FFI Norwegian Defence Research Establishment

Situational awareness for autonomous systems

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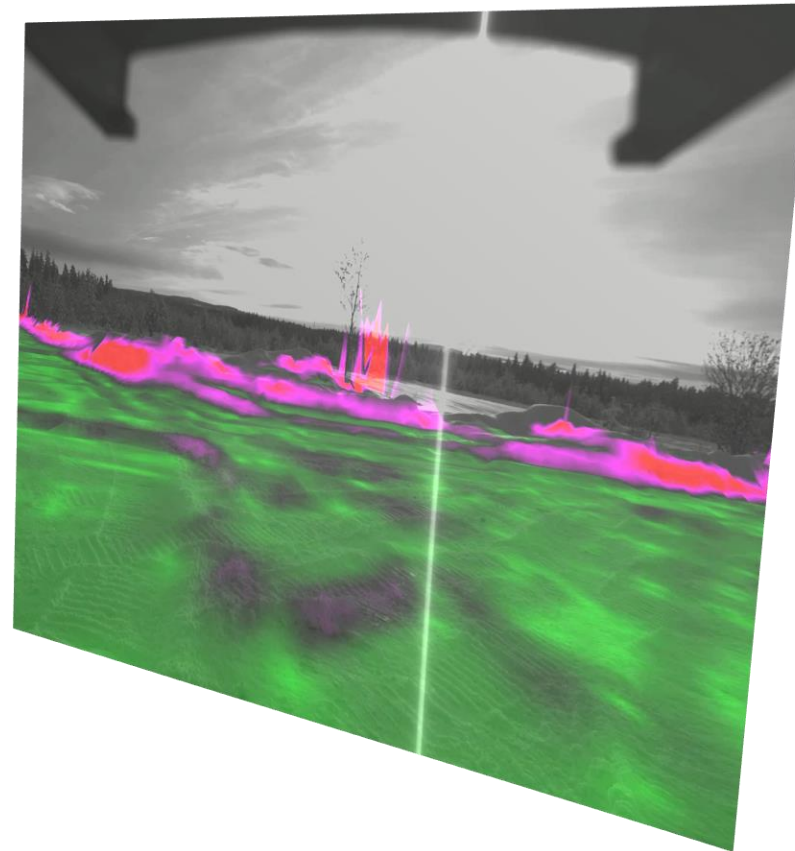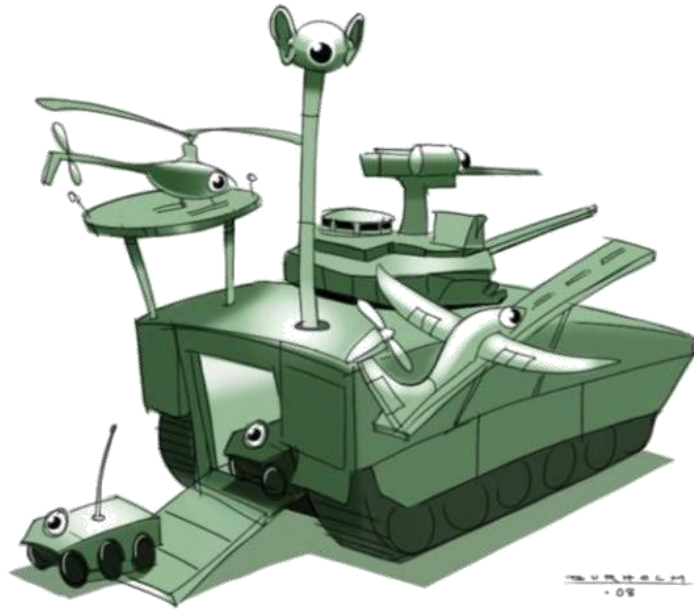
Foto: AdobeStock

How can a machine become aware of its surroundings?

«Perception»

«Spatial perception»

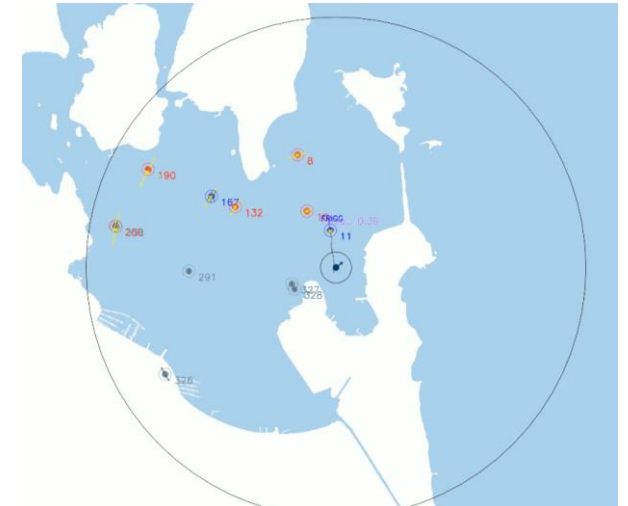«Spatial AI»

