

Title: UAV-assisted photogrammetry and deep learning for rapid structural inspection and automated damage mapping of industrial structures

Duration: April 2024 to September 2025

Deliverables:

D1: Hybrid deep learning and image processing software (Python-based, open source) for automated damage identification and assessment with usage guidelines handbook

D2: Handbook outlining guidelines for photogrammetry-based 3D model reconstruction of the target structure

Significant Achievements:

- Developed a novel zero-shot surface defect segmentation framework based on the Segment Anything Model (SAM), integrating automated prompt generation through real-time object detection models for accurate defect mapping.
- Successfully completed 3D reconstruction and dimensional measurement of various structures in thermal power plants using RGB imagery acquired from consultancy projects, enabling efficient geometric documentation and assessment

Team: Prawin J (Principal Investigator)

Date: 25/06/2026

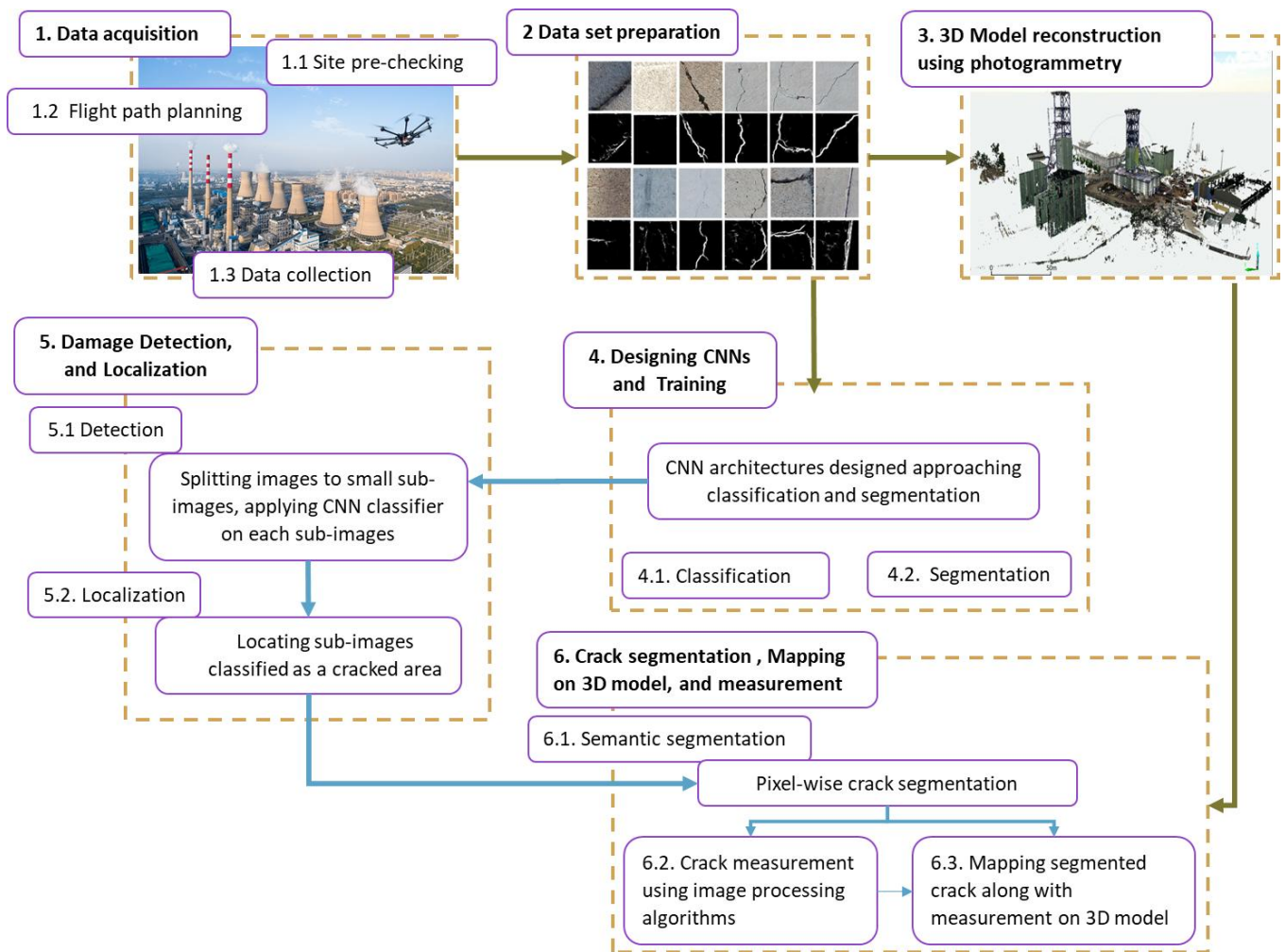


Figure 1. Integrated framework for automated inspection and surface damage mapping of industrial structures