NOTICE OF UNIVERSITY ORAL

GEODESY AND GEOMATICS ENGINEERING

Master of Science in Engineering

John Fleming

September 29, 2004 @ 3:00 pm Head Hall – E 11

Board of Examiners:	**Co-Supervisors:**	**Dr. Yun Zhang, GGE** **Dr. David Wells, GGE**
	Examining Board:	**Dr. John Hughes-Clarke, GGE** **Dr. Dave Monahan, GGE** **Prof. Glen Jordan, Forestry & Env. Mgmt**
	Chair:	**Dr. Sue Nichols, GGE**

Design of a Semi-Automatic Algorithm for Shoreline Extraction using Synthetic Aperture Radar (SAR) Images

ABSTRACT

The coastal zones are one of the most changing environments in the world. The coast takes up a big portion of the Chilean territory, which results in one of the highest ratios of coastal kilometers to territory per km^2 in the world.

The capability for all weather, day/night-imaging acquisition, short revisit periods and global coverage makes the SAR images a powerful remote sensing tool for mapping or maps updating, especially in changing environment such as the coastal zones.

Over coastal areas, the nautical chart is the most usable source of information for navigational, military, planning and coastal management purposes. One of the most important features in nautical charts is the coastline, which constitutes the physical boundaries of oceans, seas, straits and canals.

Digitizing is a very tedious and time-consuming operation. The development of a semiautomatic algorithm to detect shoreline is a necessary task for nautical chart production in the Chilean Hydrographic and Oceanographic Service, saving a big amount of time in the process of coastline digitalization, which currently is achieved manually.

Previous works have achieved good results in shoreline extraction. But, those works can fail in areas with high local environmental noise caused by the rough sea surface.

After identifying the general steps governing the detection of shorelines in SAR images, this thesis proposes a new technique to enhance land-water boundaries called the Multitemporal Segmentation Method. Also, the iterative application of windows to get rid of the noise over the sea surface is proposed to achieve land-water separation.

After detecting and vectorizing the coastline, the bias in the delineation of the coastline is acceptable, reducing the offsets towards the sea if applying common filters.

Depending on the application and the scale of the final product, the analysis of the operator is still very important in this semiautomatic method. The extracted coastline requires a final examination.

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