FIRE-AID

FOREST INSPECTION FOR FIRE RISK EVALUATION WITH AI AND DRONES

Dr. Indre Urbanaviciute

FIRE-AID Project Manager

AIDIA, MB

indre@aidia.lt

Funded by the European Union

Funded by the European Union. Views and opinions expressed are however those of the author(s) only and do not necessarily reflect those of the European Union or the European Research Executive Agency. Neither the European Union nor the European Research Executive Agency can be held responsible for them.

AIDIA

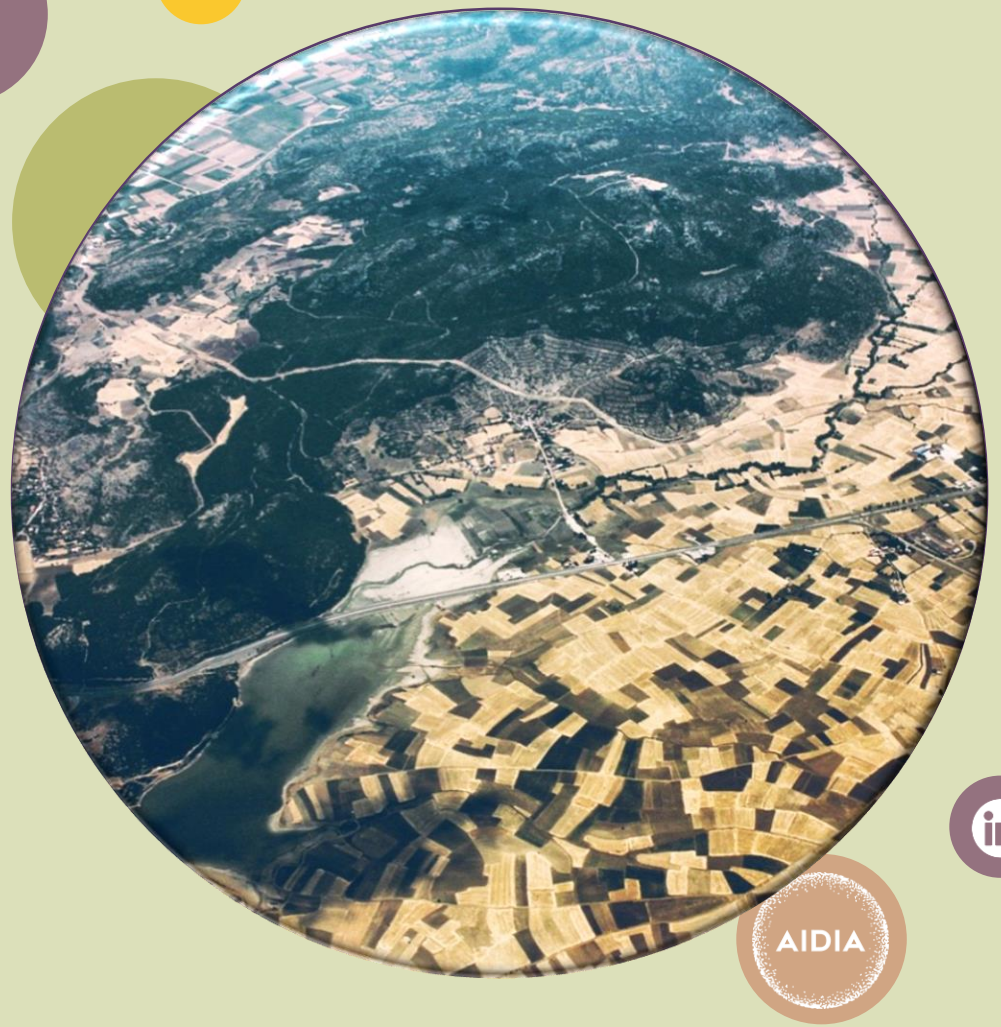
AI-Driven Aerial Intelligence

Who we are?

- Lithuania-based deep-tech startup specializing in AI-powered remote sensing
- Team of experts in remote sensing, AI, GIS, R&D, forestry and environmental sectors

What we do?

- We develop scalable AI-driven solutions for analyzing multi-sensor UAV, aerial, and satellite data enabling intelligent monitoring of forests and other ecosystems



Motivation

Real-world rural challenges to be addressed

HIDDEN WILDFIRE RISKS
Incomplete risk assessments leave rural and urban areas vulnerable to wildfires.

SLOW DAMAGE ASSESSMENT
Lack of post-fire analysis delays recovery and restoration.

DELAYED FIRE DETECTION
Slow hotspot identification leads to uncontrolled fire spread.

WASTED RESOURCES
Ineffective planning leads to inefficient wildfire management.