At FFI we work with many autonomous systems

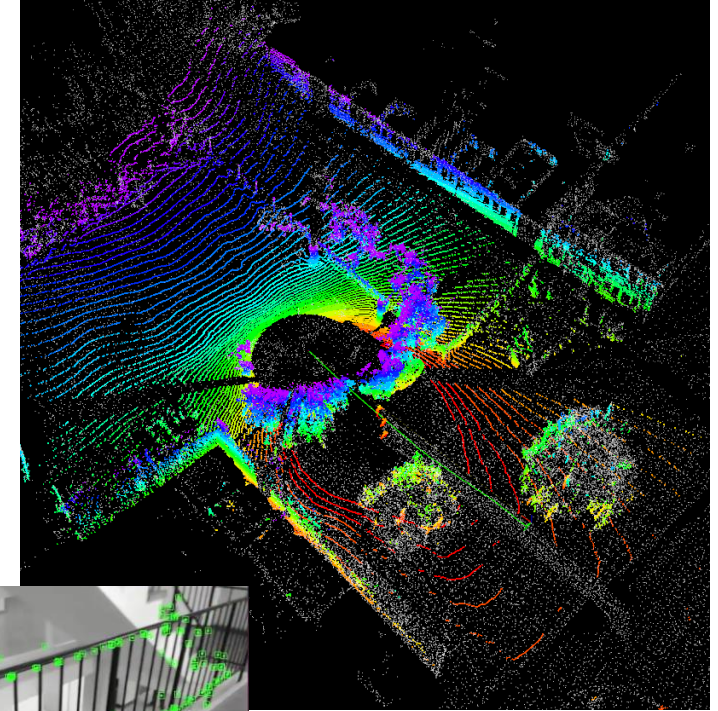# … and use many different types of sensors

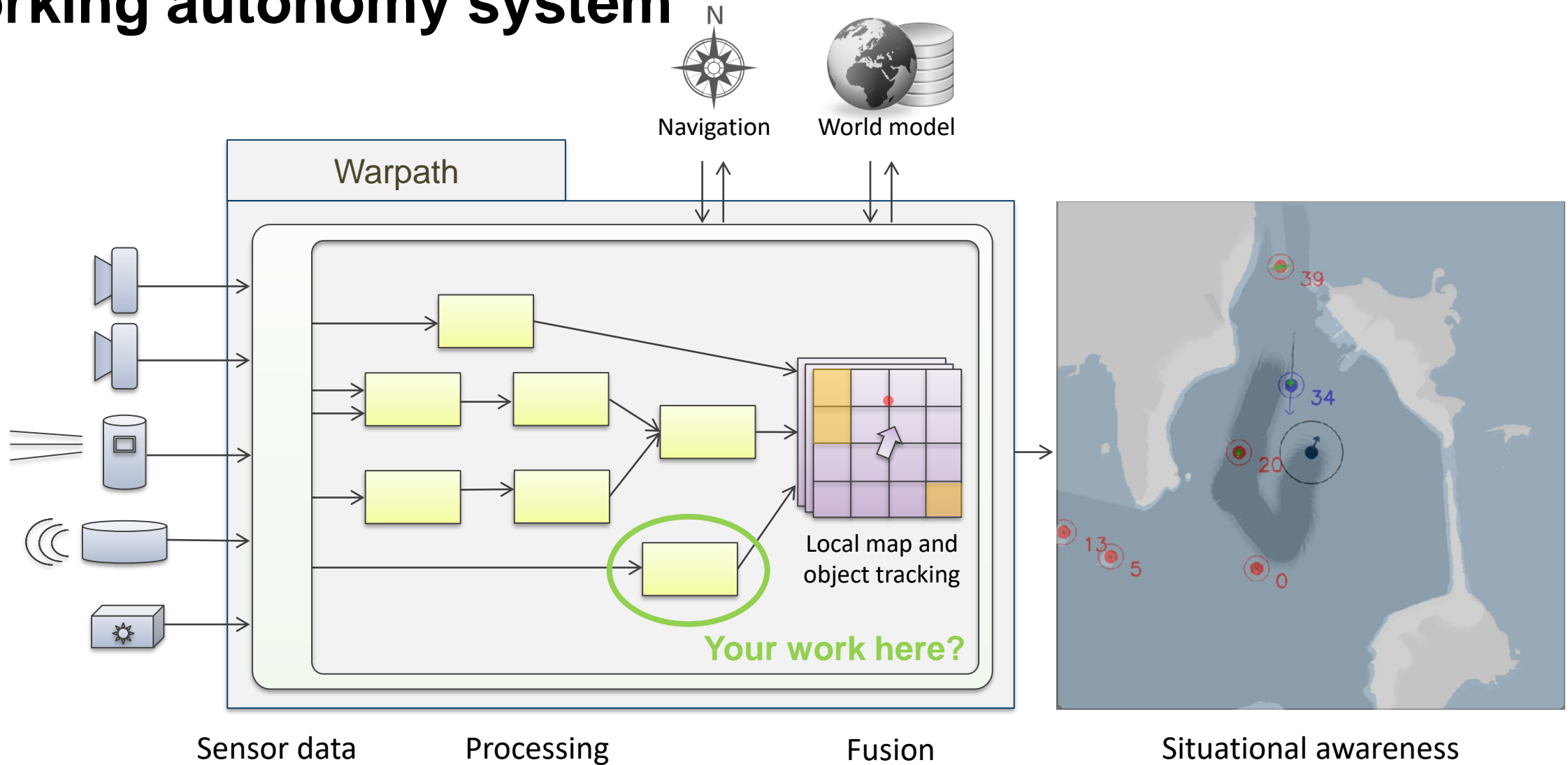# We extract measurements from sensor data

