

TASK 1 REPORT

AI-Based Automated News Video Generation System

Introduction

The objective of Task-1 was to design and implement an AI-based automated system capable of generating short news videos (30–60 seconds) from trending news articles with minimal human intervention.

The system automatically:

- Fetches trending news
- Generates a structured news script using AI
- Creates scene-wise visuals
- Compiles visuals into a final video

To ensure robustness, reliability, and real-world usability, the system is built using a hybrid AI architecture with intelligent fallbacks in case external APIs fail.

Objectives

The key objectives of Task-1 are:

- Automatically fetch trending news articles
- Generate a structured, multi-scene news script using AI
- Analyze scene context for visual generation
- Create scene-based images
- Compile images into a short news video
- Ensure the pipeline remains functional even if AI services are unavailable

System Overview

The system follows a fully automated end-to-end pipeline:

Trending News → Script Generation → Scene Classification → Image Generation → Video Creation

Hybrid logic is applied at critical stages to guarantee system stability and zero downtime.

Instead of generating videos directly from text, the system intentionally follows an image-first approach, where scene-wise images are generated first and then assembled into a video.

This design aligns with real-world media production workflows and ensures greater flexibility, stability, and control.

Detailed Pipeline Explanation

◊ Step 1: Trending News Scraping

- Trending news headlines and summaries are fetched from Google News RSS feeds
- The most recent and relevant article is selected automatically
- HTML tags and noise are removed using BeautifulSoup

Output:

- News Title
- Clean News Summary

◊ Step 2: Hybrid Script Generation (AI + Rule-Based)

The system uses a hybrid script generation approach.

Primary Method – AI-Based Script Generation

- Uses Google Gemini (models/gemini-flash-latest)
- Generates a 30–60 second news script
- Enforces:
 - Exactly 6 scenes
 - One sentence per scene
 - Plain, professional news language

Fallback Method – Rule-Based Script Generator

- Keyword-driven logic
- Automatically activates if:
 - API fails

- Model is unavailable
- Network issues occur

This guarantees that the system never fails to generate a script.

Why Hybrid?

- Prevents system crashes
- Enables offline reliability
- Makes the solution production-ready
- Demonstrates strong system design principles

◊ Step 3: Scene Understanding & Classification

Each generated scene is analyzed and classified into semantic categories such as:

- breaking_news
- police
- emergency
- leaders
- general

This classification enables context-aware image generation and improves visual relevance.

◊ Step 4: Hybrid Image Generation

Local Image Generation (Stable Fallback)

- Images are generated using PIL
- Scene layout:
 - Left: Scene-specific news text
 - Right: AI-generated news anchor image
- Ensures the system works even without internet or external APIs

External AI Image Generation (Optional & Extensible)

- Architecture supports external image APIs such as:
 - Gemini Image Models

- Stable Diffusion
- Banana.dev
- Automatically falls back to local generation if API fails

This hybrid approach ensures both quality and reliability.

❖ Step 5: Video Generation

- Scene images are stitched using MoviePy
- Each scene duration: ~6 seconds
- Video format: MP4 (H.264 compatible)
- Images are pre-processed to ensure even dimensions for encoding stability
- No audio dependency (silent news reel)

Final Output:

outputs/video/automated_video.mp4

Folder Structure (Submitted)

Task-1/

```
|  
|   └── code/  
|       |   └── main.py  
|       └── requirements.txt  
|  
|   └── outputs/  
|       |   └── automated_video.mp4  
|       |   └── automated_video_2_video.mp4  
|       └── assets/  
|           └── anchor_image.png  
|  
└── report.pdf
```