Radio-Frequency Identification (RFID) Based Smart Helmet for Coal Miners

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Abstract : Hundreds of miners die from mining accidents each year due to poisonous gases found underground mining areas. This paper proposed an idea to protect the precious lives of mining workers. A supervising system is designed which is based on ZigBee wireless technique along with the smart protective helmets to detect real-time surveillance and it gives early warnings on presence of different poisonous gases in order to save mineworkers from any danger caused by these poisonous gases. A wireless sensor network is established using ZigBee wireless technique by integrating sensors on the helmet, apart from this helmet have embedded heartbeat sensor to detect the pulse rate and be aware of the physical or mental strength of a mineworker to increase the potential safety. Radio frequency identification (RFID) technology is used to find the location of workers. A ZigBee based base station is set-upped to control the communication. The idea is implemented and results are verified through experiment.