

Advanced systems for prevention  
and early detection of forest fires

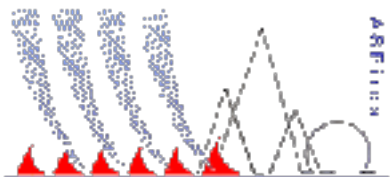
# ASPiRES

Advanced systems for  
prevention & early  
detection of forest fires

Images are from: <https://unsplash.com>

# Multi Sensor Module for Fire Detection based on Cameras

Images are from: <http://www.optixco.com/>



Advanced systems for prevention  
and fire detection in industrial facilities

# Advanced systems for prevention & early detection of forest fires (ASPIres)

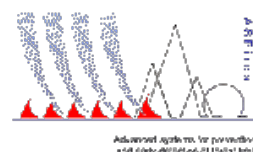
**NCITES**

## **Multi Sensor Module for Fire Detection based on Cameras**

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Agreement No.: ECHO/ SUB/2016/742906/PREV03 by European Commission:  
DG for European Civil Protection and Humanitarian Aid Operations (ECHO)



# ASPIres-GEO

Main Objectives, Components,  
Components Interaction



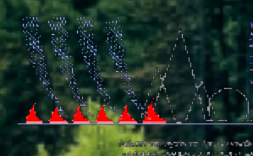


## Main Objectives

ASPIres-GEO is based on already available hardware and software components on the market.

The main objectives are:

- ❑ to build a real model of a stationed monitoring system for early warning of forest fires
- ❑ the model will be used to prove the opportunities of the platform ASPIres

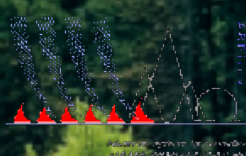




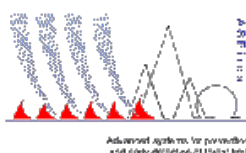
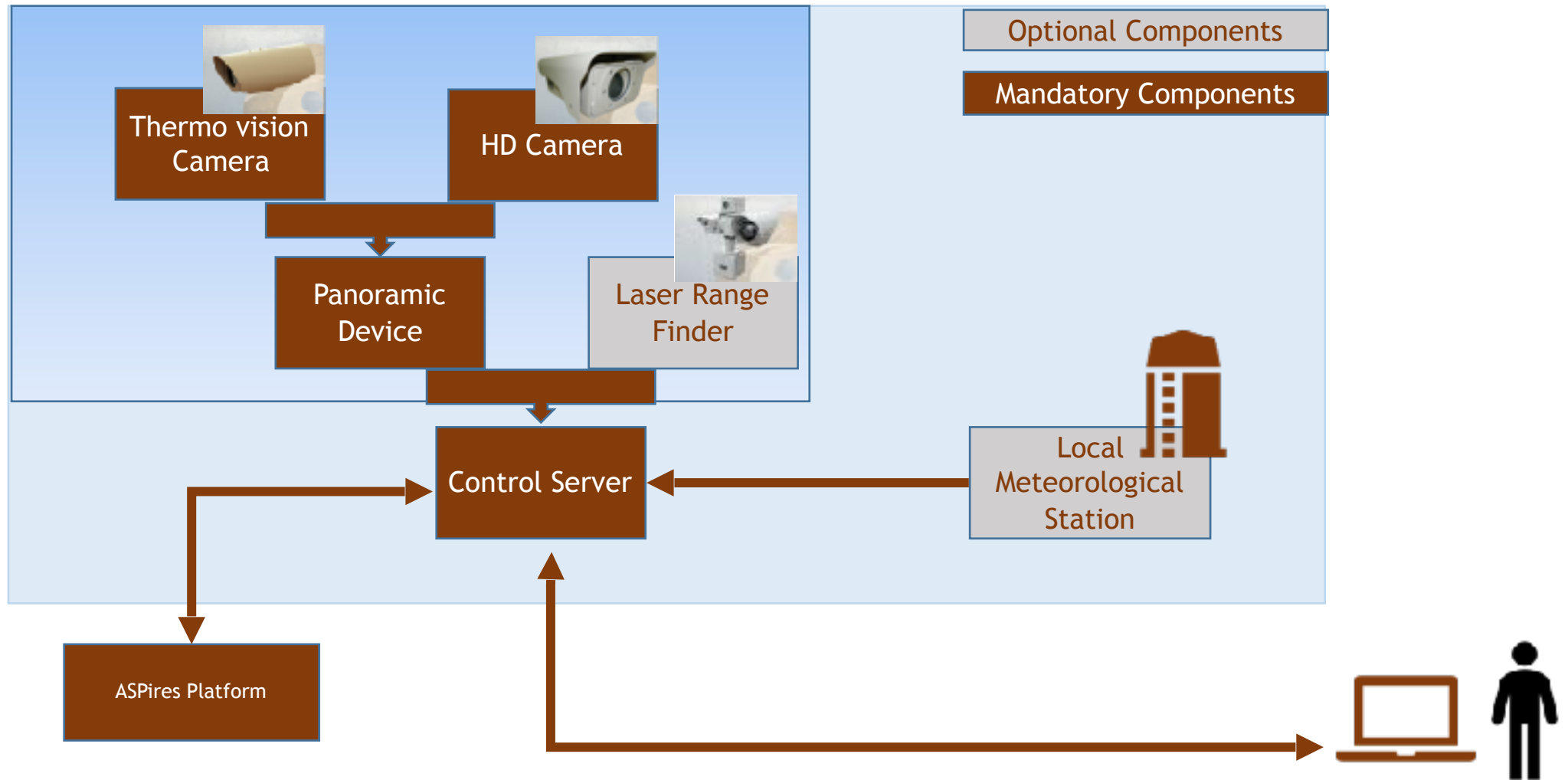
## Components