EXCESS WILDFIRE FUEL
Poor vegetation management increases wildfire intensity.

INEFFICIENT POST-FIRE RECOVERY
Poor soil zoning results in failed forestation efforts.

FIRE-AID

WILDFIRE RISK ASSESSMENT

Continuity of Vegetation tool (BC3)

Characterization of Wildland-Urban Interface tool (BC4)

ACTIVE FIRE MONITORING

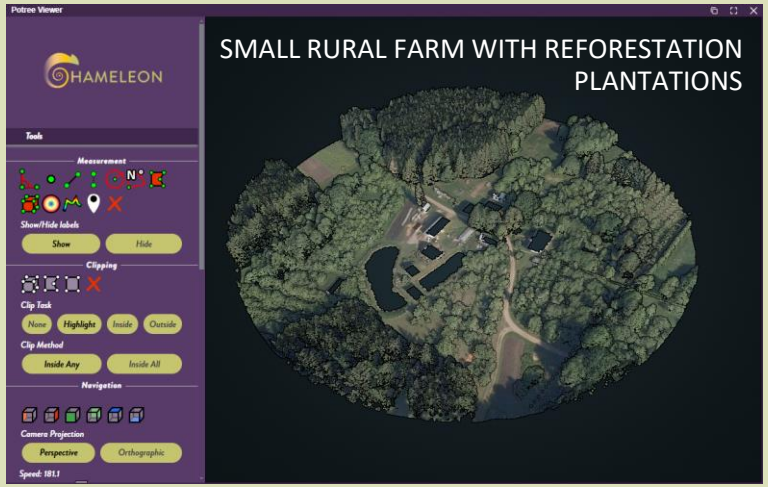
Hotspot Identification at the Beginning of Wildfire tool (BC5)

POST-FIRE RECOVERY

Soil Zoning Based on Bare Soil Reflectivity tool (B10)

BC3 “Continuity of Vegetation” validation

Use case: wildfire risk assessment based on ignition zones (150 m radius, 7 ha circle) in Lithuania

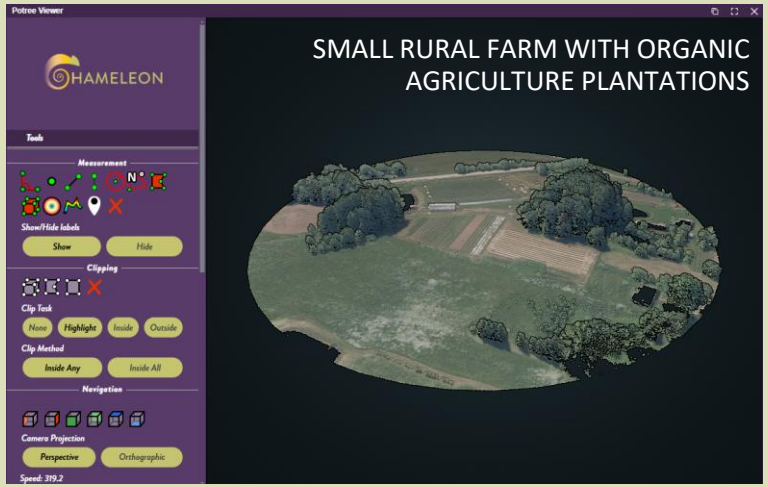


Wildfire risk: very high
Forest type: coniferous
Tree species: spruce
Forest age: 40-50 years
Canopy cover: 80%
Other features:

- Small rural farm (multiple buildings)
- Reforestation plantations
- Orchard
- Agriculture
- Livestock

Wildfire risk: high
Forest type: deciduous
Tree species: birch, grey alder
Forest age: 30-70 years
Canopy cover: 64%
Other features:

- Small rural farm (multiple buildings)
- Orchard
- Agriculture
- Poultry
- Pasture (grazing land)

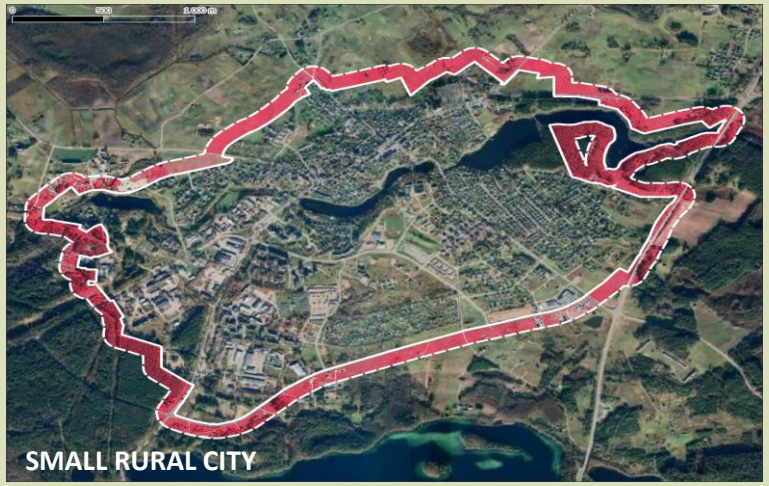


Wildfire risk: medium-low
Forest type: deciduous
Tree species: black alder
Forest age: 60-80 years
Canopy cover: 36%
Other features:

