



## Assisting law enforcement tasks with thermal camera drones

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# Introduction



- ▶ Law enforcement agencies mostly use professional drones to perform various tasks, but the increase in the number of tasks during the pandemic period justified the use of semi-professional drones as well.
- ▶ Another important aspect of this decision was that the personnel managing these drones did not have to be highly trained drone pilots.
- ▶ The software environment that supports drone systems is primarily for research, reconnaissance, monitoring, thereby providing effective assistance to a few staff members and facilitating decision-making and action processes.

# Application of imaging tools on drones

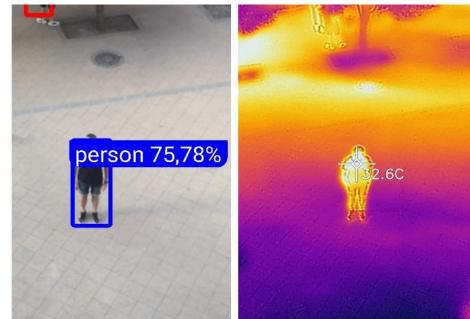


- ▶ Flood protection and dam control
- ▶ Fire protection
- ▶ Object control
- ▶ Performing disaster prevention and law enforcement tasks
- ▶ Rescue tasks
- ▶ Cartography
- ▶ Agriculture
- ▶ Industrial infrastructure inspection

# Drone application during pandemic



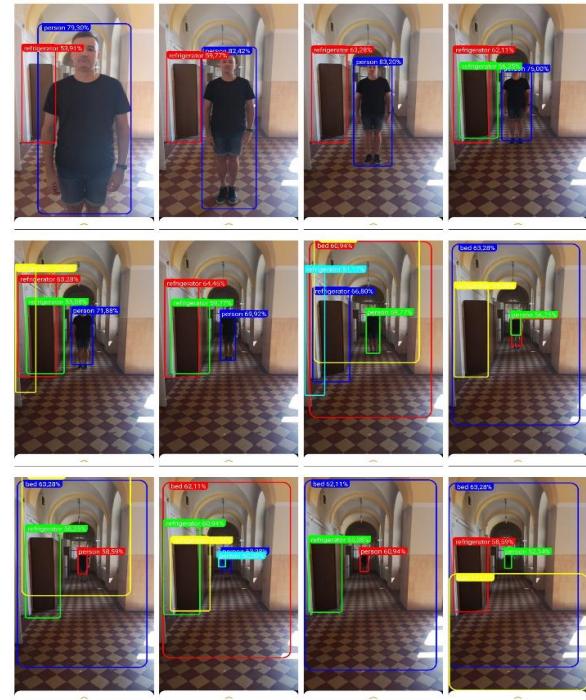
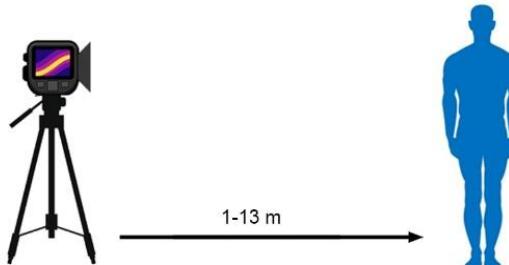
- ▶ Curfew restriction control
- ▶ Transport of essential medical materials
- ▶ Disinfection of public areas
- ▶ Temperature control



# Object recognition depending on distance

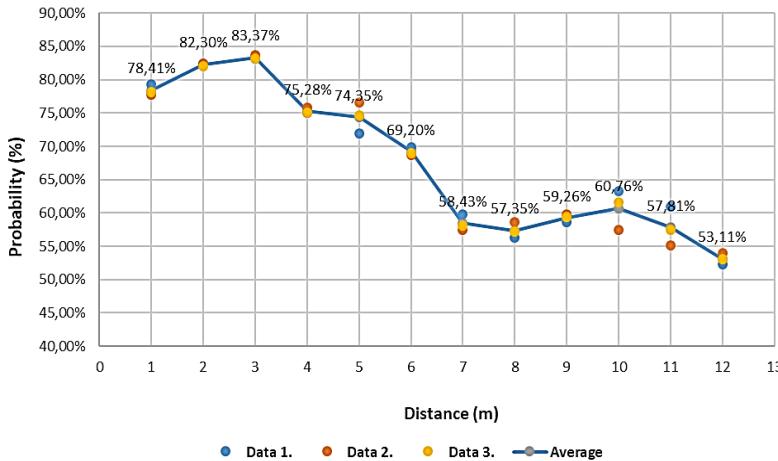


The test was first performed indoors at an ambient temperature of 26.4 °C. The test environment was created in a 15 meter long corridor. The tests were performed in a meter-by-meter resolution, between 1 and 13 meters.



