Week 3

# 1. Introduction

In the era of digital transformation, document forgery remains a significant challenge for organizations, universities, and recruiters. AuthenTech provides a reliable and automated certificate verification system that leverages deep learning, OCR, and modern web technologies to ensure authenticity and prevent fraud.

# 2. Key Features

🧠 YOLOv8n Model – Detects forgery/tampering in certificates.

📑 Gemini API OCR – Extracts details (Name, Roll No, Course, CGPA, etc.).

⚡ FastAPI Backend – Provides real-time verification.

🎨 User-Friendly Frontend – Simple upload & instant result.

🔒 Secure & Scalable – Works for individuals, recruiters, universities, and government agencies.

# 3. Tech Stack

Machine Learning & Computer Vision: YOLOv8n, PyTorch, OpenCV, Roboflow

OCR & NLP: Gemini API

Backend: FastAPI

Frontend: Clean, intuitive dashboard

Deployment: Vercel

# 4. System Workflow

1. Certificate Upload – User uploads certificate (PDF/JPEG/PNG).

2. OCR Extraction – Gemini API extracts textual details.

3. Forgery Detection – YOLOv8n model analyzes certificate for tampering.

4. Verification Process – FastAPI backend integrates OCR & detection results.

5. Result Output – User sees certificate status: Authentic or Forged.

7. Week 3 Timeline (15/09/2025 – 27/09/2025)

- Defined project scope and finalized problem statement  
- Integrated YOLOv8n model for forgery detection  
- Connected Gemini API for OCR-based detail extraction  
- Developed FastAPI backend for real-time verification  
- Built a user-friendly frontend dashboard  
- Deployed project on Vercel for live access

# 8. Conclusion

AuthenTech is a powerful, scalable solution that addresses certificate forgery challenges with AI-driven detection and verification. By combining YOLOv8n for tampering detection, Gemini OCR for detail extraction, and FastAPI for real-time backend support, the system ensures accurate, efficient, and secure document validation.