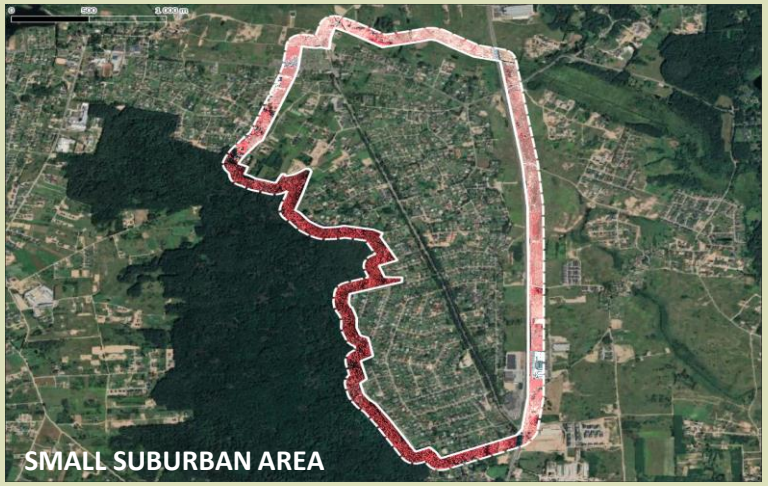
- Small rural farm (multiple buildings)
- Organic agriculture plantations (eco-certified)
- Pasture (grazing land)
- Natural grassland, meadows

BC4 "Characterization of Wildland-Urban Interface" validation

Use case: analysis of small WUIs in Lithuania



Wildfire risk: medium-low
Population: 6000
Area, sq. km: 4.96
Perimeter, km: 13.7
WUI, sq. km: 1.37
FUI: 23%
Tree species: coniferous
Other characteristics:
- Low population density area
- Medium-small forest interface
- Tourist resort

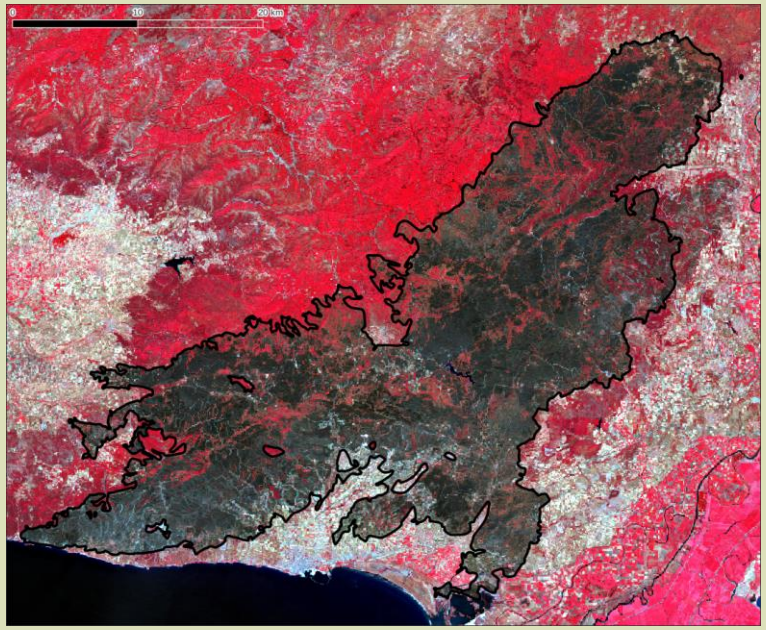


Wildfire risk: medium
Population: 2000
Area, sq. km: 4.1
Perimeter, km: 10.7
WUI, sq. km: 1.07
FUI: 43%
Tree species: coniferous
Other characteristics:
- Medium population density area & forest interface
- Nature reserve, sensitive ecosystems, protected area
- High transport transit, industrial areas

Wildfire risk: medium-high
Population: 100
Area, sq. km: 0.17
Perimeter, km: 2.7
UI area, sq. km: 0.14
FUI: 74%
Tree species: deciduous
Other characteristics:
- Medium population density area
- Very large forest interface
- High transport traffic

