



# Can the Terrestrial Laser Scanning (TLS) technology be trusted for monitoring retaining walls?

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## Issue

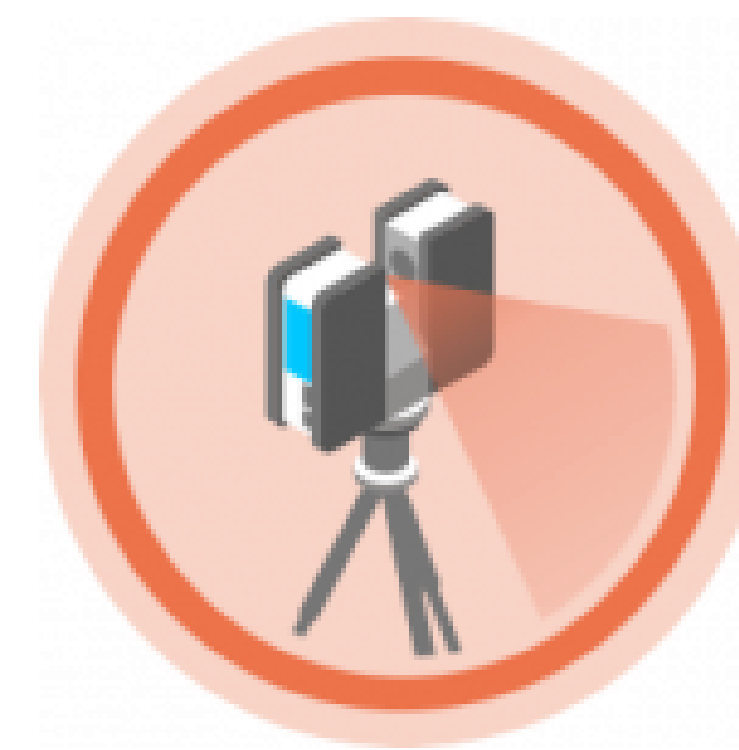


### Retaining walls are inspected visually!

This has the following limitations:

- Human biases
- Incapability of identifying small changes
- Inability to revise inspections
- Mistakes in taking and recording measurements
- Need for access to the inspected asset

## Why TLS?



- Contactless
- Can be operated from long distances (10m-20m)
- Practical
- Quick
- Can be revised (e.g. when accidents occur)
- Ability to identify small changes

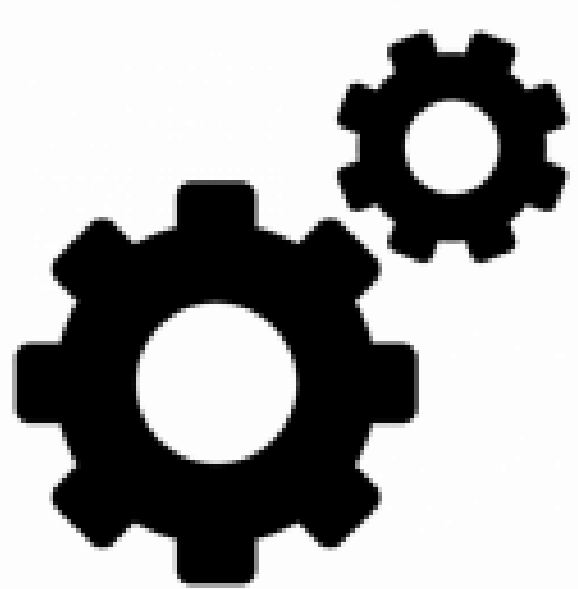
## PhD-Aim

To propose an efficient, quantitative and contactless technique that can replace the current monitoring procedures for monitoring retaining walls

