PhD Studentship Advert

Automated Asset Recognition using Machine Learning from Photogrammetry and LiDAR data

Description of the research question and proposed project

Today photogrammetry and LiDAR both provide very effective ways to capture the geometry of existing assets. Both technologies can create datasets with hundreds of millions of points and triangles. While those datasets describe the overall geometry of a scene they are not capable of identifying individual objects in the scene, such as the engineering assets.

This research work is aimed at exploring the use of machine learning techniques to automatically identify assets in captured geometry data. The data can be captured using photogrammetry or LiDAR or a combination thereof. The data can be particularly easily captured from UAVs or even from handheld cameras. The costs of such a data acquisition are comparatively low, which makes it possible to repeat them in regular intervals, e.g. bi-weekly. This research project aims at automating the asset extraction from these data sets. The current manual process of delineating and tagging assets is time-consuming and prohibitively costly. As data gets captured more regularly and at increasing resolution the data volume is ever going to increase. This makes manual extraction even less desirable and demands automation. Machine learning techniques in combination with geometric processing provide a high potential for an automated solution.

This research work will also explore the additional potential and advantage that photogrammetry might offer over LiDAR, in that it combines both 3D geometry data and colour imagery. The additional information should provide a better level of identification.

UCL CEGE brings to the project a vast background in geometry processing for object segmentation and machine learning for point cloud classification. We would seek to apply and further this knowledge for asset detection on photogrammetry data.

UCL Civil, Environmental and Geomatic Engineering
University College London Gower Street London WC1E 6BT
Tel: +44 (0)20 3108 1036
j.boehm@ucl.ac.uk
www.cege.ucl.ac.uk

This research project brings together three major themes of current research:

- Artificial Intelligence
- 3D Imaging
- Big Data
- BIM

UCL supervisor

Dr Jan Boehm

Industrial Sponsor

Bentley Systems

Funding Scheme

UCL Impact Studentship for 3 years with £16.000 - £17.000 stipend.

Start Date

Immediately, latest Oct 2017