Integrated fire protection system

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Meleagros

- An integrated fire protection system
  - Video smoke and flame detection
  - Admin application for crisis management
  - Fire simulation engine

- Suitable for many application domains
  - Forests and natural heritage, Plants and Industrial Facilities, Warehouses, Malls, Monuments, Vacation homes, …

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Why video fire detection?

- Open or large space fire monitoring is not efficient and cost-effective with other means:
    - Satellite, sensors, …
- Allows for visual verification of events
- Can work with commodity hardware
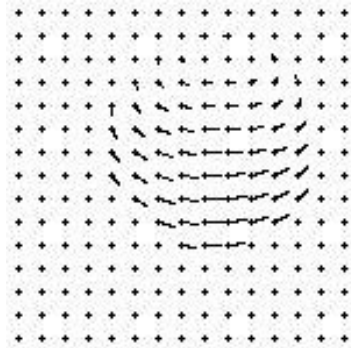- Other events can be simultaneously detected

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Video fire detection

- **Basic detection methods**
  - Motion detection
  - Color detection
  - Geometry detection

Video motion detection

- **Three basic techniques**
  - Background subtraction
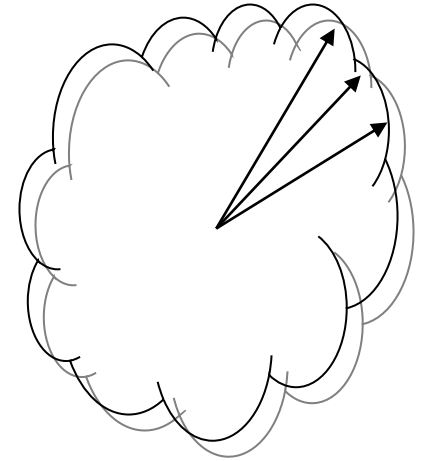 - Difference of two successive frames
  - Optical flow

- **Can be common for flames and smokes**

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Video color detection

- Based on color characteristics of flame or smoke

- Both RGB and YUV colorspaces can be used

- Flame and smoke colors may vary

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Advanced detection methods

- Geometry characteristics
  - Smoke: turbulence characteristics

- Space and time variability of fire or smoke pixels
- Motion orientation
  - Smoke moves usually upwards
- Flame flickering

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Original frame

Motion mask

Motion mask processed

Color mask

Color mask processed

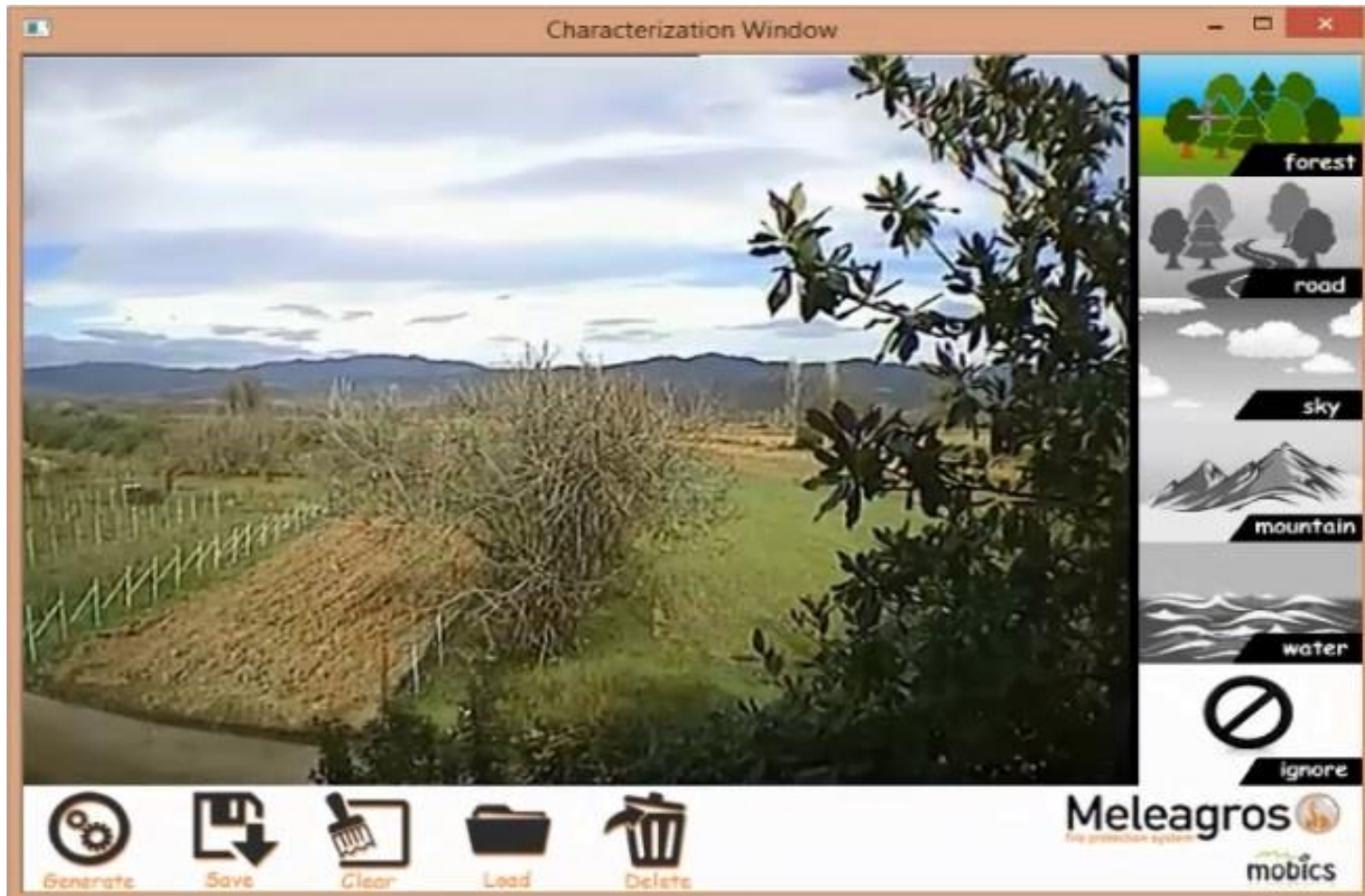# Combination + other advanced detection algorithms

