

Surveyr: Real-Time Intelligent Inspections

Helping surveyors complete faster, more accurate surveys by bridging the gap between advanced technology and frictionless adoption.

What We Are Aiming to Do

Surveyr enables surveyors to complete spatial reports entirely onsite in real time, reducing both pre-survey preparation and post-survey workload. The system is being developed to integrate automated pre-searching, defect analysis, and real-time reporting, ensuring that inspections are efficient and accurate. While the broader automation of surveying is underway, defect detection remains critical to minimising inspection time.

The Problem

To develop a machine learning model that first determines whether a defect is present, then correctly identifies its type, classifying cracks and moisture defects, two of the most common issues.

- **Cracks:** Classified by width and severity (Aesthetic, Serviceability, Stability) based on BRE Digest 251, which provides industry-standard guidance on crack identification and remedial approaches.
- **Moisture Defects:** Distinguished by type (Rising Damp, Penetrating Damp, Condensation) following BRE Digest 245, which defines key diagnostic methods for moisture-related issues.

Since defects rarely appear in isolation, ideally the AI model should interpret cumulative structural issues, often requiring both interior and exterior assessments to determine cause and effect. Additionally, precise width and directional analysis of cracks from photographs remains a challenge, presenting an opportunity to explore vector-based AI modelling.

Key Areas of Focus

This workshop provides an opportunity to refine AI-driven inspection technology and could potentially help determine Surveyr's next phase of development. The focus will be on crack detection and classification, ensuring accurate size, shape, and differentiation between defect types based on established surveying standards. Equally important is moisture identification and diagnosis, distinguishing defect types and analysing cause from multiple images, as moisture evidence can present in varied ways.

Expected Outcomes

The goal is to develop a LiteRT (previously known as TensorFlow Lite) model that can be integrated into Surveyr's Android prototype. It is hoped that a successful proof of concept will demonstrate how AI-powered defect detection can support surveyors in real-world applications.

Challenges

Surveyr's AI-driven defect detection must overcome significant technical hurdles to achieve reliable classification and practical integration. Key challenges include:

- Crack detection accuracy. Determining precise width and directional vectors from photographs, and the necessary remedial works.
- Moisture classification complexity. Determining likely cause from photographs and the necessary remedial works.
- Dataset limitations. Sourcing defect imagery is presenting a logistical challenge, along with ensuring sufficient diversity in building types, and addressing copyright concerns is a critical consideration.