

To learn **AI models**, **AI agents**, and **Generative AI** using **Open-Source frameworks**, you can follow a **step-by-step, full-stack learning roadmap**. Here's a beginner-friendly guide that gradually builds your understanding from theory to practical, deployable applications.

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## □ Overview:-

Area	Goal	Frameworks
AI Models	Understand ML, deep learning basics	Scikit-learn, TensorFlow, PyTorch
Generative AI	Create text/images/music/code	Hugging Face, Stable Diffusion, LLaMA, MusicGen, ZerOScope / ModelScope , <b>AnimateDiff</b>
AI Agents	Build agents that reason & act	LangChain, AutoGen, CrewAI
Full-Stack	Deploy AI models	FastAPI, Streamlit, Docker, Gradio

## Final Project Suggestions

1. **AI Personal Assistant:** using LangChain + GPT + tools (browser, calendar, tasks)
2. **Voice AI App:** Whisper + TTS + GPT
3. **Document Q&A App:** ingest PDFs, run RAG with LLM
4. **AI Image Editor:** Stable Diffusion with prompt tuning

# AI Models Projects (ML / Deep Learning):-

## 📖 Beginner

### 1. ML Fraud Detection System

- Tools: Scikit-learn, Pandas
- Description: Build a binary classifier to detect fraudulent transactions.
- Add-on: Deploy using Streamlit or Gradio

### 2. Movie Recommendation System

- Tools: Surprise, LightFM, FastAPI
- Use collaborative filtering and cosine similarity.

## 📖 Intermediate

### 3. Image Classifier for Plants or Food

- Tools: TensorFlow / PyTorch + CNNs
- Use open datasets (e.g. Fruits360)
- Add live webcam input with OpenCV

### 4. Custom Object Detection

- Tools: YOLOv8 (Ultralytics)
- Detect vehicles, products, or faces from your dataset.

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## 📖 AI Agent Projects (LangChain, AutoGen, CrewAI)

## 📖 Beginner

### 5. Document Chatbot Agent

- Tools: LangChain, OpenAI API, Pinecone/FAISS
- Upload PDFs and query with natural language.
- Learn Retrieval-Augmented Generation (RAG)

### 6. Personal Assistant Agent

- Tools: CrewAI or AutoGen
- Does tasks like web search, summarizing, reminders.

## 📖 Intermediate to Advanced

### 7. Multi-Agent Research Team

- Tools: AutoGen + LangChain
- Agents break down a research topic (e.g., climate change), search online, write a report collaboratively.

### 8. Coding Agent with Error Fixing Loop

- Tools: LangChain + LLM + Code Interpreter tool
- Agent writes code, runs it, catches errors, retries.

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## ☐ Generative AI Projects

### 📁☐ Text Generation

#### 9. **Blog Post Generator with Persona Control**

- ☐ Tools: Hugging Face Transformers, GPT-2, Streamlit
- ☐ Customize tone, length, and structure.

#### 10. **Resume Builder from Plain Input**

- ☐ Convert bullet points into a full professional resume.
- ☐ Add Gradio interface or FastAPI backend.

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### ☐ Image Generation

#### 11. **AI Meme Generator**

- ☐ Tools: Stable Diffusion + PIL + Caption Generator
- ☐ Create memes from trending topics

#### 12. **Fashion Design App**

- ☐ User describes a look → SD generates mockup
- ☐ Add ControlNet for pose or style control

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### 🎵☐ Music Generation

#### 13. **Mood-Based Music Composer**

- ☐ Tools: MusicGen, Gradio
- ☐ Input: "Relaxing evening jazz" → Output: MP3

#### 14. **AI Rap Generator**

- ☐ Tools: GPT-2 for lyrics + MusicGen + TTS
  - ☐ Combine text and audio to generate full rap songs
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## 📄 Code Generation

### 15. Natural Language to Code App

- Tools: StarCoder / Code LLaMA + Streamlit
- Input: “Create a Python script that scrapes weather data.”

### 16. AI SQL Generator

- Tools: LLM + SQLite + Gradio
  - Converts natural queries into executable SQL
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## 📄 Video Generation

### 17. Story-to-Video Generator

- Tools: AnimateDiff / ModelScope / ZeroScope
- Input: “A cat flying a spaceship”
- Output: 3-5 second video

### 18. Personalized AI Video Greeting Card

- Combine: TTS (ElevenLabs), ImageGen, AnimateDiff
  - Output: Animated birthday message with music
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## Full Stack AI Projects

### 19. AI-Powered SaaS Landing Page Builder

- Input: “I run a pet grooming startup.”
- Output: Full HTML+CSS+image landing page
- Stack: GPT-4 + Stable Diffusion + Streamlit

### 20. All-in-One Creative Agent

- Tools: CrewAI + SD + MusicGen + TTS + AnimateDiff
- Output: Complete short media story with audio, video, and voice narration from a single text prompt

