

Assignment: AI Around Me

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February 10, 2026

Description

A list of 10 real-life AI applications used daily and the Machine Learning principles that power them.

1. Large Language Models (Gemini/ChatGPT)

Uses **Transformer architectures** to perform next-token prediction, generating human-like text based on the statistical probability of word sequences learned from massive datasets.

2. Smart Navigation (Google Maps)

Analyzes **historical and real-time data** using regression models to predict traffic density and optimize routing for the fastest travel time.

3. Biometric Authentication

Employs **Convolutional Neural Networks (CNNs)** to map facial landmarks or fingerprint patterns into mathematical vectors for secure identity verification.

4. Search Engines

Utilizes **Natural Language Processing (NLP)** and ranking algorithms to understand user intent and retrieve the most contextually relevant information from a global index.

5. Email Filtering

Uses **supervised learning classification** (like Naive Bayes) to analyze headers and content, filtering spam from legitimate communication with high precision.

6. Video Recommendations (YouTube)

Relies on **Collaborative Filtering** and deep learning to predict user preference by matching your watch history with patterns from millions of other users.

7. Predictive Text & Autocorrect

Powered by **Recurrent Neural Networks (RNNs)**, which process sequences of characters to predict the most likely intended word or the next word in a sentence.

8. Music Streaming (Spotify)

Combines **Matrix Factorization** with audio signal analysis to recommend songs based on both your past behavior and the acoustic profile of the tracks.

9. Voice Assistants

Integrates **Automatic Speech Recognition (ASR)** to convert voice to text and **NLU (Natural Language Understanding)** to interpret commands and execute tasks.

10. E-commerce Recommendations

Uses **Association Rule Learning** and predictive modeling to suggest products by identifying correlations between different users' shopping baskets.