

**FlyingFox**

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# Introduction

In the age of information we currently live in, the value of collection and usage of information is growing in exponential fashion. Even large-scale organizations can cough up millions and sometimes billions of dollars to acquire a huge data set that can assist in market predications, user preferences .Moreover, Artificial Intelligence (AI) will define the next generation of software solutions. Moving from the age of information to the , the impact of AI is. Therefore, it is high time AI and machine learning is integrated into drone technology, not only for recreational activities but rather for rescue missions and potentially saving lives.

Enter FlyingFox: an autonomous robust quadcopter drone equipped with an HD camera and a powerful on-board AI module – Google Edge TPU - which is able to identify human gestures and instantly sends a summary of the gathered information through the Sigfox network to the fire brigade members before they even arrive to the location of the fire outbreak.

# Problem Statement

The average response time of fire brigades in Europe and the United States is in the region of 6 to 8 minutes from the start of the dispatch call to the arrival of the fire brigade to the location of the fire outbreak. In this period of time, very minimal – if not completely lacking - information is available to the dispatched fire brigade. Having already asked a leading figure in the fire brigade in Hamburg, Germany, it was confirmed that it is an issue to be

“One of the main problems we face as firefighters is the lack of information during dispatch” – Dann Annan, Fire Brigade Lead, Hamburg, Germany.

# Solution

The proposed solution is to have a robust, versatile and autonomous drone which can immediately fly to the fire location, bypassing all traffic

# Technologies and Components

## The Flight Management Unit

## Google Coral Edge TPU

The Core Edge

Edge TPU Module

CPU: i.MX 8M Applications Processor (quad Cortex-A53, Cortex-M4F)

GPU: Integrated GC7000 Lite Graphics

ML accelerator: Google Edge TPU coprocessor

RAM: 1 GB LPDDR4

Flash memory: 8 GB eMMC

Wireless: Wi-Fi 2x2 MIMO (802.11b/g/n/ac 2.4/5GHz) Bluetooth 4.1

Dimensions: 48 mm x 40 mm x 5 mm

Baseboard

Flash memory: MicroSD slot

USB: Type-C OTG Type-C power Type-A 3.0 host Micro-B serial console

LAN: Gigabit Ethernet port

Audio: 3.5 mm audio jack (CTIA-compliant) Digital PDM microphone (x2)

2.54 mm 4-pin terminal for stereo speakers

Video: HDMI 2.0a (full size) 39-pin FFC connector for MIPI-DSI display (4-lane) 24-pin FFC connector for MIPI-CSI2 camera (4-lane)

GPIO: 3.3 V power rail 40 - 255 ohms programmable impedance ~82 mA max current

Power: 5 V DC (USB Type-C)

Dimensions: 88 mm x 60 mm x 24 mm

## Sigfox

# Workflow

# Outlook