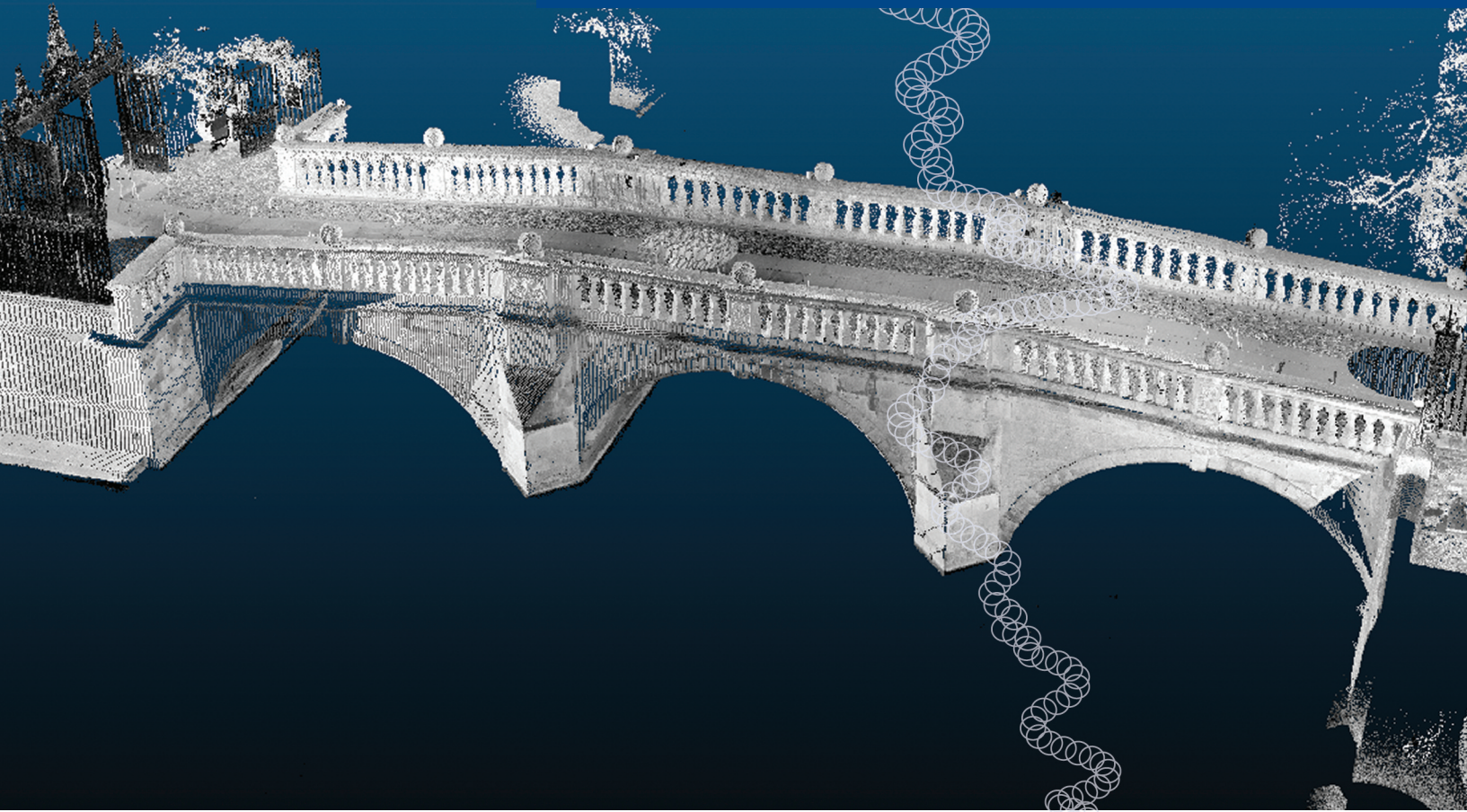


Innovative sensing for infrastructure



Automatic generation of BIM models for infrastructure assets

The technology

The organisation and management of infrastructure assets is critical in the digital age. An information technology approach, called Building Information Modelling (BIM) has been developed in order to manage information. BIM is used by businesses and government agencies to design, construct, operate and maintain diverse physical infrastructure. The challenge faced by asset owners and operators is that most assets were constructed before the introduction of BIM standards and, in many cases, no such BIM model exists.

CSIC is developing cutting-edge software and algorithms to automatically populate BIM files from geometric models, point clouds and computer vision techniques enhanced with semantic information. Point-cloud modelling technology fully automates the generation of BIM models, eliminating errors and reducing manpower hours. The modelling output is a Boundary Representation (BRep) of the structure, which is fed into a

translator that generates the BIM model within IFC (Industry Foundation Class) standards.

CSIC software is being tested on data provided by our industry partners: Transport for London, Laing O'Rourke, and Costain.

Applications

As an accepted standard, BIM is becoming a prerequisite in construction contracts. By 2016 collaborative 3D BIM will be a requirement in all government construction contracts. All project and asset information, documentation and data will be electronic.

Use of computer vision scanning technology, to scan infrastructure assets with access limited by natural conditions, allows us to generate BIM models for large pre-existing assets such as over-water bridges. By using RGB-D sensors, which are robust to poor lighting conditions, we can also generate BIM models for underground assets such as tunnels.

The benefits

- automation of inspection and monitoring tasks for infrastructure assets such as tunnels and bridges
- significant reduction in maintenance costs
- improvement in the quality of asset inspections
- safety of asset inspection personnel
- in the long-term, these technologies will facilitate the adoption of BIM models and IFC standards within the infrastructure sector