Alarm

Scene characterization

- Characterization of the scene (region of interest, ROI) regarding fuel types

- Speeds up the detection process while considerably reducing the false alarm rate

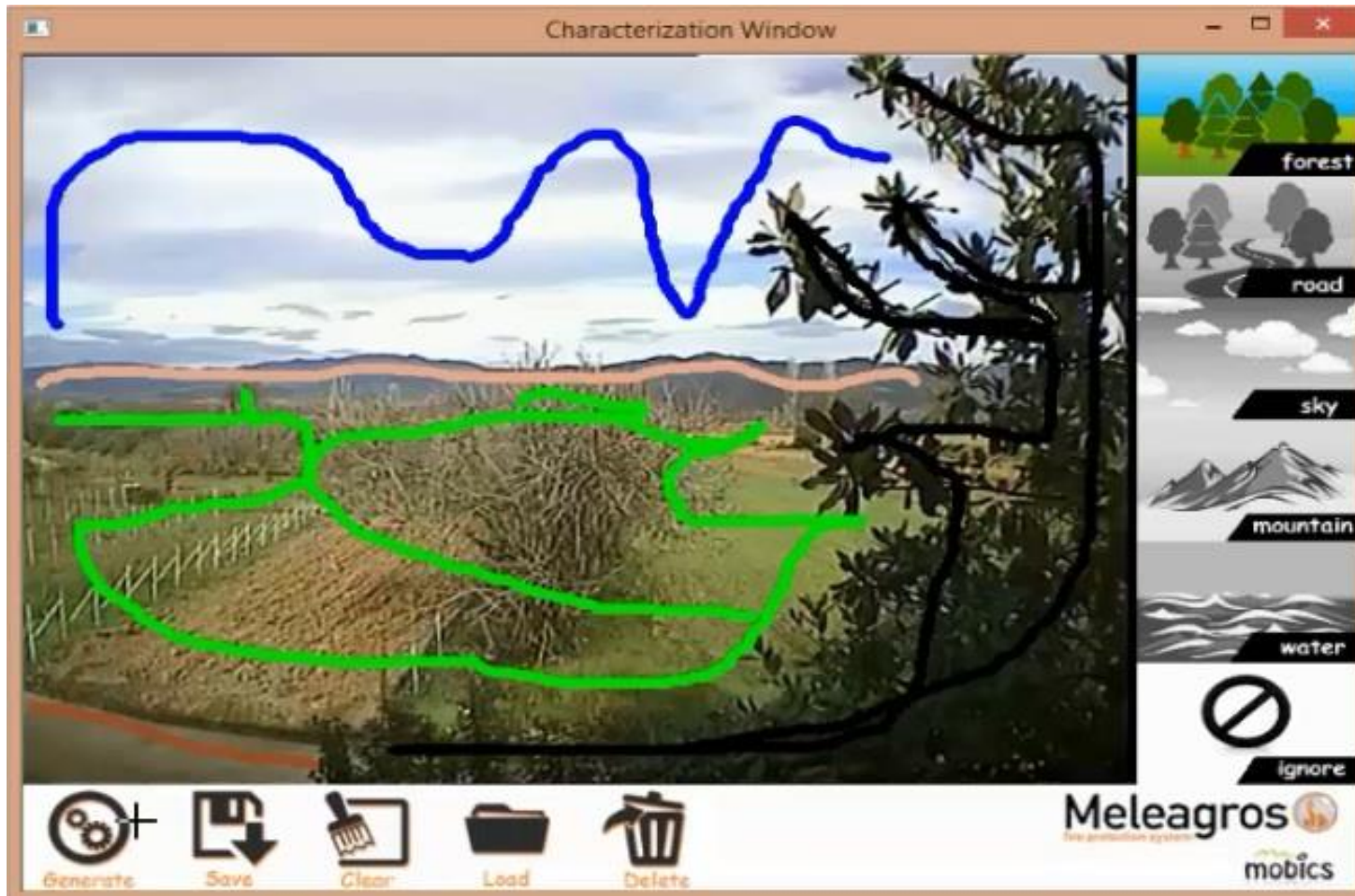- Easy to use tool with predefined scene types (e.g. forest, sky, etc.) for image segmentation
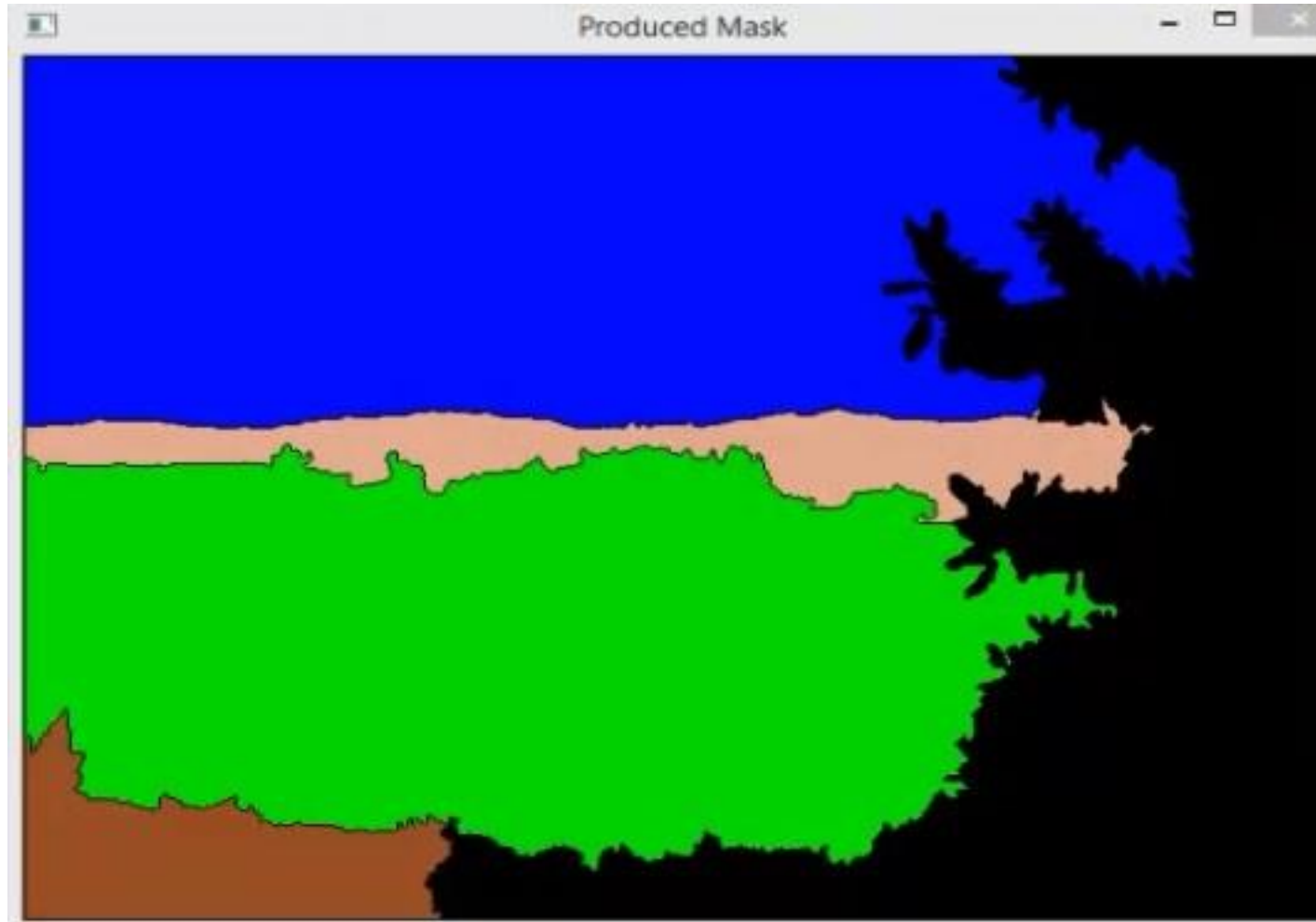
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Scene Characterization Tool

