krattworks

autonomous system to deliver rapid situational awareness for firefighters, rescue workers and police.

krattworks.com

The global problem

4 – 5 million
landscape fires

400 – 500 million ha
area damaged

300 000 deaths
approximately

500 million tonnes of CO^2 emitted
(accounts for 15% global CO^2 emissions).

Every year, landscape fires destroy globally an area equal to 50% of US territory.

Cost in total: $91 billion

Current disadvantages

! Many first responder teams do not use modern technology at all, because it brings more hassle than benefits.

Limited operational range.

Information can not be shared during flight.

Human input necessary for object detection.

Information transformed to a map manually.

Unfortunately **police and rescue teams have to rely on outdated technology** in situations where every wasted minute can cost human lives.

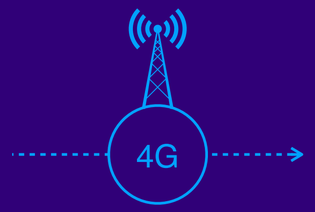
Current off-the-shelf drones have short range and aerial data can be processed only after the drone has landed. They are not efficient in time critical situations where large area monitoring is necessary.

Once a landscape fire has reached a certain size, humans cannot stop it. Therefore, early detection and rapid situational awareness are key to stop landscape fires from escalating out of control. Similar principles apply with any type of security mission that needs to be localized or monitored in the most efficient way possible.

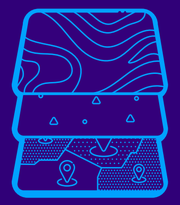
How we can help

KrattWorks detects the location of the fire line without human input and shares the collected data instantly to multiple users.

KrattWorks offers a system that delivers rapid situational awareness for firefighters, rescue workers or police. We use machine vision on board of the drones to detect the fireline or missing persons. Our machine vision platform can also be used to detect other objects of interest: cars, trucks, number plates, flooded areas etc…



Mobile cellular connectivity on board of the drones allows us to send the collected data into the server and export it instantly to any platforms needed (ATAK, Google Maps or any proprietary solution).



In our server we can integrate the collected aerial data with other information.

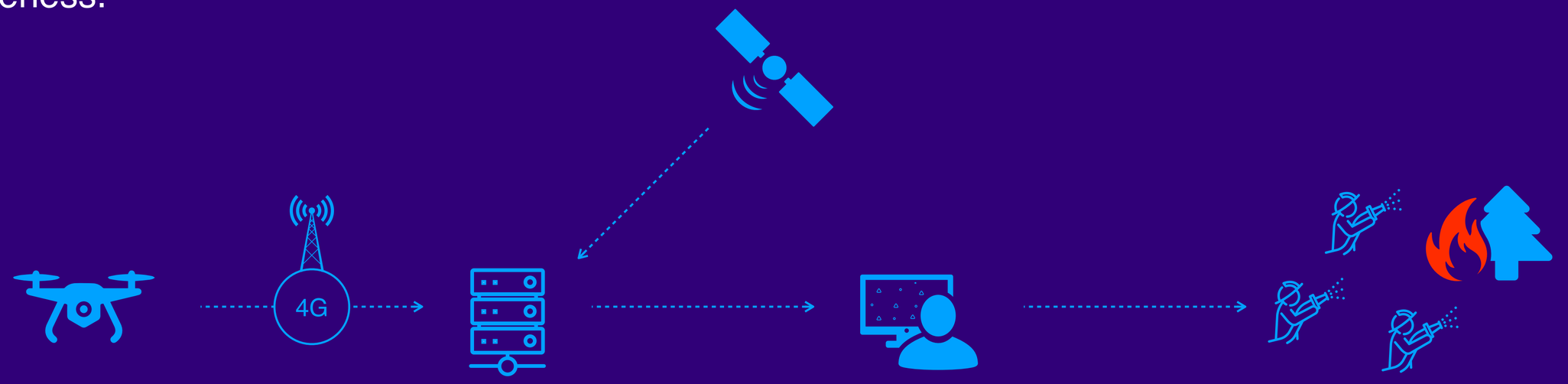
In firefighting we do not just show the location of the fire on a map, but also the wind speed and direction, landscape elevation module and how much burning material there is. This enables firefighters to act quickly and contain the fire before it expands out of control.

In rescue missions we can show the flooded area, location of a missing person, blocked roads etc.

The solution

! Off-the-shelf consumer drones are reliable, but with limited features - custom made professional drones are expensive and complicated to use.

We eliminate two of the most crucial problems for police and rescue teams – outdated technology and lack of situational awareness.



Drones monitoring the area and streaming data.

Data combined with satellite images, weather maps etc.

