FIREFLY: Dynamically Deployable Situational Awareness Platform for Emergency Events

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Challenge

Offensive fire response operations within large buildings require first responder teams to navigate complex, unfamiliar floor plans in hazardous conditions with limited visibility. Determining the location of responders that become lost or disoriented in these buildings constitutes a significant challenge for Incident Commanders, as they are responsible for coordinating rescue efforts with limited information.

FIREFLY Platform

FIREFLY is a dynamically deployable, situational awareness platform that gives Incident Commanders real-time visibility into the locations of on-scene personnel as well as environmental conditions during emergency response operations. FIREFLY is composed of inexpensive ***wearable devices***, a real-time, ***AI & analytics engine*** for receiving, storing and applying machine learning techniques to augment on-scene decision making, and a game-engine based ***command and control dashboard*** to render on-scene personnel locations and evolving environmental conditions. We have also integrated the use of our environmental monitoring devices into drone swarms that can be dispatched quickly at a scene to identify airborne contaminants in an area.

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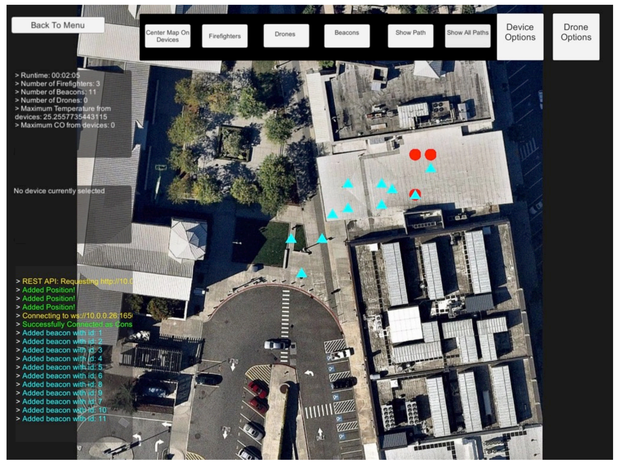
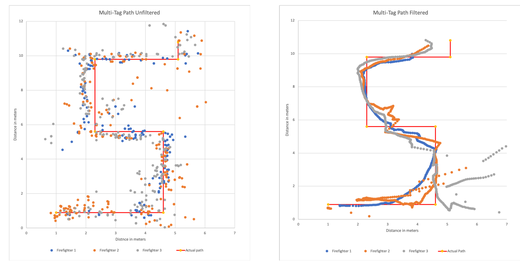
Enhanced Operational Visibility For Incident Command

FIREFLY Command Tablet enables real-time visibility of environmental conditions during emergency response events. AI-based analytics are available to augment IC decision making, accelerate response operations, and adapt to real time threats. Below, responders (red dots) are tracked during a search operation in an urban building.



Field testing wearable location tracking badges and autonomous drone environmental monitoring during live house fire. Right: FIREFLY Command Tablet view of airborne contaminants measured in real-time during house fire event. Deploying drones and rendering environmental conditions uses the same Command interface for personnel tracking and analytics.

Accurate Indoor Tracking



Left: Raw indoor location tracking relative to ground truth (red line) using dynamically deployed anchors. Right: Indoor location tracking using patent-pending location tracking pipeline and dynamic anchors. Accuracy within 1m.

HazMat Visibility

Acknowledgements

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