Video-Enabled, AI-Based Fire Detection

A system that can be integrated into existing security systems and can quickly detect all five classes of fire, even in early stages

Technology Overview

Conventional fire and smoke detectors depend heavily on the environment of their use and the type of fire event detected. NYU has developed a fire detection system that can make use of existing CCTV cameras to rapidly detect fires and smoke. NYU's fire detection system brings together advancements in Artificial Intelligence, image processing, computer vision, and IoT platforms to make this possible. The NYU detection system has developed and integrated several state-of-the-art object detection AI models to create a system that is capable of detecting all five classes of fire designated by National Fire Protection Association (NFPA). This system can also detect fire in its early stages, which many other systems are unable to do.

A novel end-to-end IoT cloud-based system has also been demonstrated that can receive real-time video streaming (RTSP/RTMP/SDP) from most CCTV cameras, extract the frames, feed them to multiple object detection models simultaneously, and compute the probability for the presence of fire and smoke in inputs. Based on the custom risk thresholds and the criterion developed, the outputs are compiled programmatically into a video clip that is sent to the user via email and messages automatically in real-time. In this way, a superior fire detection system can be integrated with existing building security systems and allow for a much more rapid and appropriate response.

Benefits

- Can detect all major types of fires
- Detection in early stages
- Can be easily integrated with existing security camera systems
- IoT implementation allows for a more rapid and suitable response

Applications

- Fire detection
- Potential additional applications:
  - Face detection for person search
  - Gun detection
  - Intrusions
  - Theft/robbery alarm
  - And other types of behavior recognition

IP Status

Provisional patent application pending

Technology ID

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Category

Engineering & Physical Sciences/Security Software & IT/Artificial Intelligence (AI)

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