Result: real-time situational maps and up to 8h predictions for fireline.

Impact: more precise actions from rescue teams prior to escalation of fire.

Our product

Unlimited range of operation within mobile network area.

Real-time data sharing to multiple recipients.

Machine vision and automated object detection.

Constant situational awareness – broad picture updates automatically.

KrattWorks has developed a smart drone controller with a mobile communication module and artificial intelligence. It allows for drones to be operated over an unlimited range, using machine vision & AI on the board of the flying drone and the collected data to be distributed to multiple users in different rescue teams, mission control centre and authorized 3rd parties.

Clip-on gimbal

Gimbal with machine vision module

IR + EO gimbal with integrated machine vision module offers machine vision capability to the drones you already have!

Specs

IR camera: 640x480 px 8-14µm ULIS Gen 2 sensor with 17µm px.pitch.
Lens: 35 mm (17.7°x13.3°)
8X digizoom

EO camera: 1/1.2” IMX485 starlight 8.3 MP sensor, 2.9 µm pixel size
Lens: 35 mm (21° x 16°)
8X digizoom

Machine vision module:
Jetson TX2 integrated into the gimbal.

Total weight: 850 g

Complete system

Drone with on-board KrattWorks machine vision module

Specs

Size: 690 mm
Flight time: 60 min
Range: unlimited

Wind resistance: 13 m/s (Force 5)
Rain proof: 50 mm / 24h
Temperature proof: -40°C - 60°C

Battery Smart 4S 30 Ah Li-Ion battery
Airborne systems and equipment comply with European DO-178 aviation standard.
Airborne circuit design and protection comply with IPC3 military standard.

How it works

The operator assigns an area of surveillance for the drone and launches it. From this moment on, the drone can operate independently. It approaches the designated zone and begins to collect and analyse visible imagery.

The processed data of fireline location, intensity and movement is constantly transmitted to the GIS server, where it is combined with other map layers for output. This gives firefighting teams automatically updated situational maps in real time.

The drone can be redirected to another area, given a new assignment, flown back to base or handed over to another operator any time.

What makes us unique?

Our software component distinguishes us from the competitors.

Integrating external data, machine vision and AI will change the way drones are used in many sectors.

Our product can be used out of the box with existing systems already on the market.

Additional markets

Landscape mapping

KrattWorks system is perfect in situations where satellite imagery is too expensive or image resolution is too low.

Defence industry

KrattWorks AI is able to perform surveillance tasks autonomously, which enables it to operate in radio silence.

Infrastructure monitoring

Highways, railroads, shipping routes, construction, power grids need constant monitoring to detect possible flaws or malfunctions.

The company

We help those who help others!

KrattWorks is a winner of the Prototron competition 2019

KrattWorks participates in the ESA Business Incubation Centre Estonia

KrattWorks has recieved a development grant from the Estonian Ministry of Defence.

Established in 2018 with the mission to offer rapid situational awareness to first responders, firefighters, rescue teams and police units.

Funded by Prototron, European Space Agency and a development grant by Estonian Ministry of Defence.

Our first products are already in production.

Our current customers are other defence and robotics companies in Estonia: DefSecIntel, Cleveron, Unsinkable Robotics, Power-UP.

Our team

TÕNIS VOITKA
FOUNDER
Production design
Experienced in product and user-centered design.
LinkedIn

MATTIAS LUHA
FOUNDER
Project management
Experienced in strategic management and marketing.
LinkedIn

KRISTJAN KASK
Customer acquisition
Experienced in customer acquisition and service.
LinkedIn

KNUTH HELEKIVI
Electrical engineering
Experienced in electronics, UAV-s and rapid prototyping

JORMA REBANE
Machine Vision, AI
Strong background in low-latency systems development in robotics.
LinkedIn

TIMO LOOMETS
Machine vision
Talented machine vision specialist
LinkedIn

KRISTJAN MÖLLER
Aeronautical engineering
Lightweight mechanics and composite materials specialist.
LinkedIn

MATTI SILLA
Aerodynamics
Highly qualified aerodynamics and propulsion specialist
LinkedIn

SILVAR LAASIK
Marketing, PR
Strong background in design, marketing strategy and creative direction.
LinkedIn

MARTIN KARMIN
Mechanical engineering
Experienced in aviation, automotive, mechatronics and consumer electronics.
LinkedIn

VEIKO RÜTTER
Programming
Hardware and software development specialist.

VOOTELE AER
Programming
Server, back-end and network programmer.
LinkedIn

krattworks

KrattWorks Ltd
Põhja pst 27a, Tallinn 10415, Estonia
info@krattworks.com

krattworks.com