Studies have shown that the main components of such a module are:

- HD CCD/CMOS and Thermographic cameras
- Pan/Tilt device
- Laser pointer
- Meteorology station
- Intelligent software for fire detection

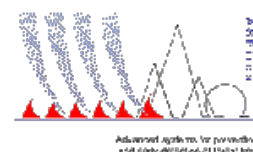


# Components Interaction





- The hardware and software equipment, produced by the Bulgarian company OPTIX, was hired for the experiment.
- The equipment is mounted on the roof of the business building of CANTEK, a Bulgarian company and a member of NCITES.
- <https://aspires-geo.aspires.eu>



Live  
Demo



Panorama

Cptix IPI

Preset: Zone\_10

2018-05-10 14:10:21

Channel 1

DayBreaker96

Preset: Zone\_10

2018-05-10 14:10:21

Channel 2

Log

2018-05-10 14:10:04

Detection: No fire detected, visualizing hottest point (X: 16, Y: 476, T: 32°C).

2018-05-10 14:09:53

Detection: No fire detected, visualizing hottest point (X: 485, Y: 439, T: 21°C).

2018-05-10 14:09:00

Detection: No fire detected, visualizing hottest point (X: 12, Y: 350, T: 31°C).

2018-05-10 14:08:49

Detection: No fire detected, visualizing hottest point (X: 500, Y: 407, T: 48°C).

2018-05-10 14:08:38

Detection: No fire detected, visualizing hottest point (X: 636, Y: 486, T: 33°C).

2018-05-10 14:08:06

Detection: No fire detected, visualizing hottest point (X: 637, Y: 439, T: 30°C).

NVE

C41

CH2

PT

NAVIGATION

330

300

270

240

210

180

150

120

90

60

30

0

90

60

30

0

-30

-60

-90

N

NE

E

SE

S

SW

W

NW

PTZ

PRESETS

TOUR

+

ASpires Vitosha

test

Test\_3

HOME

IR

DAY

FIRE

Digital

-

+

POLARITY

NUC

FOG

On

Off

10





## Paranoma



## Optix IR



Preset: Zone\_04

2018-05-10 15:16:39

T1 22.1d+a (C)



Channel 1

## DayBreaker35



Preset: Zone\_04

2018-05-10 15:16:39



Channel 2

## Log

[2018-05-10 15:16:39] Detection for the detected, visualizing hottest point (X: 290, Y: 478, T: 27°C).

[2018-05-10 15:16:39] Detection for the detected, visualizing hottest point (X: 15, Y: 443, T: 27°C).

[2018-05-10 15:16:39] Detection for the detected, visualizing hottest point (X: 879, Y: 478, T: 22°C).

[2018-05-10 15:16:39] Detection for the detected, visualizing hottest point (X: 0, Y: 471, T: 23°C).

