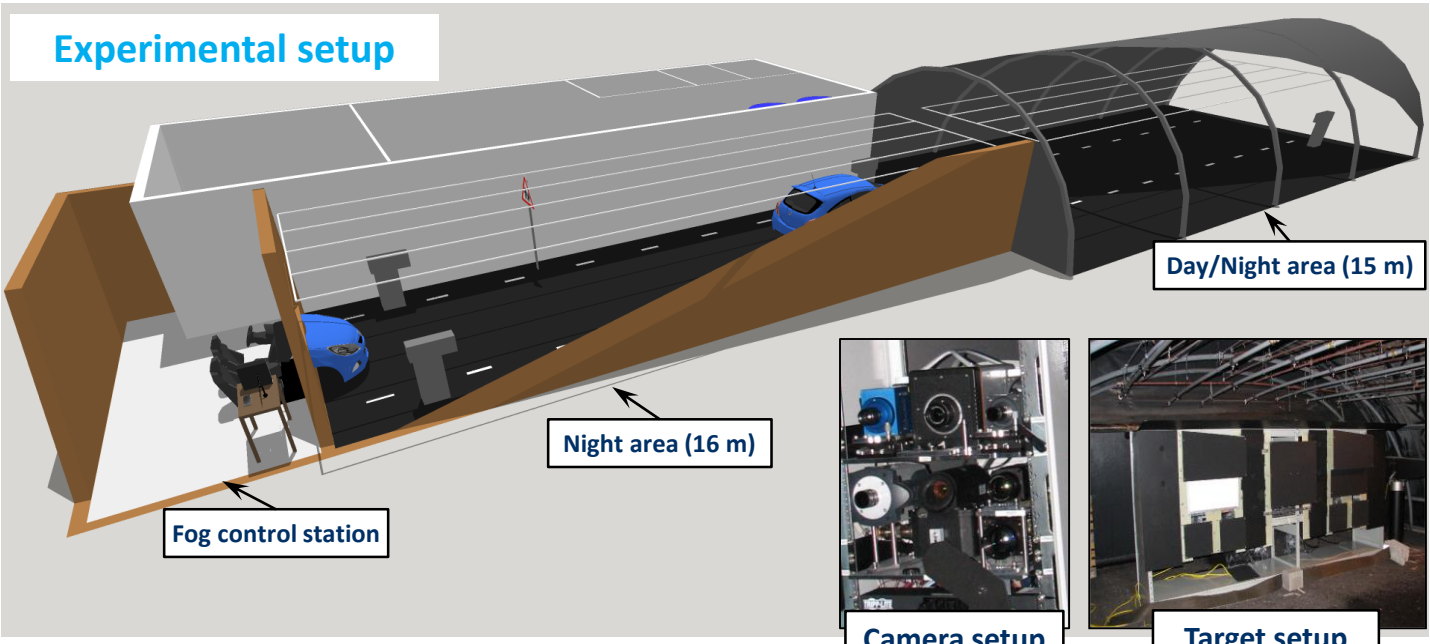
Direction territoriale Centre-Est

# MULTISPECTRAL FOG DATABASE

## ADVERSE CONDITION IMAGERY

**INO offers a multi-spectral fog imagery database with annotations for the design of outdoor operating camera systems, as a prediction tool for their performances in adverse weather conditions. The database was acquired in CEREMA fog chamber, using multiple cameras and multiple target types, in different fog conditions.**

### Experimental setup




### Features

- Multispectral sensor synergy (passive visible, SWIR, MWIR & LWIR cameras)
- Multispectral target setup:
  - Point sources (incandescent and LED spots) & visible extended sources (LED)
  - Contrast targets (visible and IR)
  - Thermal extended sources
- Artificial fog provided by CEREMA Fog Tunnel along with temperature, visibility and size distribution measurements (small & large droplets, day and night time conditions, fog produced on determined visibility levels or in natural dissipation mode)
- Human visual observations

### Applications

- Outdoor imaging
- Transportation
- Aeronautics
- Fog models validation
- Sensor performance assessment

