer for structured learning.

1. Artificial Intelligence Fundamentals

Definition

Artificial Intelligence refers to teaching machines to perform tasks that normally require human intelligence such as speech recognition, translation, recommendation systems, and decision-making.

Historical Context

AI as a formal discipline began in 1956 at Dartmouth College when researchers explored whether machines could simulate thinking.

Evolution Insight

- Early AI systems were rule-based and rigid
 - Modern AI systems learn from data
 - Growth accelerated due to computing power and big data availability
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2. Machine Learning Categories

Supervised Learning

“Show me and I will learn” approach using labeled data.

Applications: Email filtering, fraud detection, face recognition.

Unsupervised Learning

“Figure it out yourself” approach using unlabeled data to find patterns.

Applications: Customer segmentation, content clustering.

Reinforcement Learning

Learning through rewards and penalties.

Example: AlphaGo defeating world champions in Go.

3. Neural Networks & Deep Learning

Neural Networks

Inspired by the human brain’s neuron structure.

- Nodes connected by weights

- Learning occurs through weight adjustment

2012 Deep Learning Breakthrough

Led by Geoffrey Hinton, deep neural networks significantly improved image recognition performance.

Hierarchical Learning

Deep networks process data layer by layer:

Pixels → Edges → Shapes → Objects → Final Classification

4. Core AI Terminology

- **Training Data** – Examples used to teach models
 - **Parameters/Weights** – Adjustable strengths inside neural networks
 - **Tokens** – Text chunks processed numerically
 - **Embeddings** – Mathematical vector representations of words
 - **Transformer Architecture** – Context-aware processing using attention mechanisms
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5. Transformer Architecture & Attention

Transformer Revolution (2017)

The research paper Attention Is All You Need introduced attention mechanisms enabling contextual understanding.

Attention Mechanism

Models focus on relevant words in context instead of processing sequentially.

Training Process

- Pre-training on massive datasets
- Fine-tuning for specific use cases and safety alignment

6. Foundation Models & Large Language Models

Foundation Models

Large-scale pre-trained AI systems that serve as base models for various applications.

Popular LLMs

- ChatGPT
- Gemini
- Claude
- LLaMA
- BERT

Key Capability

LLMs predict the next most probable word based on patterns learned from massive datasets.

7. Generative AI

Definition

Generative AI creates new content including:

- Text
- Images
- Music
- Code
- Voice

Technology Hierarchy

AI → Machine Learning → Deep Learning → Generative AI

8. Introduction to Agentic AI

Traditional vs Agentic AI

- Reactive AI: Responds to prompts
- Agentic AI: Completes goals autonomously

Core Components

- Goal Definition
- Memory
- Planning
- Tool Access
- Action Execution

Agent Loop

Observe → Think → Plan → Act → Evaluate → Repeat

9. Types of Agentic AI Systems

- Personal Assistants
 - Business Automation Agents
 - Research Agents
 - Coding Agents
 - Multi-Agent Systems
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10. Technical Architecture Layers of Agentic AI

Layer 1 – LLM

Brain of the system using APIs such as ChatGPT or Gemini

Layer 2 – Agent Framework

Planning logic (LangChain, AutoGPT, Semantic Kernel)

Layer 3 – Tool Integration

APIs, databases, external systems

Layer 4 – Memory System

Vector databases for long-term retention

Layer 5 – Workflow Automation

Coordination and monitoring layer

11. Large Language Model Deep Dive

How LLMs Work

- Text broken into tokens
- Tokens converted into embeddings
- Transformer processes context using attention
- Predicts next word based on probability

Important Clarification

LLMs do not “understand” language like humans — they recognize statistical patterns.

12. Next Session Preview

Upcoming Topics:

- Prompt Engineering

- RAG (Retrieval-Augmented Generation)
- Vector Databases
- Chunking
- Top-K and Top-P sampling
- Hallucination handling

Study materials and documentation will be shared for structured learning.

Action Items for you

Perform the Day 1 Quiz: [Click Here](#)