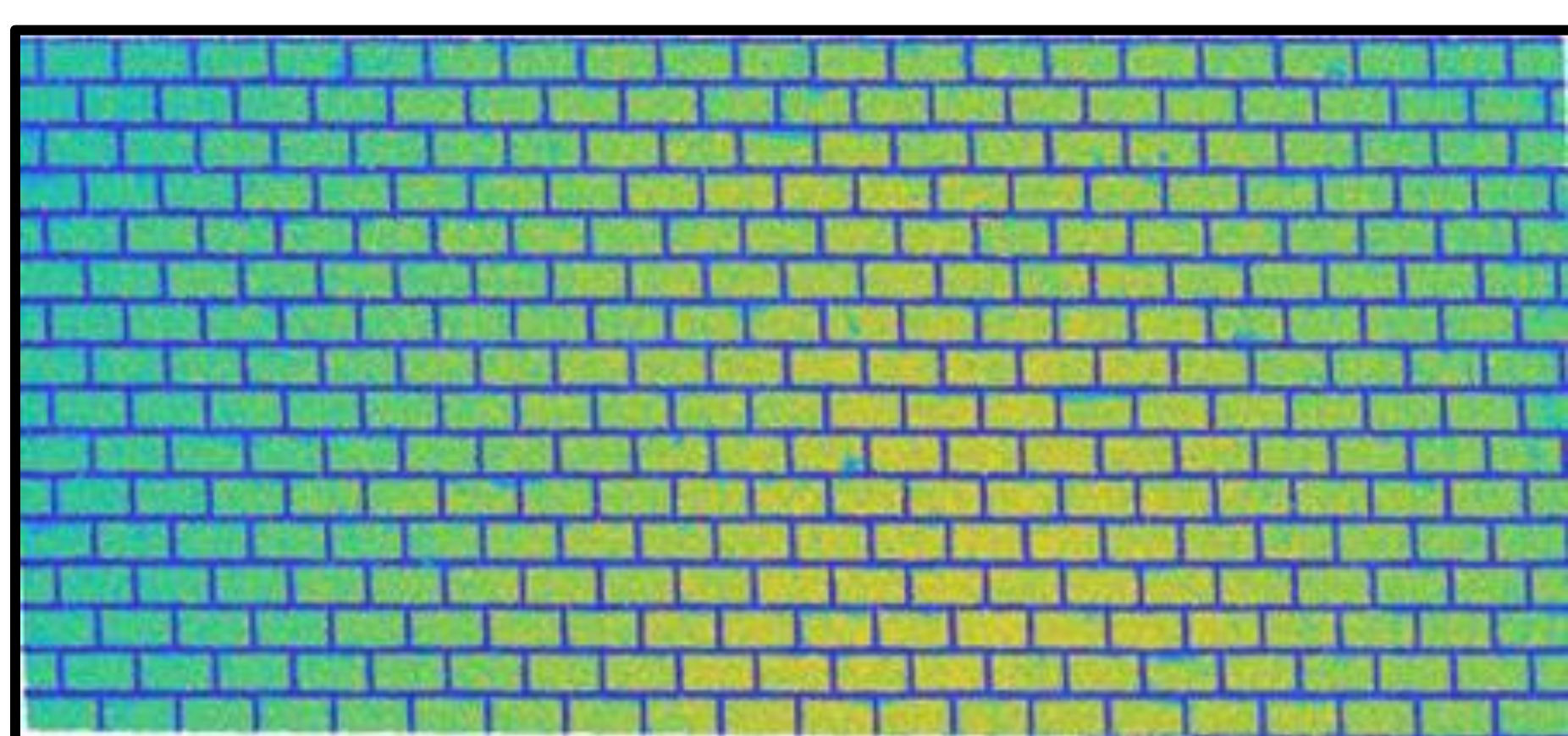
## PhD-Objectives

- To improve the current asset management procedures
- To estimate the accuracy of point clouds
- To suggest the ideal set-up and processing methodology for monitoring retaining walls using TLS
- To enhance the use of non-harmful techniques in civil engineering practises

## PhD Methodology



**3 experiments** are designed to investigate the feasibility of detecting small geometric deformations in retaining walls using the TLS, and suggest the ideal methodology for monitoring the retaining walls. The proposed methodology will be validated via **2 case-studies**; antique and new constructed retaining walls. A summary of the experiments is detailed in the following:



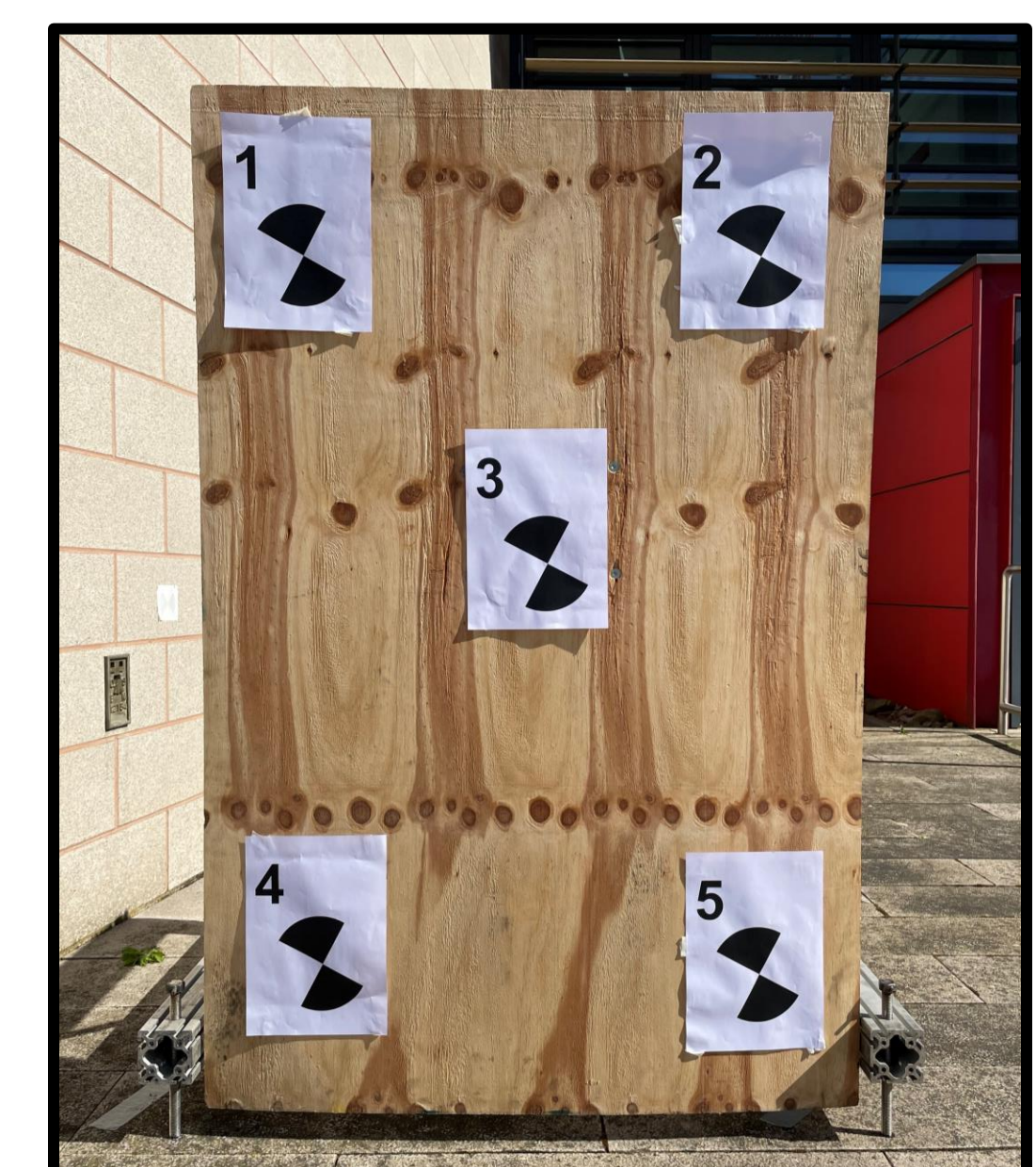
### Experiment 1: Identification of small geometric variances

To examine the feasibility of using the TLS to estimate the positioning difference between the mortar and brick surfaces of a relatively new built wall



### Experiment 2: Accuracy of target identification

To estimate the accuracy of different types of targets that are used in civil engineering projects



### Experiment 3: Accuracy of identifying geometric deformations

To examine the feasibility of the TLS in monitoring a controlled moveable wooden frame