# Object recognition depending on distance

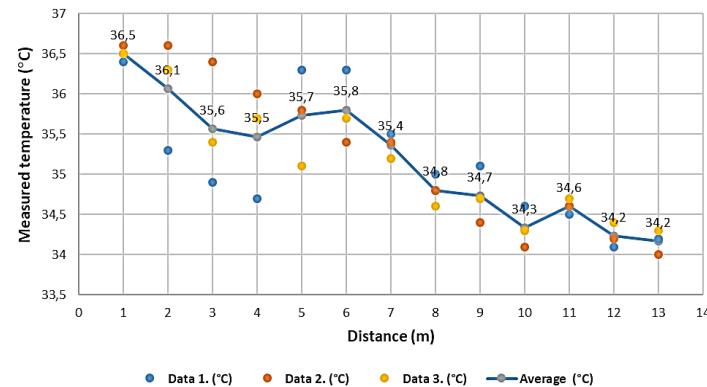
*Measurement data (Human body recognition)*



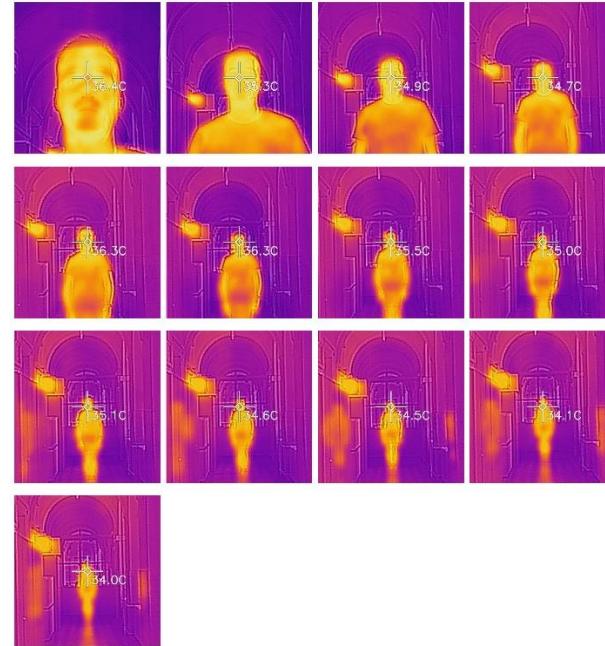
Distance (m)	1	2	3	4	5	6	7
<b>Data 1.</b>	79,30%	82,42%	83,20%	75,00%	71,88%	69,92%	59,77%
<b>Data 2.</b>	77,73%	82,42%	83,70%	75,78%	76,56%	68,75%	57,42%
<b>Data 3.</b>	78,20%	82,06%	83,20%	75,05%	74,60%	68,93%	58,11%
<b>Average</b>	78,41%	82,30%	83,37%	75,28%	74,35%	69,20%	58,43%
Distance (m)	8	9	10	11	12	13	
<b>Data 1.</b>	56,25%	58,59%	63,28%	60,94%	52,34%	-	
<b>Data 2.</b>	58,59%	59,77%	57,42%	55,08%	53,91%	-	
<b>Data 3.</b>	57,22%	59,43%	61,57%	57,40%	53,08%	-	
<b>Average</b>	57,35%	59,26%	60,76%	57,81%	53,11%	-	

# Thermal camera test

Person's facial temperature (Flir application)