BC5 "Hot Spot Identification at the Beginning of Wildfire" validation

Use case: wildfire analysis in Greece



Location:	Alexandroupolis, Greece
Area, sq. km:	800+
Appx. date:	2023-08-23
Land use type:	forest
Vegetation:	very dense
Surroundings:	forest, mountains, urban areas
WUI:	yes, large

Location:	Nemea, Greece
Area, sq. km:	5+
Appx. date:	2024-07-11
Land use type:	forest, vineyards
Vegetation:	medium density
Surroundings:	forest, vineyards
WUI:	no/small

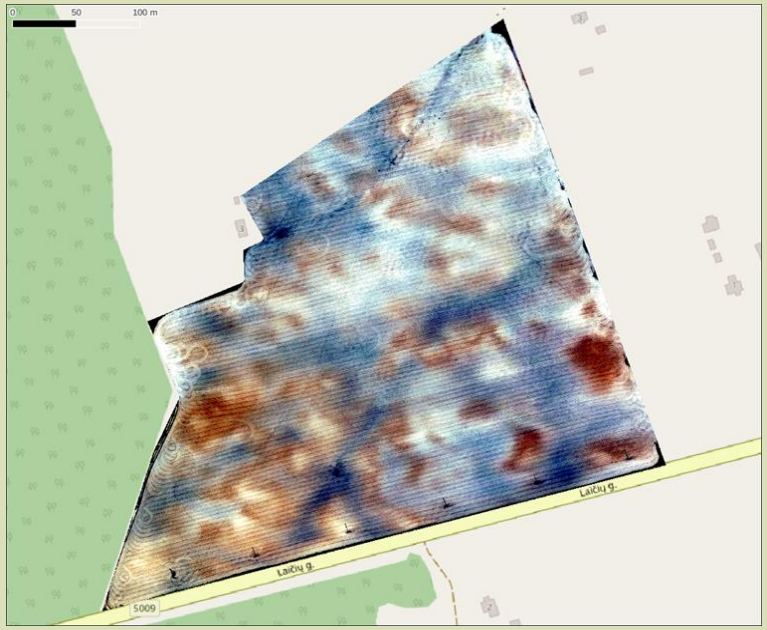
Location:	Kranidi, Greece
Area, sq. km:	2+
Appx. date:	2024-06-21
Land use type:	olive groves, orchards, forest
Vegetation:	low density
Surroundings:	olive groves, orchards, urban areas
WUI:	yes, large

BC10

“Soil Zoning Based on Bare Soil Reflectivity” validation

Use case: analysis of bare-soil fields for afforestation in Lithuania

Area, ha:	15
Productivity:	9-45
Moisture:	high
Redness:	high
Soil type:	mixed (sandy clay loam)
Soil variation:	very high
Optimal for:	coniferous or deciduous trees



Area, ha:	11
Productivity:	24-35
Moisture:	medium
Redness:	high
Soil type:	mixed (sandy clay)
Soil variation:	very high
Optimal for:	coniferous trees

Area, ha:	1
Productivity:	46-48
Moisture:	low
Redness:	medium
Soil type:	mixed (loam)
Soil variation:	medium
Optimal for:	deciduous trees

Validation process

Evaluation based on comparative analysis

Stage 1

- 1.1. Definition of use-case scenarios
- 1.2. Analysis of technical requirements
- 1.3. Data acquisition

Stage 2

- 2.1. Familiarization with the Tools
- 2.2. Testing and validation with data samples
- 2.3. Demonstration with all use-case scenarios

Stage 3

- 3.1. Comparative analysis, evaluation
- 3.2. Review of results, ideas for improvement
- 3.3. Promotion of project results, exploitation plan

FIRE-AID results

Milestones and KPIs

- **4** CHAMELEON tools validated
- **3** Validation sites per tool
- **12** Use-case scenarios demonstrated in total
- **2** EU countries of validation sites – Lithuania and Greece
- **4** CHAMELEON Deliverables prepared
- **84** Concrete comments and suggestions on tools' functionality shared
- **5** Channels used for publishing of dissemination materials
- **21** Social media posts and publications released in total

FIRE-AID video

Follow this link to watch the FIRE-AID video

CHAMELEON

Thank you for your attention!
Do you have any questions?

Dr. Indre Urbanaviciute

FIRE-AID Project Manager

AIDIA, MB

indre@aidia.lt

www.chameleon-heu.eu **@Chameleon_HEU** **@ChameleonHEU**

Funded by the European Union

Funded by the European Union. Views and opinions expressed are however those of the author(s) only and do not necessarily reflect those of the European Union or the European Research Executive Agency. Neither the European Union nor the European Research Executive Agency can be held responsible for them.