Title
Optimisation of Digital Photogrammetric Workstations for unconventional photogrammetric applications

Duration
1 year of part-time work (at least 1,144 hours)

Project summary
Digital photogrammetric workstations (DPWs) are typically optimised to process imagery where the image plane of the camera is nominally parallel to one of the coordinate planes. Most DPWs that are used for topographic mapping are optimised for working with aerial photographs - the camera axis is parallel to the Z object coordinate axis. This often implies that algorithms such as bundle adjustment and automatic terrain extraction have constraints that limit the range of useful image formats, orientation angles and processing parameters. Many of those constraints are undocumented or are not clearly described in the user information thus making the application of such DPWs to unconventional projects (where the orientation of the camera axes is not parallel to a particular coordinate axis and adjacent camera axes may be convergent) a difficult, if not impossible, process.

Many of these limitations can be overcome through understanding of and experimentation with the DPW’s software settings and the development of some clever coordinate transformation tools that would overcome the inherent limitations of using them for unconventional photogrammetric projects. Unfortunately, there are no such tools generally available in the market thus limiting the capabilities of such expensive photogrammetric systems to a specific range of applications. Developing these tools will allow existing photogrammetric resources to be exploited beyond their current capabilities thus providing increases in efficiencies and cost-effectiveness.

The objectives are:
1. Understand the constraints imposed by DPWs on their use in unconventional photogrammetric projects. One or two common DPW(s) that are commonly used in the market will be selected for studying in the project.
2. Develop software tools that will overcome or at least minimise those constraints.

Qualifications
At least a Bachelor’s degree in either geomatics, computer science, computer graphics or mathematics.

Desirable skills
• Knowledge of photogrammetry
• Sound knowledge of coordinate transformations
• Computer programming in a compilable language

Contact
Dr. Bruce King
E: bruce.king@polyu.edu.hk
T: 2766 5976

Closing date
The position will be advertised until filled.