[2018-05-10 15:16:39] Detection for the detected, visualizing hottest point (X: 4, Y: 471, T: 17°C).

[2018-05-10 15:16:39] Detection for the detected, visualizing hottest point (X: 12, Y: 392, T: 26°C).

■ NVS ■ CH1 ■ CH2 ■ PT

PATROLLING (ASPIRES VTCSHAI)

## NAVIGATION



PTZ

PRESETS

FOUR

+

Zone\_01



Zone\_02



Zone\_03



Zone\_04



HOME

IR

DAY

FRE

Digital

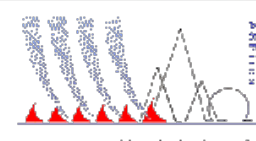
-

+

POLARITY

NUC

FOG

☐ On☒ Off

Advanced systems for protection and safety of the state and the people



Menu "Gallery"

SCREENSHOTS VIDEO FIRE

Name	Date	Size		
day_10-05-2018_07-42-54.mp4	2018-05-10 10:34:38	1.303KB	▶	✕
lr_10-05-2018_07-42-54.mp4	2018-05-10 10:34:38	1.669KB	▶	✕
lr_10-05-2018_10-34-26.jpg	2018-05-10 10:34:26	137KB	▶	✕
day_10-05-2018_10-34-26.jpg	2018-05-10 10:34:26	150KB	▶	✕
day_10-05-2018_07-42-54.jpg	2018-05-10 07:42:55	123KB	▶	✕
lr_10-05-2018_07-42-54.jpg	2018-05-10 07:42:54	83KB	▶	✕

Log

2018-05-10 15:17:50 Detection: No fire detected, visualizing hottest spot (X: 537 Y: 478 T: 27°C)

2018-05-10 15:17:48 Detection: No fire detected, visualizing hottest spot (X: 537 Y: 480 T: 26°C)

2018-05-10 15:17:46 Detection: No fire detected, visualizing hottest spot (X: 537 Y: 478 T: 25°C)

2018-05-10 15:17:28 Detection: No fire detected, visualizing hottest spot (X: 535 Y: 472 T: 27°C)

2018-05-10 15:17:15 Detection: No fire detected, visualizing hottest spot (X: 535 Y: 478 T: 30°C)

2018-05-10 15:17:03 Detection: No fire detected, visualizing hottest spot (X: 535 Y: 478 T: 27°C)

NVIS CH1 CH2 PT

NAVIGATION



PTZ

PRESETS

TCUR

Zone_01	▶	0	✕
Zone_02	▶	0	✕
Zone_03	▶	0	✕
Zone_04	▶	0	✕

HOME

DAY

FIRE

Digital

- +

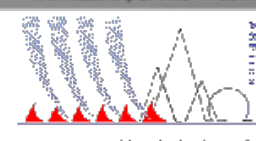
POLARITY NUC FCG

○ ●



Comjcon

ICB SOFTWARE INNOVATION



Advanced systems for protection and safety of the state

OPTIX NVIS v1.2
OPTIX

Panorama

Optix IR

DayBreaker04

Preset: Zone\_10

Channel 1

Settings

GENERALSYSTEMJOYSTICKUSERSNETWORKFIRE SETTINGSNOTES

Fire pre-arm degree:

00

Fire arm degree:

80

Surrounding temperature:

5

SAVE

NAVIGATION

PTZPRESETSTOUR

+

Zone\_01

▶

⊞

✕

Zone\_02

▶

⊞

✕

Zone\_03

▶

⊞

✕

Zone\_04

▶

⊞

✕

HOMEIRDAYFIRE

Digital

-

+

POLARITY

NLC

FOG

☐ Day
☒ Night

Log

2018-06-10 15:18:53

Detection: No fire detected, visualizing hottest point (X: 1, Y: 471, T: 13°C).

2018-06-10 15:18:46

Detection: No fire detected, visualizing hottest point (X: 115, Y: 468, T: 22°C).

2018-06-10 15:18:26

Detection: No fire detected, visualizing hottest point (X: 19, Y: 442, T: 23°C).

2018-06-10 15:18:18

Detection: No fire detected, visualizing hottest point (X: 21, Y: 439, T: 25°C).

2018-06-10 15:18:16

optix opened menu "Settings"

2018-06-10 15:18:13

Detection: No fire detected, visualizing hottest point (X: 538, Y: 478, T: 24°C).

