Project Design Phase 2
Technology Architecture

Team ID   PNT2022TMID06812

Project Name   IOT based safety gadget for child safety monitoring and notification

Maximum marks 4 marks

GPS is a common and available technology; however it is unreliable and should not be expected to work for indoor applications. Outdoor coverage is expected almost everywhere without a roof; but indoor accuracy suffers if coverage is available at all. 20 It is possible to estimate the relative position of a child using only software & the WiFi landscape. Related work allows a WiFi enabled device to estimate its own position.

The potential of this technology is extensive. However the database of the latest WiFi landscape has to be kept updated for the positioning to work accurately. The application of such software on the child node means positioning could work indoors as well as outdoors. The system uses existing infrastructure; the WiFi access points that the technology uses to locate itself are quite common. Costs are lowered for stakeholders in the sense that less hardware is required.

However that is not to say that coverage will be exclusively guaranteed everywhere. The needed dense coverage is most likely available inside modern buildings. Related work [3] uses RFID gates to monitor designated areas such as entrances and exits. These "monitoring points" can be effective however the RFID working range limits them. The child has to pass through the gate at close proximity for the signal to be picked up.

Just like theft alarm gate systems in shops. WiFi can be used to substitute RFID technology to create monitoring points; WiFi has the benefit of having a larger working range. Sentinels are nodes responsible for scanning the WiFi devices that pass through a monitoring point. While the child is emitting a WiFi beacon and happens to walk past a Sentinel, this beacon can be sent to

and displayed on the parents" smartphone. Since the position of the sentinel is known, the position of the child is known as a radius around the Sentinel (ranging). If the beacon is picked up by at least 3 Sentinels, the Child Node"s position can be trilaterated relative to the fixed position of the Sentinels