NOTICE OF UNIVERSITY ORAL

GEODESY AND GEOMATICS ENGINEERING

Master of Science in Engineering

Vivek Dey

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Head Hall – ADI Studio (C-level)

Board of Examiners:	**Co-Supervisors:**	**Dr. Yun Zhang, Geodesy & Geomatics Eng.**
		Dr. Ming Zhong, Civil Engineering
	Examining Board:	**Dr. Dave Coleman, Geodesy & Geomatics Eng.**
		Dr. Julian Meng, Electrical and Computer Eng.
	Chair:	**To Be Announced**

A SUPERVISED APPROACH FOR ESTIMATION OF PARAMETERS OF MULTIRESOLUTION SEGMENTATION AND ITS APPLICATION IN BUILDING FEATURE EXTRACTION FROM VHR IMAGERY

ABSTRACT

With the advent of very high spatial resolution (VHR) satellites, spatial details within the image scenes have increased considerably. This led to the development of object-based image analysis (OBIA) for the analysis of VHR satellite imageries. Image segmentation is the fundamental step for OBIA. However, a large number of techniques exist for RS image segmentation. To identify the suitable techniques for urban VHR image segmentation, a comprehensive literature review on urban land cover segmentation is carried out. Based on the review, it is found that the multiresolution segmentation, as implemented in the commercial software eCognition, is the most widely-used technique and has been successfully applied for a wide variety of VHR imageries. However, the multiresolution segmentation suffers from parameter estimation problem. Therefore, this study proposes a solution to the problem of the parameter estimation for improving the efficiency of multiresolution segmentation for VHR image segmentation.

The solution aims to identify the optimal parameters, which correspond to the optimal segmentation. The solution to the parameter estimation derives ideas from the equations related to the merging of any two adjacent objects in multiresolution segmentation. The solution utilizes spectral, shape, size, and neighbourhood relationships for an efficient segmentation. In order to justify the results of the solution, a global segmentation accuracy evaluation technique is also proposed. The solution provides more than 80% accuracy of segmentation of VHR images of different sensors, scenes, and land cover classes.

In order to justify the applicability of solution for real applications, a building detection application, based on multiresolution segmentation from the estimated parameters, is carried out. The accuracy of the building detection is found nearly to be eighty percentages, which suggests an efficient segmentation. Therefore, it can be concluded that the proposed solution is fast, easy to implement, and effective for the real applications.

Faculty Members and Graduate Students are invited to attend this presentation.