

## **METHOD OF GROUND LASER SCANNING AND DATA PROCESSING WHEN INVESTIGATING HISTORICAL AND CULTURAL HERITAGE OBJECTS**

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**Abstract.** The preservation and accurate documentation of historical and cultural heritage objects are essential to safeguarding our global history. Ground laser scanning (GLS) has emerged as a cutting-edge technology that provides precise 3D data on the geometry and structure of heritage objects. This article examines the methodology behind the ground laser scanning of historical and cultural heritage sites, focusing on data collection, processing, and the resulting advantages in conservation efforts. The article highlights key case studies where GLS has been employed successfully and discusses the benefits of integrating modern technology with heritage preservation practices.

Ground laser scanning (GLS), also known as terrestrial laser scanning (TLS), is a remote sensing technology that uses laser beams to capture the geometry of objects or structures with high precision. The scanner emits laser pulses towards the target, and the time taken for the pulse to return to the sensor provides distance measurements. By collecting millions of points in a matter of seconds, the scanner constructs a detailed 3D model of the object or area.

There are three primary components in GLS technology:

- Laser scanner: The core device that captures the 3D data by emitting laser beams.
- Total station: Assists in aligning and geo-referencing the scanned data.
- Data processing software: Compiles and processes the scanned points into a coherent 3D model.

Ground laser scanning has revolutionized the way we approach the documentation and analysis of historical and cultural heritage sites. Traditionally, documentation was reliant on 2D photographs and manual measurements, which lacked the precision and detail of modern methods. GLS, on the other hand, offers an unprecedented level of accuracy, capturing even the most minute details of an object's surface.

## **REFERENCES**

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