



teknova



Kristiansand: Slottsquartalet

Grimstad: Mechatronics Innovation Lab

# Next generation ICT and Machine Intelligence Enabling Safe and Secure Societies

Nadia Noori

19.Mar. 2018

# 1. Part I:

## Introduction to Teknova and its Infrastructure

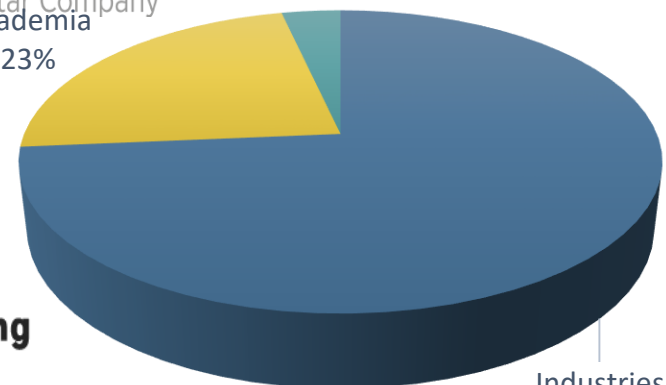
## Teknova AS

- Private non-for-profit R&D organization located in southern Norway since 2008.
- Interdisciplinary research group catering to a wide spectrum of industry related issues in security & safety, environment, energy and e-health applications.
- Transformation of leading edge ICT technologies and outstanding research ideas to industrial prototypes within key markets.
- Diversified group of owners and customers in different sectors ( energy, transportation, manufacturing and security)



Owners  
3%

agder energi



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Teknova merging into The Norwegian Research Center (NORCE) from ~ 01.01.2019 (900 employees)

Research merger with  
a national strength



Roger Normann (AF), Arvid Nøttvedt (CMR), Aina Berg (Uni Research), Kristin Flornes (IRIS)  
og Thor Arne Håverstad (Teknova). Foto: Arne Roger Janse, GCE Node



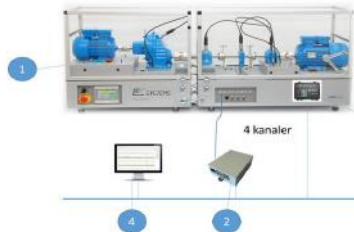


# New infrastructure in Southern Norway

**MIL** Mechatronics Innovation Lab



Vision System  
FH series



# Testing facilities in the South of Norway

**MIL** Mechatronics  
Innovation Lab



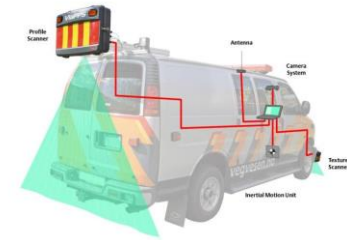
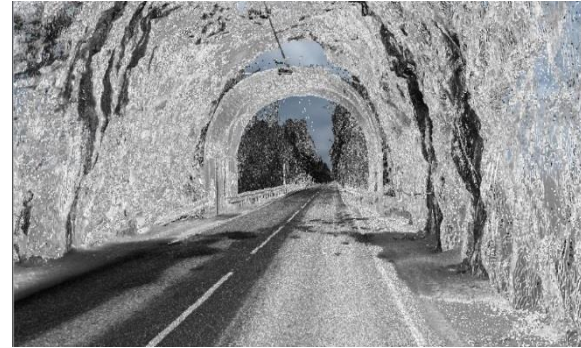
## 2. Part II:

# Selected Activity Areas on ICT for Digital Safety and Security



# Digitization of transport infrastructure for safer roads

A smart camera digitalizing tunnels / roads and automated monitoring and inspection by detecting safety risks in transport infrastructure and timely planning of maintenance