NVIS

CH1

CH2

PT

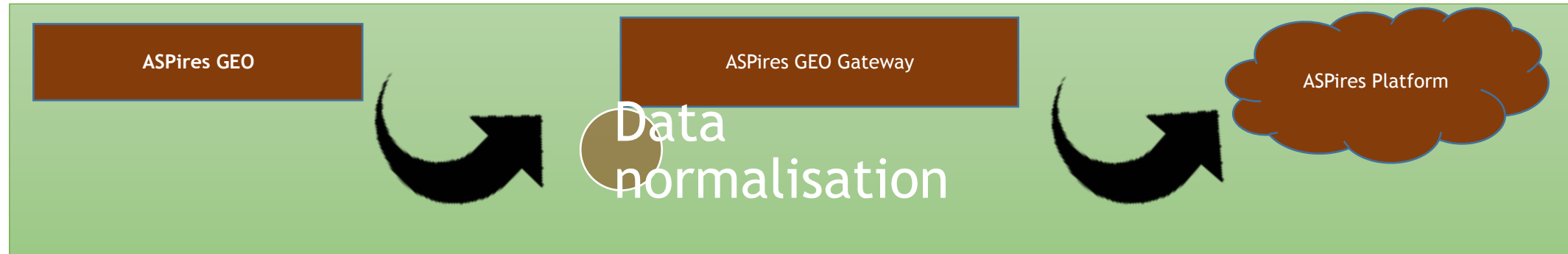
PATROLLING (ASPIRES VITOSHA)

14

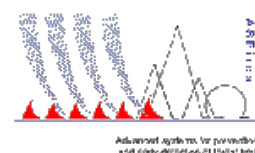
# Basic principles for the use of ASPIRES-GEO



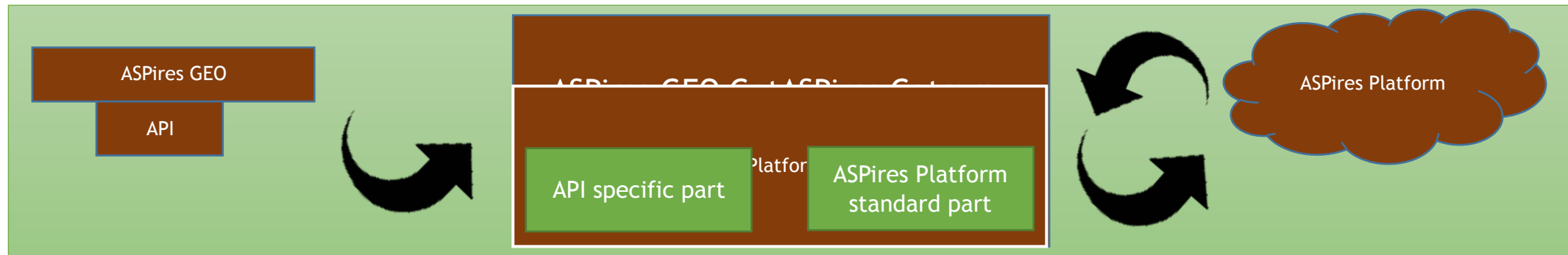
## ✓ First Principle



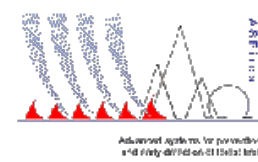
- ❑ The communication between ASPIres-GEO and the ASPIres platform is implemented through an intermediary, called ASPIres-GEO-Gateway.
- ❑ The Gateway concept allows the provision of normalised data to the ASPIres platform.
- ❑ Data normalisation allows their universal use, both individually and in conjunction with data from other types of sensors.

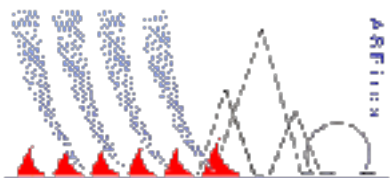


## ✓ Second Principle



- ❑ ASPires-GEO provides an API interface.
- ❑ The API interface is specific to each technical implementation of a monitoring module.
- ❑ Through this interface, the data received from the sensors is transmitted to ASPires-GEO-Gateway.
- ❑ ASPires-GEO-Gateway includes a specialised ASPires Platform driver.
- ❑ This driver is engineered for any existing platform.





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# ASPiRES

## Thank You !