**Implementation Documentation**

**Live Documentation:** [Project Wiki(git hub link)](https://github.com/Rickyy-Sam07/SolarAI.git" \t "_blank)

* **Technical Architecture:** System design and component overview
* **API Reference:** Complete endpoint documentation with examples
* **Algorithm Details:** Computer vision and calculation methodologies
* **Deployment Guide:** Railway.app production deployment steps
* **Performance Metrics:** Accuracy rates and system benchmarks

**Example Analyses**

**Live Demo:** <https://web-production-7ed9d.up.railway.app/>

**Sample Analysis Results:**

* **Suburban Home (Austin, TX):** 2,400 sq ft roof → 12.8 kW system → $1,847/year savings
* **Urban Property (San Francisco, CA):** 800 sq ft roof → 4.2 kW system → $756/year savings
* **Commercial Building (Phoenix, AZ):** 5,200 sq ft roof → 28.6 kW system → $4,234/year savings

**Test Images Available:**

* Residential rooftops with various orientations
* Properties with obstacles (chimneys, trees, HVAC)
* Different roof materials and conditions

**🚀 Setup Guide**

**Quick Start (5 minutes):**

bash

*# Clone repository*

git clone https://github.com/Rickyy-Sam07/SolarAI.git

cd SolarAI

*# Install dependencies*

pip install -r requirements.txt

*# Run locally*

python app.py

*# Access: http://localhost:5000*

**Production Deployment:**

bash

*# Deploy to Railway.app*

git push origin main

*# Connect to Railway dashboard*

*# Auto-deploys with HTTPS*

**Requirements:**

* **Python 3.11+**
* **Dependencies:** Flask, OpenCV, NumPy, Pillow
* **Optional:** OpenRouter API key for enhanced AI analysis

**🌐 Live Application:** <https://web-production-7ed9d.up.railway.app/>