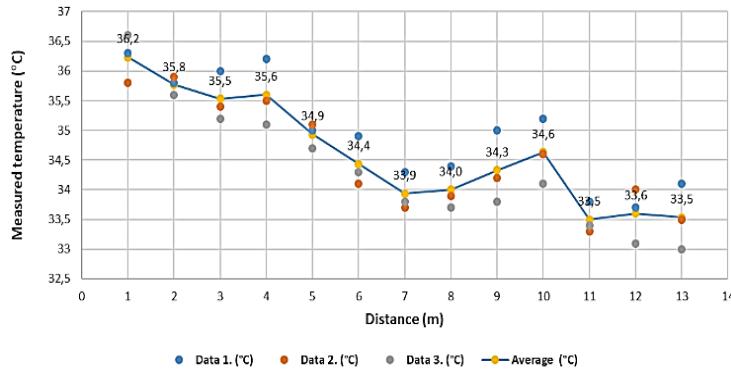


Distance (m)	1	2	3	4	5	6	7
Data 1. (°C)	36,4	35,3	34,9	34,7	36,3	36,3	35,5
Data 2. (°C)	36,6	36,6	36,4	36	35,8	35,4	35,4
Data 3. (°C)	36,5	36,3	35,4	34,9	36,4	35,8	35,2
Average (°C)	36,5	36,1	35,6	35,2	36,2	35,8	35,4
Distance (m)	8	9	10	11	12	13	
Data 1. (°C)	35	35,1	34,6	34,5	34,1	34,2	
Data 2. (°C)	34,8	34,4	34,1	34,6	34,2	34	
Data 3. (°C)	34,6	34,7	34,3	34,7	34,4	34,3	
Average (°C)	34,8	34,7	34,3	34,6	34,2	34,2	



# Thermal camera test

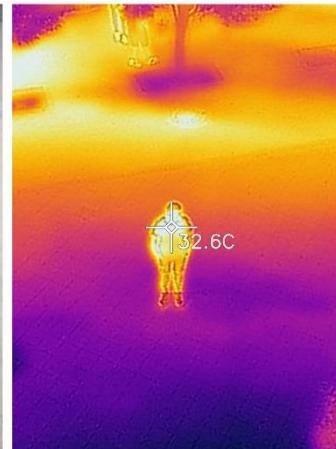
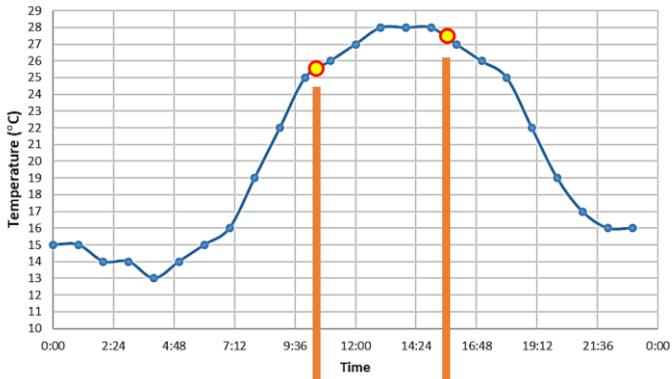
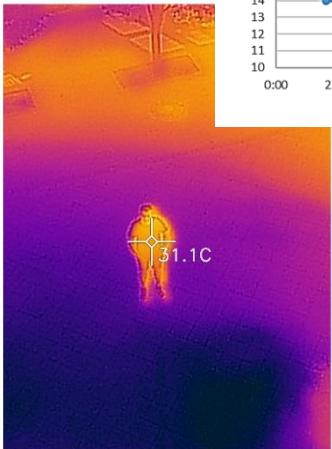
Person's facial temperature (Thermal Camera+ application)



Distance (m)	1	2	3	4	5	6	7
Data 1. (°C)	36,3	35,8	36	36,2	35	34,9	34,3
Data 2. (°C)	35,8	35,9	35,4	35,5	35,1	34,1	33,7
Data 3. (°C)	36,6	35,6	35,2	35,1	34,7	34,3	33,8
Average (°C)	36,2	35,8	35,5	35,6	34,9	34,4	33,9
Distance (m)	8	9	10	11	12	13	
Data 1. (°C)	34,4	35	35,2	33,8	33,7	34,1	
Data 2. (°C)	33,9	34,2	34,6	33,3	34	33,5	
Data 3. (°C)	33,7	33,8	34,1	33,4	33,1	33	
Average (°C)	34,0	34,3	34,6	33,5	33,6	33,5	



# Outdoor object recognition and thermal camera test





## Thank you for your attention

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