Positioning and communication Technologies for the Underground Mine IoT Application

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# ABSTRACT

Mine Internet of Things (MIoT) has been intensively discussed in recent years. Positioning technology is the key for some MIoT applications, especially in underground mining environments for ensuring the safety of mine workers. It is also a critical technological capability in resolving mine productivity bottlenecks, which has a great economic impact in Australia. Australia is one of the world’s largest mining nations and a significant player in mining-related research and development. To support the growth of the mining sector, innovative technologies need to be developed, with underground positioning an important though significant engineering challenge.

This paper introduces a robust high accuracy positioning and a cost effective communication system for underground mining environments to meet the requirements of worker safety and mine efficiency improvement. Several technologies which could be part of the “mix” in the solution to the challenges have been identified. RF plus IMU, multi-sensor integration and geomagnetic field positioning are the technologies investigated. A Bluetooth Low Energy based communication method is developed.