*Credit ViaTech*



More than 50 cars equipped for the road authority usage in the whole Norway

# Traffic monitoring for road safety and traffic management

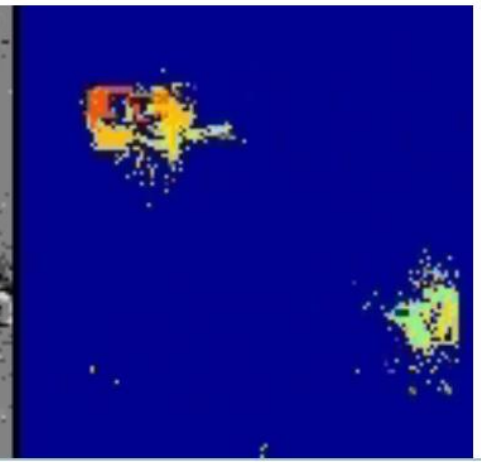
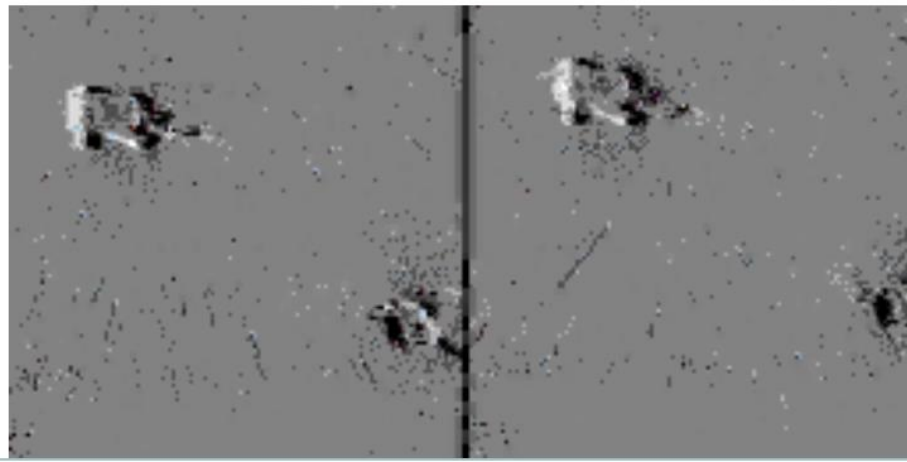
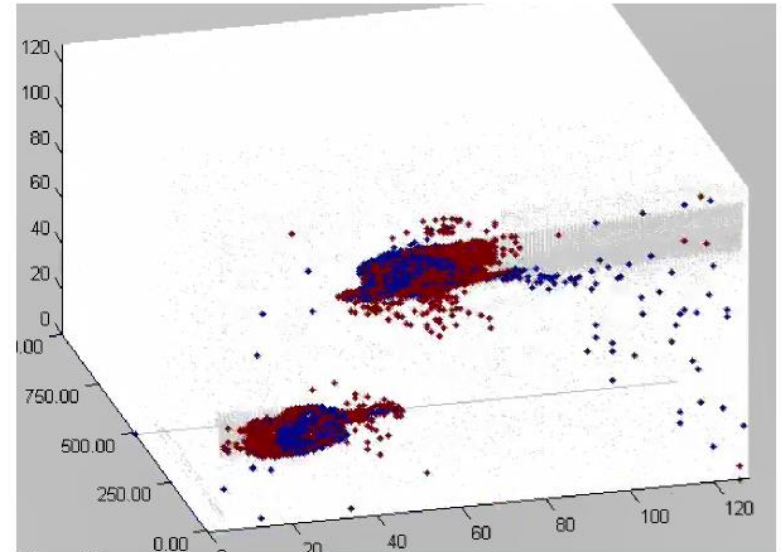


**Vehicle counting,  
speed  
measurement and  
classification**

# Non-motorized traffic monitoring for safer urban spaces

**Automated classification of pedestrians  
& cyclists**

→ Future smart cities





# Digital surveillance for safe and secure public spaces



**Person detection  
(indoor, outdoor)**

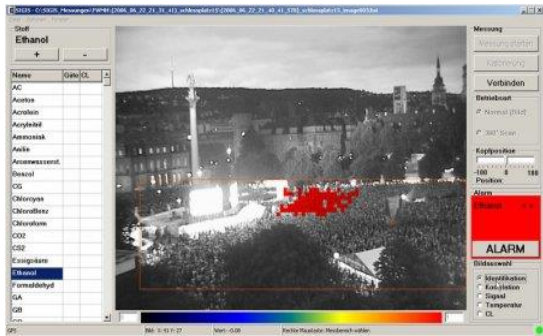


**Person flow & density**



# Digital monitoring @mass gatherings for safe urban spaces

Combining long range gas sensors and 360° 3D Vision for threats detection

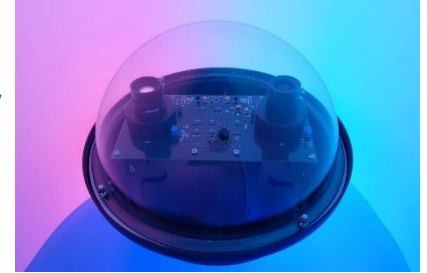




# Digital monitoring for secure and safe public events



- Digital people counting
  - Security and critical infrastructures safety
  - Reducing risk at high people flow
- Better crowd management

