

AI-Powered Knowledge Graph to Manim Animation Automation

❖ Project Overview

This project aims to **automate the creation of educational videos** using AI and the Manim animation engine. Imagine a student asking, “*Explain Binary Trees*”. Instead of just getting text, the system generates **slides, a script, and an animated video** that visually explains the concept.

The idea is to make learning more **interactive, automated, and scalable** by combining:

- **Knowledge Graphs** → storing and connecting concepts
 - **AI Models** → generating scripts & explanations
 - **Manim** → transforming ideas into animated videos
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❖ How It Works

1. User Query

- A student enters a topic (e.g., “Photosynthesis” or “Dijkstra’s Algorithm”).

2. Knowledge Graph Retrieval

- The system looks into a knowledge graph (built from textbooks, notes, or public data).
- Finds the **core concept** + related subtopics.

3. AI Content Generation

- AI creates **structured slides** (with points, diagrams, and flow).

- Generates a **teaching script** in natural language.

4. Formatting Layer

- The content is polished into slide-friendly text + storyboard.

5. Manim Automation

- Manim takes the storyboard and converts it into an animated video.
- Text-to-Speech adds narration.
- Captions are added for accessibility.

6. Final Output

- A complete **animated educational video** (MP4 format).
 - Ready to download, share, or integrate into learning platforms.
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❖ Technical Workflow

- **Backend** → Python (Flask/Django) orchestrating modules
 - **AI Layer** → NLP for summarization + text generation (e.g., GPT)
 - **Knowledge Graph** → Neo4j / NetworkX for concept storage
 - **Slide & Script Generator** → Python-based formatter
 - **Animation Engine** → Manim (auto-run scripts)
 - **Storage** → Local/Cloud for videos & metadata
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❖ Why This Matters

- Saves time for teachers & tutors by **automating video creation**

- Helps students with **personalized, visual learning**
 - Scales to multiple domains (Algorithms, Space Tech, GIS, etc.)
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❖ **Summary:**

This project **bridges books, AI, and animations** into one pipeline that delivers **ready-to-learn videos** from just a query.