



Visitor Seminars - Teaching

Location: Room 113 (also known as L1), 1st Floor
310 Castle Street

School of
Surveying
Te Kura Kairūri

Yushin Ahn

13:00 pm – 14:00 pm
Monday 22nd September 2014

Errors and their propagation in surveying

Abstract:

Surveyors are measurers. How relevant is it to describe the role of surveyors nowadays? It becomes much easier to measure distances, angles and positions when buttons are pushed. Regardless of advancement of measuring technologies, the principle of error and error adjustment stay valid. Furthermore, this theoretical background will promote surveyors from “measurer” to “geospatial data manager”. The seminar will focus on the basic of error theory and its propagation along with least squares concepts.

Cindy Wang

14:00 pm – 15:00 pm
Monday 22nd September 2014

Unmanned Aerial Vehicles (UAVs) based Remote Sensing

Abstract:

The military role of Unmanned Aerial Vehicles (UAVs) is growing at unprecedented rates. Now it is looking to expand into the civilian world. UAVs can be equipped with several onboard sensors, including optical and hyperspectral camera-based, Laser, SAR, IMU, GPS among others. We acquire information about objects and phenomenon on the earth, based on observations of these sensors. The increasing developments in UAVs platforms and associated sensing technologies, adapted to these platforms, offer a broad range of solutions for different applications, not just food delivery and lifesaving. UAVs can be used for agriculture and forestry, security and monitoring surveillance, target tracking, monitoring of natural disasters (e.g. volcanic activity, earthquake or tsunami early detection) environmental monitoring and 3D terrain and object reconstruction.

Robert Odolinski

12:00 pm – 13:00 pm
Wednesday 24th September 2014

An introduction to the least-squares estimation theory and its application to GNSS positioning

Abstract:

In this presentation an introduction to the least-squares estimation theory will be given. Important concepts will include formulation of functional and stochastic models of (linearized) systems of observation equations. The functional model involves constructing the design matrix that links the unknown parameters to the observations, whereas the stochastic model describes the stochastic properties of the observables. The redundancy, i.e. the number of observations minus the number of (estimable) unknowns, use of a proper weight matrix, and their effect on the unknown parameters and the corresponding variance-covariance matrix, will be explained as well. The least-squares validation theory will then be briefly introduced, as to demonstrate the necessity of redundancy to allow for detection and identification of outliers. Throughout the presentation several Global Navigation Satellite Systems (GNSSs) positioning examples will be given, as to show the practical importance of these concepts.