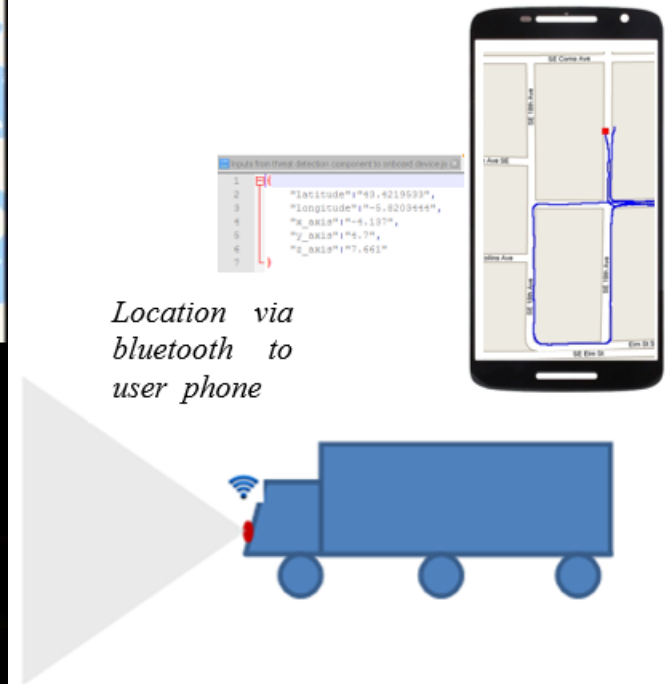
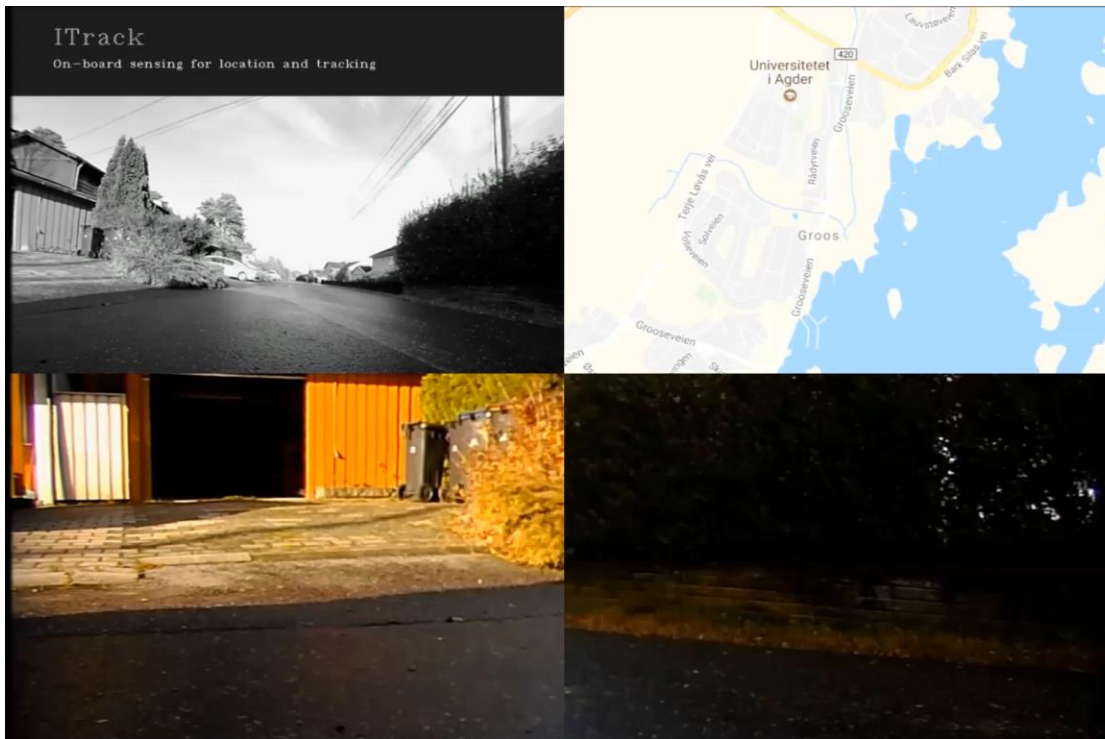