Characterized Area

Algorithm Output

Produced Mask

Control and Management

- Alerts and incidents
- Visual verification
- Equipment tracker
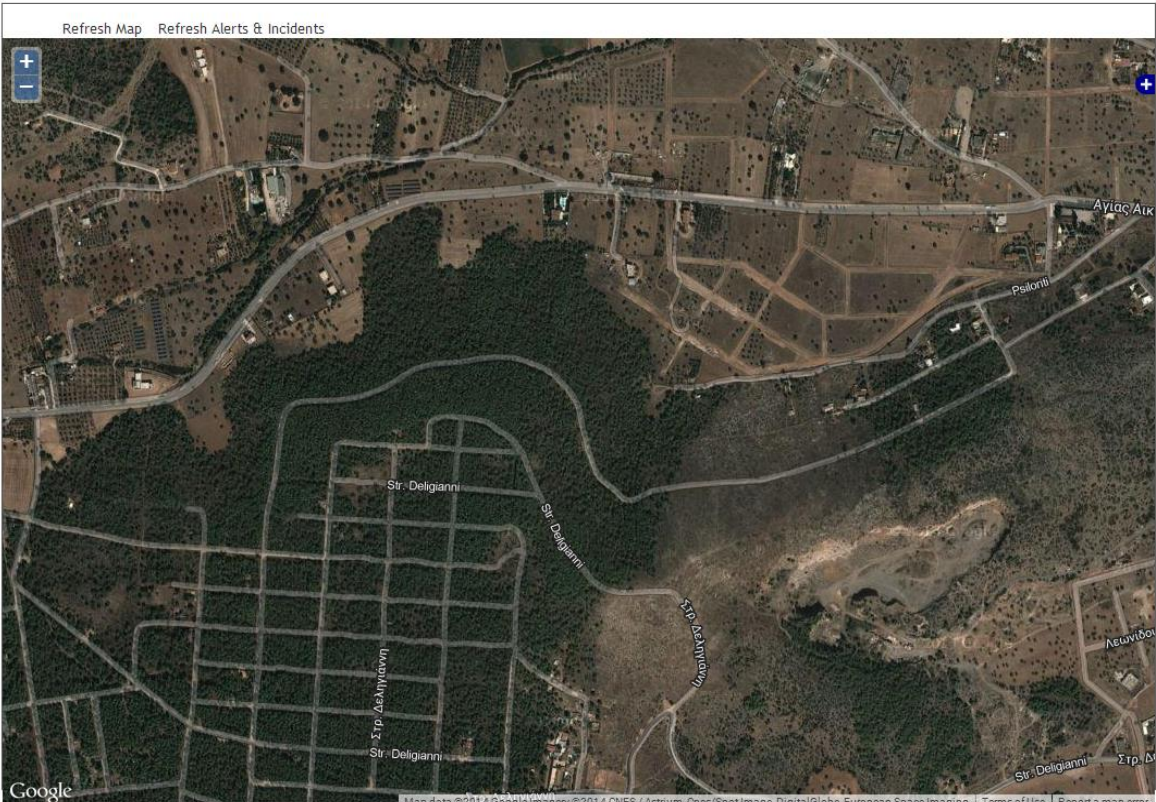- Historical data
- Simulation engine

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Control and Management

Fire Simulator

- Fire simulation tools
  - FARSITE
- Maps
  - Google maps, OpenStreetMap
- GIS
  - GRASS, Mapserver

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Fire Simulator

Thank you!

More information on: www.meleagros.eu

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