**R&D CONTRACTS – PROTOTYPING – PREPRODUCTION**
**SHORT-RUN PRODUCTION – TECHNOLOGY TRANSFER**

Cerema
Direction territoriale Centre-Est

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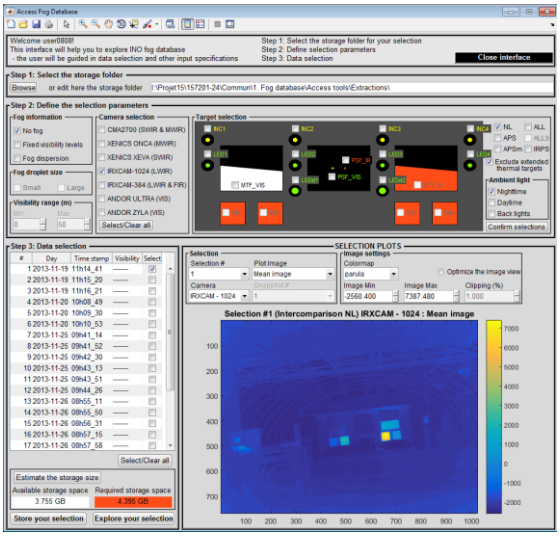


## Features

- MATLAB GUI to select, visualize and extract data
- Selection possibilities:
  - Target/camera configuration
  - Fog parameters (size, visibility)
  - Fog production (fixed visibility level or dissipation)
  - Day and night time conditions

## Advantages

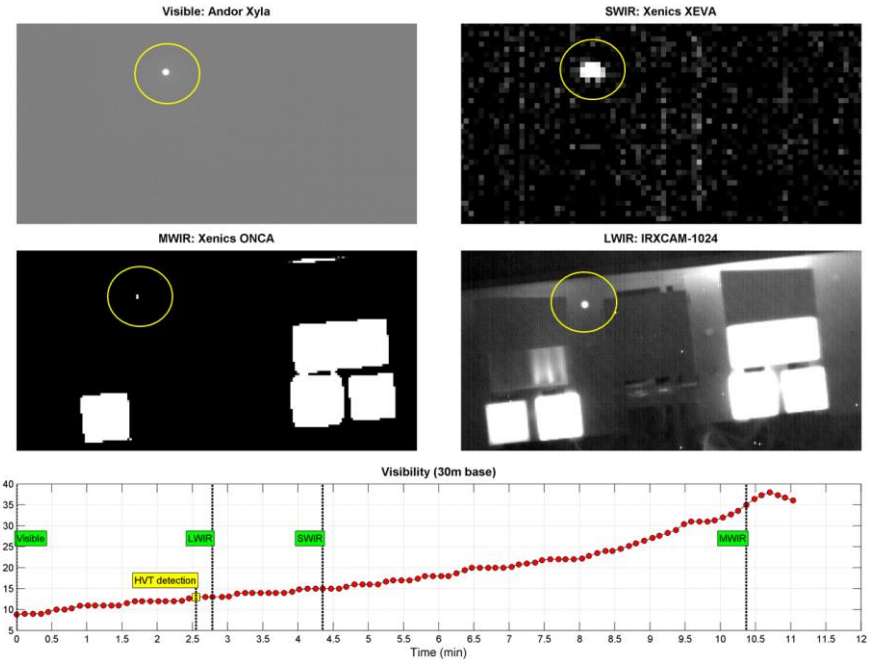
- Easy database access through GUI
- Use of available fog data to interpolate or extrapolate user conditions

## Application: Multispectral target detection

- Passive visible, SWIR, MWIR & LWIR camera responses compared to Human visual threshold detection
- Target: incandescent spot
- Fog condition: artificial fog (small droplets) in dissipation mode (visibility decreases from 10 to 40 m)

**Results**:

- The target is detected from the start by the high resolution visible camera, followed by LWIR camera
- Human detection time is close to LWIR camera one




INO is a world-class center of expertise in industrial applications for optics and photonics, and a leading developer and provider of video analytics and multispectral imaging solutions

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