

# UAV BASED SMART DETECTION & LOCALIZATION OF RADIOACTIVE AREAS

Real-time Situation Awareness  
for First Responders

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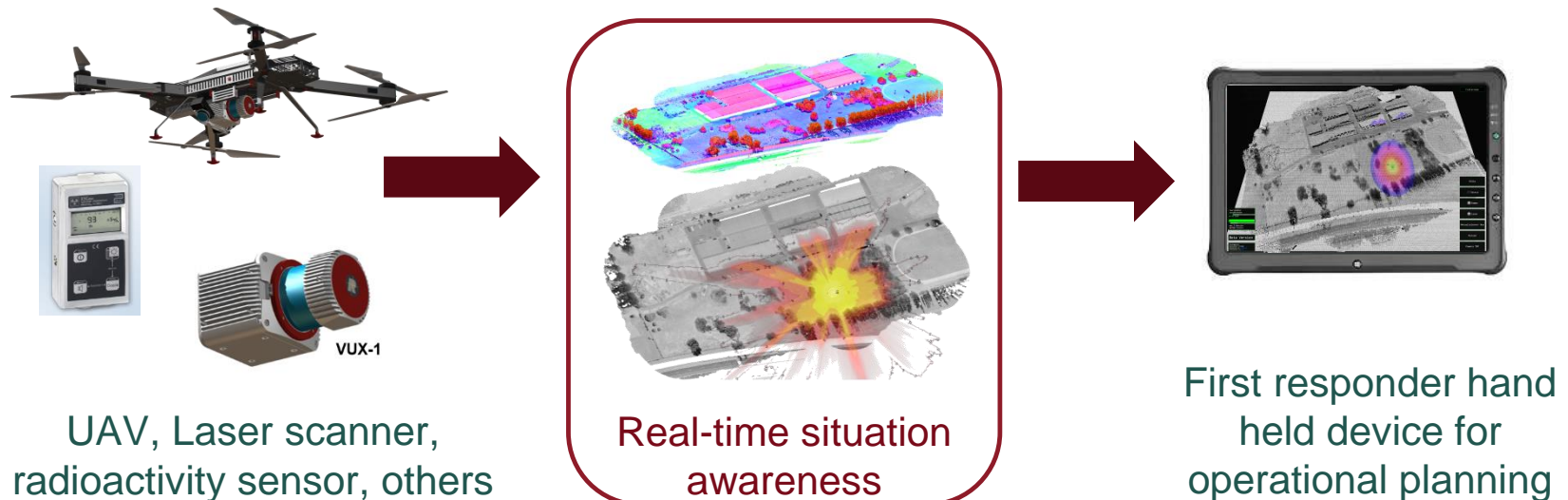
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# OBJECTIVES AND VISION

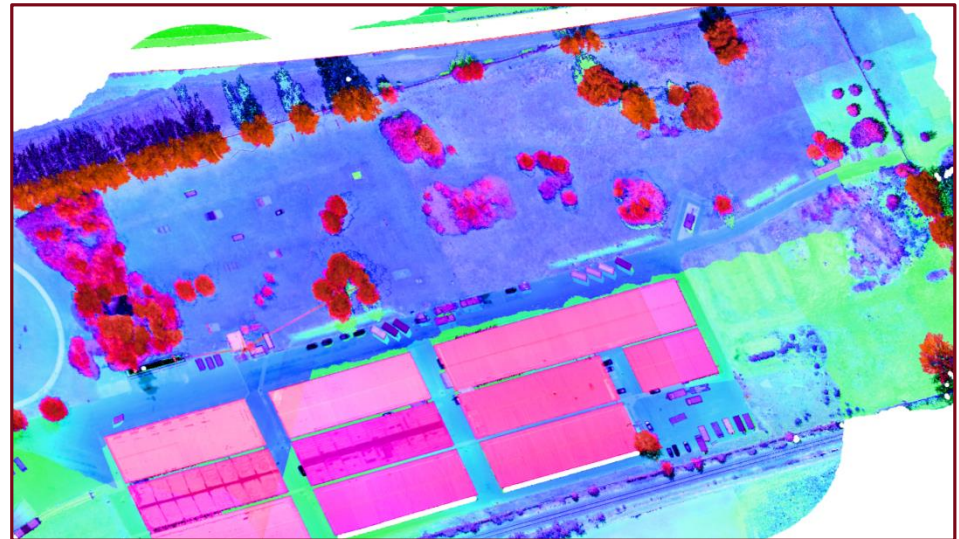
Improving **decision support** for operational planning by providing **real-time situation awareness**

