



Improving Escape Times During a Fire

ENHANCING A FIRE DETECTION SYSTEM



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SUMMARY

This year's Fire Prevention Week theme is about making every second count, because seconds can mean the difference between escaping from a fire or having lives end in tragedy. OneEvent has developed a report describing how machine learning algorithms are enhancing fire detection systems to improve escape times and reduce false alarms.

Three minutes. The same amount of time it takes to make coffee, schedule an appointment, or send an email. Imagine the building you are in starting on fire and having to get to safety in less than three minutes. That's all the time it takes for a modern structure to burn, according to two recent studies by Underwriters Laboratories (UL) and the National Research Council of Canada (NRC). These same studies also concluded older structures took 17 minutes to burn.

The ability to recoup 14 minutes of escape time is vital to improve the risk of dying in a fire. Today's average smoke/heat alarms are designed to turn on a loud horn when elevated smoke, or heat levels, are detected at one single point in your building. Some believe they are intended to detect a fire in these areas, but they really warn you before the fire starts, or at least spreads. Having smoke alarms used to be one of the best early warnings you can buy. Today, there is something better.

OneEvent set out to create a cloud-based analytical fire detection engine to answer three things about fires inside buildings: 1) Where and when did the fire start? 2) How fast is the fire moving? and 3) Where are the people?

OneEvent has conducted several studies on its new product to measure fire evolution in various building scenarios using ordinary wireless and battery-operated smoke/heat alarms, carbon monoxide alarms, humidity sensors and temperature sensors to perfect a predictive software algorithm to determine the early severity and probability of a structure fire. The solution is a complete system that predicts and grades a fire up to 21 minutes before the smoke alarm is activated.

Starting in February 2015 and concluding in May 2017, OneEvent conducted testing inside four condemned structures and a technical training facility. It also completed two UL fire research tests. The purpose of these studies was to design, develop and validate the software analytics that could aggregate the data, statistically analyze the results, and create methods of predicting fires based on various fuel loads. The studies were developed in conjunction with the Mount Horeb Fire Department, Chippewa Valley Technical College, and UL.



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INTRODUCTION

The public's safety is guarded by the requirements of NFPA 72, which specifies "the application, installation, location, performance, inspection, testing, and maintenance of fire alarm systems, fire warning equipment and emergency warning equipment, and their components." Federal, state, and local municipalities throughout the United States have adopted the NFPA 72 as a standard in the enforcement of fire code regulation. Further, the standard states that all smoke/heat alarms must be assessed for compliance to the minimum performance requirements as specified in ANSI/UL 217, "Single and Multiple Station Some Alarms" and ANSI/UL 268, "Smoke Detectors for Fire Alarm Systems."

These standards ensure the appliance, as designed, will meet the minimum performance requirements to warn occupants of a potential fire within the building. Building codes specify smoke alarms should be placed in sleeping areas, kitchens (away from cooking appliances), living areas and stairways. Ultimately, every building floor should have at least one smoke alarm installed. A smoke alarm should also be placed in parking areas attached to living spaces, and in basements, sunrooms, attached swimming pools and spa areas.

These standards — as applied to single-station alarms designed to be installed inside buildings — have been shown to reduce the risk of fire deaths, but they fail to improve egress times. OneEvent is suggesting an overbuild product, such as the OnePrevent system, is necessary to properly augment misguided regulations so egress times can be improved.

To receive the full 44-page research paper, please contact OneEvent Vice President of Engineering & COO Dan Parent via LinkedIn or at d.parent@oneeventtech.com.