

Positioning Buried Pipes and Cables in Urban Canyons Using an Integrated GNSS Approach

**Gethin W. ROBERTS, Oluropo OGUNDIPE, Craig HANCOCK,
Ahmad TAHA and Jean-Philippe MONTILLET, United Kingdom**

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ABSTRACT

Urban areas with their tall buildings and narrow corridors are extremely challenging environments to use a positioning system such as Global Navigation Satellite Systems (GNSS) which depends on an open sky view in order to have a line of sight to each satellite. However, there are many urban applications for example, the positioning of buried assets such as pipes and cables which require the advantages that GNSS positioning brings. There are over 4 million kilometres of buried pipes and cables currently in the UK (Taha et al, 2006). Many of these have not been accurately mapped thereby leading to increased disruptions through street works as trial pits have to be dug in order to locate the required utility. As a result projects such as the Technology Strategy Board (TSB) funded VISTA and the EPSRC funded Mapping The Underworld (MTU) projects are being undertaken to deal with the challenge of locating and visualizing both past, present and future buried utilities. The University of Nottingham as part of the VISTA and Mapping The Underworld projects has carried out some trials to investigate the use of an integrated GNSS approach in positioning and visualizing buried pipes and cables. As part of the project, research was conducted into GPS/INS integration, the use of high sensitivity GPS, future GNSS constellation simulation, GPS/GPR integration, laser scanning and augmented reality in order to aid accurate positioning and visualisation of buried assets. The paper highlights some of the results achieved so far.

CONTACTS

Dr. Gethin W. Roberts, Chair Elect of FIG Commission 6
Reader in Geospatial Engineering
IESSG
The University of Nottingham
Nottingham NG7 2RD
UNITED KINGDOM
Tel. + 44 115 9513933
Fax + 44 115 9513881
Email: gethin.roberts@nottingham.ac.uk

Dr. Oluropo Ogundipe, Mr. Craig Hancock and Mr. Ahmad Taha
IESSG

The University of Nottingham
Nottingham NG7 2RD
UNITED KINGDOM

Email: oluropo.ogundipe@nottingham.ac.uk ; craig.hancock@nottingham.ac.uk ;
ahmad.taha@nottingham.ac.uk

Mr. Jean-Philippe Montillet
Forsberg Services Ltd
UNITED KINGDOM