Title: Preventative Whole Life Asset Management through Image Processing

Type of award	PhD Research Studentship
Department	Engineering Mathematics
Scholarship Details	Scholarship covers full UK/EU (EU applicants who have been resident in the UK for 3 years prior to 1 September 2017) PhD tuition fees and a **tax-free** stipend at the RCUK rate (£14,553 in 2017/18).
Duration	4 years
Eligibility	UK/EU applicants only
Start Date	Before 1 October 2017

PhD Topic Background/Description

The research problem is that our highways clients want to make use of big data to find whole life cost savings through preventative asset management. However, they do not have accurate or reliable databases that can be used to deliver the desired cost savings. Surveying the asset locations is not something that many have the resource to complete again. It has been done poorly may times before.

We are looking for the most cost-effective approach to accurately identify assets and their locations. We are currently thinking that image recognition could help automate the process. We have vast data sets including a LIDAR data set of the entire strategic road network, access to all CCTV camera footage, and Highways England's existing asset database.

A secondary problem, but one that is where the real value lies in managing assets through a whole life approach, is to identify the trends of asset deterioration so that preventative measures can be taken. The advent of Autonomous Vehicles, their cameras, and their potential connectivity to infrastructure, provides an opportunity to collect asset condition data (through images and potentially accelerometers) in real time. However, transmitting a live feed from a camera would cripple the system by information overload and would represent an unnecessary waste of energy and cost. All we want to know is what has changed since the last time the asset was 'inspected'. There would be a need to capture only what information adds value, to transmit it and update existing asset condition databases.

In summary, the research questions can be seen as:

- What is the best way to identify assets and their locations to generate accurate asset inventory lists?

- What is the optimum way of recording the change in the condition of the assets to allow predictive asset management practices?

Candidate Requirements

We are looking for an enthusiastic student with at least a 2:1 Honours degree or equivalent in Engineering, Computer Science or Engineering Mathematics.

Candidates will have a good understanding of data analytics, information processing and image recognition. A knowledge of AutoDesk and Bentley software is also desirable.

Informal enquiries

Please contact Prof Eddie Wilson at Re.Wilson@bristol.ac.uk

For general enquiries relating to the application procedure, please email gsen-pgrs@bristol.ac.uk

Application Details

To apply for this studentship submit a PhD application using our online application system [www.bristol.ac.uk/pg-howtoapply] and select the Engineering Mathematics programme.

Please ensure that in the Funding section you tick “I would like to be considered for a funding award from the Engineering Mathematics Department” and specify the title of the scholarship in the “further details” box below with the name of the supervisor.

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