… and we fuse across time, sensors and platforms

Estimating motion from the sensors improves precision

Contribute as part of a larger, working autonomy system

Navigation

World model

Warpath

Local map and object tracking

Your work here?

Sensor data

Processing

Fusion

Situational awareness

Potential topics for UGV applications

- Multi-camera stereo systems and self-calibration

- Lidar- and camera based SLAM

- Terrain/road segmentation and object identification

- Terrain and obstacle mapping

- Situational awareness across vehicles

Potential topics for USV

- Object detection in radar, lidar and camera data

- Land/sea segmentation

- End-to-end deep learning for USV
  - Learn to avoid dynamic obstacles
  - Learn to co-operate
  - Learn to perform fine maneuvers

Potential topics for AUV

- Object detection and classification in sonar imagery

- Multimodal processing

- Change detection

- Generation and use of simulated data (GAN, DDPM)
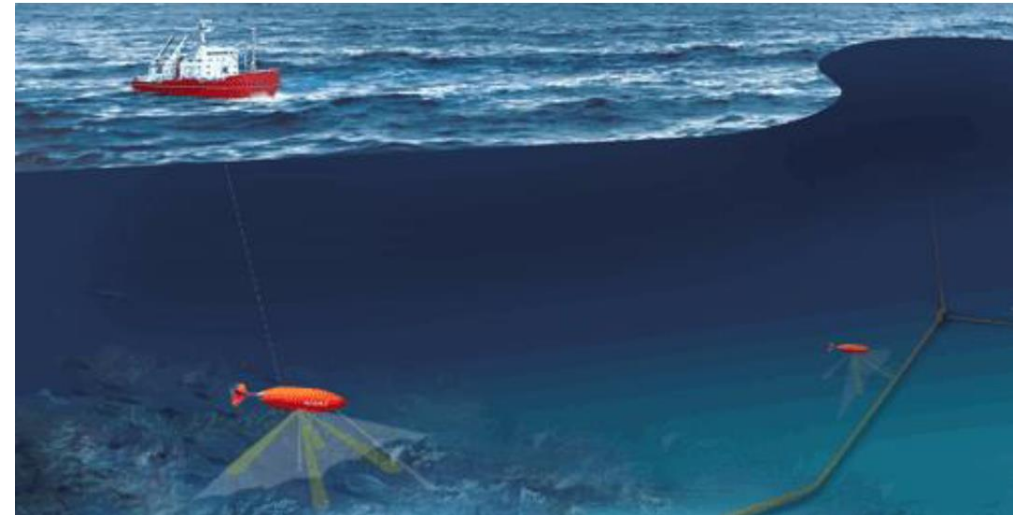
Potential topics for UAV applications

- Across-drone tracking

- Autonomous landing

- Terrain mapping

Spectral imaging from ordinary cameras!

Spectral imaging from ordinary cameras!

Does any of this sound interesting?

➢ Then let's have a talk!

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