

## Project proposal

<i>Project title</i>	Evaluation of methods to increase the density of extracted elevation points using digital photogrammetry	
<i>First Supervisor</i>	Dr <input type="text" value="v"/>	Mike Smith
<i>Second Supervisor</i>	tbc	
<i>School</i>	Geography, Geology and Environment <input type="text" value="v"/>	
<i>Other member of supervisory team (no more than three KU supervisors in total)</i>	<input type="text"/>	
<i>Specific requirements beyond 2:1 degree</i>	<input type="text"/>	

### Project summary (max 4,000 characters)

Digital elevation models (DEMs) form a primary input to the production of topographic maps, as well as applications involving environmental modelling and monitoring. The focus of this proposal is the evaluation of methods designed to maximise the density of extracted elevation points from photogrammetric software utilising an image matching process. Surface measurements are automatically derived by initially identifying high contrast "interest points" appearing on each photograph. Small image patches surrounding each are then imagedatched using a "normalised cross-correlation" technique. If the optimum matched position generates a cross-correlation coefficient that is greater than a user defined threshold, the point is accepted and 3D position determined.

Key parameters in the above process include the quality of the stereo model, the imaging conditions, the single greyscale camera channel used and the correlation coefficient (for image matching). This proposal aims to investigate the use of different camera channels and derivative image processed products, in combination with changes in the correlation coefficient, on the density of extracted elevation points over vegetated terrain. Specifically it will evaluate the density and quality of the extracted points based upon: (1) the impact of decreasing the image matching correlation coefficient; (2) identification of the best single channel (including derivative products) and (3) imaging conditions (solar elevation and flying height). Final outcomes will produce a set of criteria for best practice.