Fully-funded PhD in development of a UAV-based landslide monitoring system

Applications are invited for a 3.5 year PhD studentship, jointly-funded by the British Geological Survey and Newcastle University, commencing September 2013. This will focus on the development of an unmanned aerial vehicle (UAV) based landslide monitoring system. The PhD will be based in the School of Civil Engineering and Geosciences, Newcastle University, and will involve close collaboration with scientists from the British Geological Survey (BGS). **UK and EU applicants are eligible for the full studentship, and the position will remain open until filled.**

Landslides present a significant hazard to infrastructure, property and human life. Underlying processes are often poorly understood, and can be difficult to predict. UAV platforms offer exciting new opportunities to capture surface processes at high spatial resolution, on-demand and at low-cost. This research will explore the potential of a mini-UAV for landslide assessment, and will integrate resultant surface observations with sub-surface datasets to provide an enhanced environment for interpretation of landslide behaviour.

A fixed wing UAV, owned by the School of Civil Engineering and Geosciences will be used in the research. This is equipped with cameras for photogrammetric image capture, as well as a capability for logging position and orientation. The aim of the PhD is to optimise UAV-derived datasets to improve multi-temporal analysis of landslide processes, with synthesis of geotechnical and geophysical observations (provided by the BGS). This will involve development and refinement of a Kalman filtering algorithm for coupling UAV position (GPS) and orientation (IMU) data, enabling direct georeferencing of photogrammetric models. This will be extended to integrate observations derived from a DEM surface matching algorithm to deliver a novel approach for multi-temporal registration of UAV outputs. Through application to an active landslide site, the project will also explore the integration of surface and sub-surface (geotechnical, geophysical) datasets to deliver a holistic environment for landslide interpretation.

Applicants should ideally have a background in Geomatics (photogrammetry, surveying, geodesy). Candidates with qualifications in Mathematics, Computing Science, Physics, or an engineering discipline, who are interested in applying these skills to problems in measurement and monitoring science are also encouraged to apply. This project requires strong numerical and analytical skills, and programming experience (Matlab, C++). Applicants must also be comfortable in undertaking regular field work. The successful candidate will be expected to become competent in operating the UAV, so an interest in this aspect would be desirable (full training will be provided).

Applications should be made directly through www.ncl.ac.uk/postgraduate/apply/ Please ensure you include a CV and transcript of grades. For further details or informal discussion, contact Dr Pauline Miller (pauline.miller@ncl.ac.uk or by phone: 0191 222 3660) or Dr Jon Chambers (jecha@bgs.ac.uk).