SMART RESCUE NAVIGATION SYSTEM
FOR FIREFIGHTERS

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Bachelor of Engineering

JULY 2014

ACKNOWLEDGEMENT

In the Name of Allah, the Most Merciful, the Most Compassionate all praise be to Allah, the Lord of the worlds; and prayers and peace be upon Mohamed His servant and messenger.

At first, it's an excellent opportunity to express my sincere regards to UiTM University for directing me towards the completion of my degree.

Foremost, I owe my sincere gratitude to my supervisor Dr. Nur Idora Abdul Razak, the person who assisted me at all stages of my work and offered me unlimited help I needed. I would also like to show my deepest tanks for all my fellow classmates who created a challenging environment for me and help me challenging myself to be a better person.

Last but not least, my truthful thanks continues to my family, specially my parents who had encouraged me at all times, stood beside me in all my live, supported me spiritually and financially and gave me all the help I needed throughout my degree. We are forever indebted to our parents, who have always kept me in their prayers, I will not forget what they have given me.

Knowledge is power and unity is strength.

[Ebrahim Abdulnabi Hadi Mahdi]

ABSTRACT

The purpose of this project is to develop a Smart Rescue Navigation System (Smart RNS) for tracking of the first responders, such as firefighters, often operates in extreme environments and the possibility of getting lost in a blazing building is a hazard firefighters have to face during rescuing process, for instant in environments where the GPS signal does not work or absent (e.g. inside buildings or underground areas).This system (Smart RNS) design to help track firefighters so that the incident commander could dictate an escape route to the disoriented rescuers over voice radio. The system consists of portable units (PUs) which can be attached to the rescuers and a fixed unit (FU) set up near the scene and monitored by an incident commander. The PU is equipped with inertial measurement unit (IMU) this inertial sensor provides three-dimensional (3D) that uses gyroscope, accelerometer and magnetometer to track movements and send the data wirelessly to the fixed unit (FU). The received data will be processed by FU and display sites rescuers using Kalman filter. This Smart RNS has a potential to replace the use of ropes and hoses by the firefighters to navigate in near black conditions. It is expected that the system provides great challenges to save rescuer's lives and time thus prevent fatalities.

Keywords — Smart rescue navigation system, indoor navigation

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