

System Requirements Specification

1. Hardware Requirements

Component	Requirement
Processor	Intel i5 / AMD Ryzen 5 or higher
RAM	Minimum 8 GB (16 GB recommended for smooth training)
GPU	Optional (CPU-only execution supported)
Storage	Minimum 2 GB free disk space
Display	Standard display capable of running Streamlit UI
Network	Internet connection (for initial dataset download)

Notes:

GPU acceleration is optional and not mandatory.

2. Software Requirements

Software	Version
Operating System	Windows / macOS / Linux
Python	3.9 or 3.10
Package Manager	pip
Virtual Environment	venv / conda (recommended)
Web Browser	Chrome / Firefox / Edge (for Streamlit UI)

Required Python Libraries

(All listed in requirements.txt)

torch

torchvision

numpy

matplotlib

scipy

scikit-learn

pillow

pyyaml

tqdm

tensorboard

streamlit

fastapi

uvicorn

opencv-python

3. Development & Deployment Tools

Tool	Purpose
TensorBoard	Training loss visualization
Docker	Containerized deployment
FastAPI	REST API-based inference
Streamlit	Web-based user interface
Git	Version control

4. Compatibility Notes

Fully compatible with **CPU-based execution**

Tested on **macOS** with Python 3.10

Supports local deployment and containerized deployment

No proprietary software required