Terrestrial Laser Scanner (TLS)

Terrestrial Laser Scanner is a ground based LiDAR system for capturing accurate and dense point cloud (i.e. millions of points with their X,Y,Z coordinates) at high speed. It is an active sensor which emits laser pulses for measuring the distances to objects. IIT Kanpur has procured **ILRIS3$_6$D^{ER}** from Optech Inc. Canada, which can measure the coordinates of millions of points on the surface of an object. Point density is generally very high resulting in quasi range images of object. The data processing software Polyworks has also been procured.

Unique features

This is a modular instrument and can be carried to remote locations. The **ILRIS3D$_6^{ER}$** can measure up to a range of 1500m. The instrument permits complete 360^0 scanning. Instrumnet supports first and last return and simultaneous capture of RGB using an internal camera. External sensors like GPS and digital camera can also be integrated with **ILRIS3$_6$D^{ER}**.

Figure 1: TLS in operation at an Archaeological Site

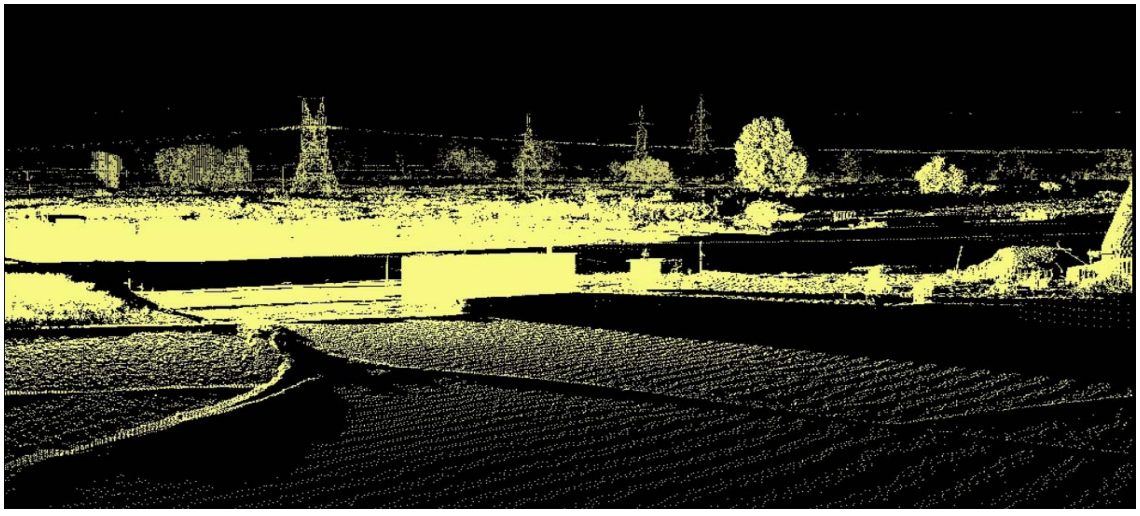

Figure 2: A typical point cloud after inegrating multiple scans

Applications

TLS is a revolutionary technology due the speed at which it can capture a large number of accurate measurements. The bottlenecks faced in problem solving using the conventional technologies are eliminated to a large extent with the TLS. This is the reason that this technology is finding use in several areas. The most noticeable applications are:

1. Digital modelling and archiving of heritage and other structures
2. Landslide monitoring
3. Industrial as-built surveying
4. Geological interpretation
5. Terrain mapping for large scale maps and 3D terrain modelling, etc.
6. Vegetation characterisation

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