



# **NOTICE OF THESIS PROPOSAL PRESENTATION**

**Geodesy and Geomatics Engineering  
Doctor of Philosophy**

**Marco Mendonca**

**Monday, June 4, 2018 @ 2:00 pm  
Head Hall – Room E-11**

Supervisor: Marcelo Santos, Geodesy and Geomatics Engineering  
Supervisory Committee: Monica Wachowicz, Geodesy and Geomatics Engineering  
Brent Petersen, Electrical and Computer Engineering

Chair: TBA

## **AVAILABILITY IMPROVEMENT OF KINEMATIC PRECISE POINT POSITIONING IN URBAN AREAS USING WI-FI RECEIVED SIGNAL STRENGTH MATCHING AUGMENTATION**

### **ABSTRACT**

Seamless positioning is a recurring challenge among the scientific community. The current technologies allow developers to work with multiple signals in parallel and solve systems of equations that a decade ago would not be handled in real-time. In this context, this research aims to explore the possibility of integration between absolute carrier-phase positioning and a signal-of-opportunity candidate: Wi-Fi networks. The concept of signal-of-opportunity, hereafter SOOP, refers to any source of information that may be used to derive positions, even though it was not specifically designed for that. By developing a mathematical model based on a particle filter able to absorb information from SOOP sources for positioning purposes and, by the means of this model, decrease the initial convergence and reacquisition times of the Precise Point Positioning, a new window of applications can be conceived. Since the urban environment is one of the most challenging areas for carrier-phase positioning, and, at the same time, the areas that are usually most covered by Wi-Fi signals, this combination of techniques shows an interesting potential to improve availability and quality of absolute positioning solutions. Currently, literature is not settled on the potential of this integration, therefore, creating a need for more comprehensive developments and tests to be performed in this scope. By taking advantage of UNB's Geodesy and Geomatics Department long-standing tradition on Precise Point Positioning – an absolute carrier-phase positioning method – this research proposal is jumpstarted, requiring the development of the data collection system, and the integration algorithms, followed by an analysis of the outcomes.

**Faculty Members and Graduate Students are invited to attend the presentation**