- **accurate 3D terrain** maps of the current situation
- **automatic detection and localization of radioactive sources**
- **contamination maps** to show potential hazardous zones
- **immediate visualization** of results on a hand held device  
→ **increased personal safety**



# EXPLORATION OF UNCHARTED ENVIRONMENTS

- **Accurate 3D Terrain maps**
  - **live data streaming** to ground station while UAV flies across area
  - 3D Terrain map is **updated in real-time** based on laser measurements
  
- **Dynamically improving ground model**
  - New laser points always contribute to 3D terrain model
  
- **See through vegetation**
  - revealing hidden pathways
  - impassable streets
  - terrain irregularities

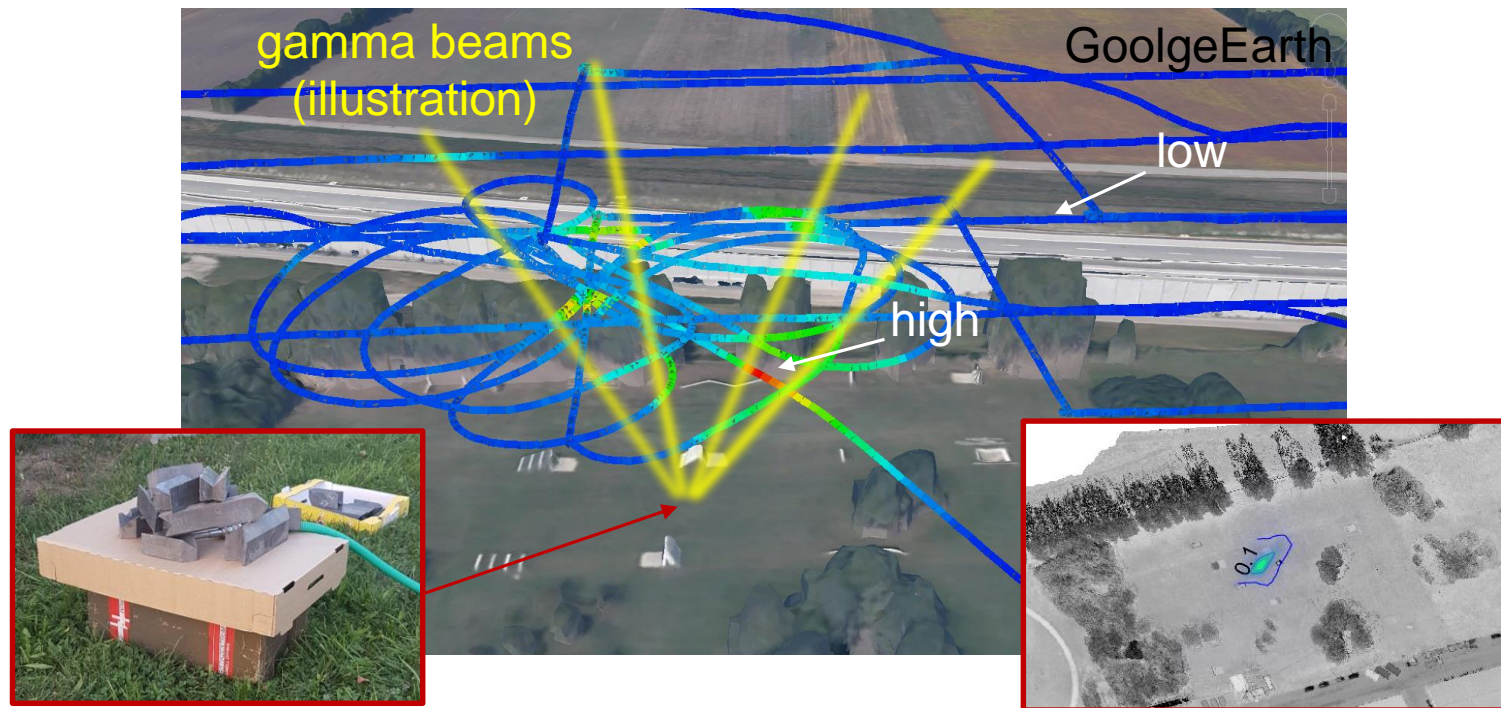


3D Terrain map including vegetation

# SMART DETECTION OF RADIOACTIVE SOURCE

Generate a consistent view of 3D LiDAR and CBRNE sensors by

- **fusion** of all available measurements (LiDAR, radioactivity) into a
- **comprehensive information** set aiming to reveal position and parameters of radioactive sources

