FRAS: Preventive Alert System for Active Shooters in Schools

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The Federal Bureau of Investigation (2024) defines an active shooter as an individual actively engaged in the killing of people in a confined and populated area, generally using firearms. The FBI reports that from 2019 to 2023, 229 active shooter incidents occurred. The primary objective of this project was to develop a device that facilitated communication between school staff and local authorities during emergencies, particularly in active shooter incidents. The research questions were: How could response time be minimized during active shooter incidents in schools? Is it possible to design and develop an accessible device that reduces response time in an active shooter emergency while simultaneously improving the communication between authorities and school staff? The hypothesis proposed that the response time can be minimized during active shooter incidents in schools, designing and developing an accessible device that will improve the communication between the authorities and school staff. The prototype was developed using various technologies, including Arduino, Raspberry Pi, the Python programming language, and the Message Queuing Telemetry Transport (MQTT) protocol. During the experimental phase, a controlled drill was conducted with two groups, A and B, placed in distinct emergency scenarios across multiple school environments. The results suggest that the proposed system significantly improved response times in critical situations, highlighting its potential as a valuable tool when integrated with proper training for the educational community.

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