Smart Emergency Response System for Gas Leak Fire Hazards

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Abstract: *The Internet of Things pertains to connecting currently unconnected things and people. It is the new era in transforming the existed systems to amend the cost-effective quality of services for the society. To support Smart city vision, Urban IoT design plans exploit added value services for citizens as well as administration of the city with the most advanced communication technologies. To make emergency response real time, IoT enhances the way first responder and provides emergency managers with the necessary up-to-date information and communication to make use those assets. IoT mitigates many of the challenges to emergency response including present problems like a weak communication network and information lag. In this paper it is proposed that an emergency response system for fire hazards is designed by using IoT standardized structure. To implement this proposed scheme of low-cost Espress if wi-fi module ESP-32, Flame detection sensor, Smoke detection sensor (MQ- 5), Flammable gas detection sensor, monitoring display, solenoid valve, and one GPS module are used. The sensors detect the gas leak and alerts the Central control emergency rescue Team like fire departments by sending the hazard location to the cloud-service through which all are connected. A graph mapping scheme and a new safe evacuation route algorithm for safe emergency evacuation assistance, with the aid of Internet of Things(IoT). The gist of our approach is that people are not allowed to pass through or even go towards any area where fire or toxic gas is detected by controlling the direction signals installed on exit signs. The experiments performed with our methodology shows that the proposed technology may be able to save more lives.*

Keywords: Gas leak, Sensing element, Node separation, Live data monitoring, Control unit, Emergency evacuation mapping