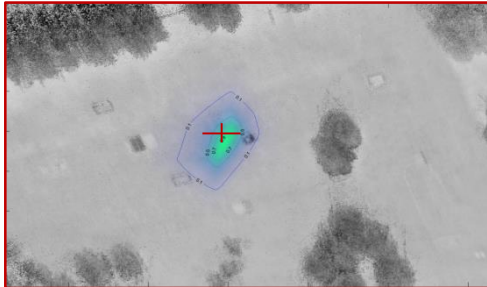


radioactive source partially obstructed

localized source

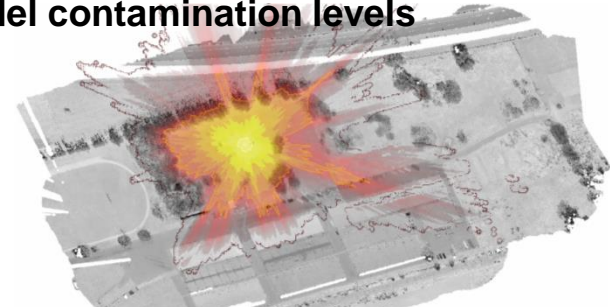
# BENEFITS OF REAL-TIME SITUATION AWARENESS

Localization of a single radioactive source within a minute



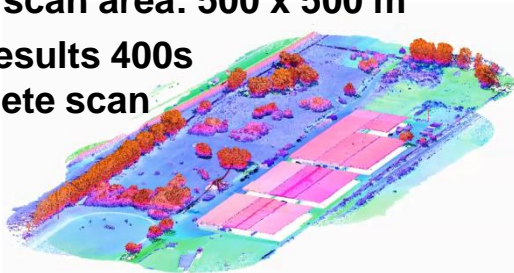
Radioactive source detection

Radioactivity measurements are combined with 3D terrain maps to model contamination levels



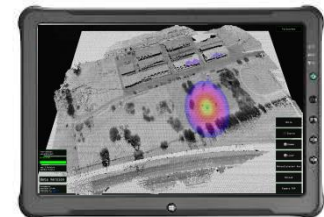
Contamination above ground

- High quality  
20k laser pts/s → 30 pts/m<sup>2</sup>
- Large scan area: 500 x 500 m
- Fast results 400s complete scan



Reliable ground models

- Complex situations (fragmentation)
- Accuracy of localization ~ 1m
- Real-time situation awareness



Smart detection & Visualization

## PARTNER OVERVIEW – IPR MAP



- Copter + Laser scanner
- Gamma detector
- System Engineering, data analytics, data fusion, data processing, radiation source localization
- Mobile visualization
- Usability analysis
- Wireless communication optimization



**CBRN Protection**



# CONTACT

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