Dynamic stereo vision



# Smart tracking for safe navigation and fleet management

Real-time location & tracking of convoys including visual awareness of surroundings

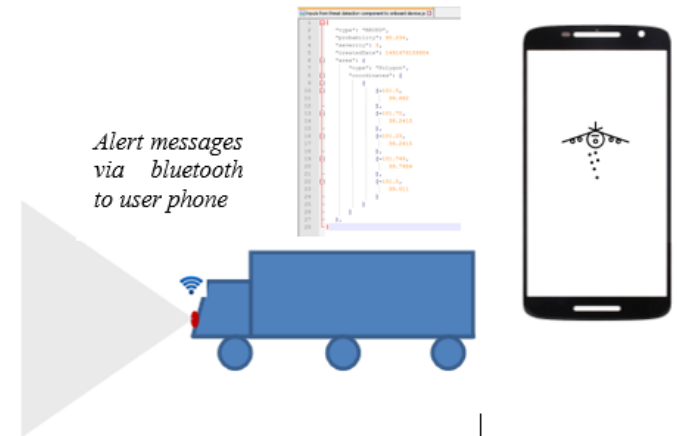
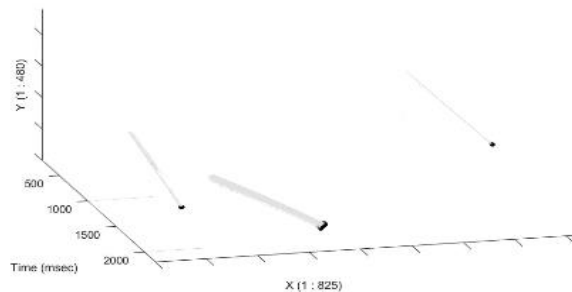


## Smart monitoring and threat detection for safe navigation and fleet management

Real-time situation awareness, detection and alerting of potential threats for protection of convoys.



iTrack  
On-board Threat Detection  
3D Spatiotemporal Analysis





# Digital environment registration for safe containerization and freight transport

3D Vision for automated corner casting and easy manipulation of containers





# Condition-based maintenance for safe offshore operations

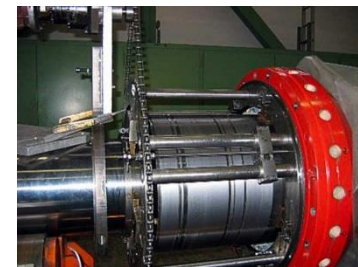
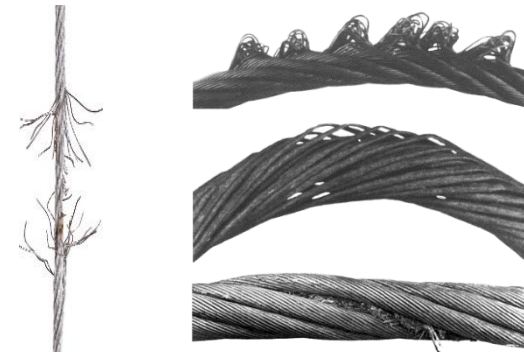
## Research-based Innovation Offshore Mechatronics (SFI)

Next generation of advanced offshore systems with a focus on automated operation and condition monitoring of topside drilling systems towards condition-based maintenance.



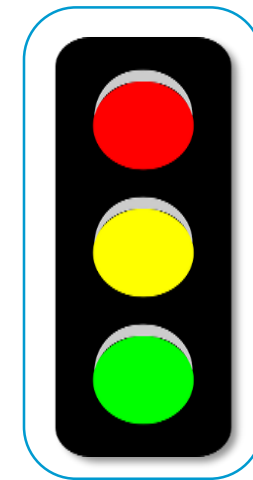
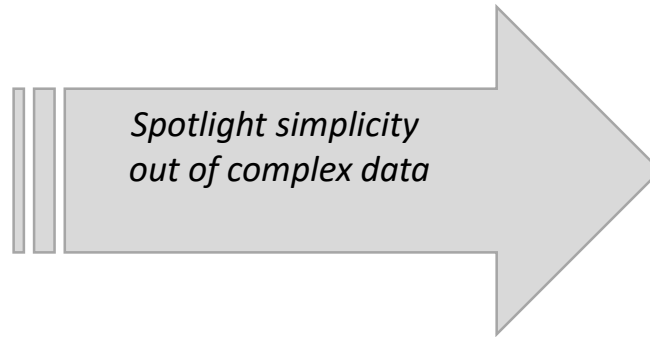
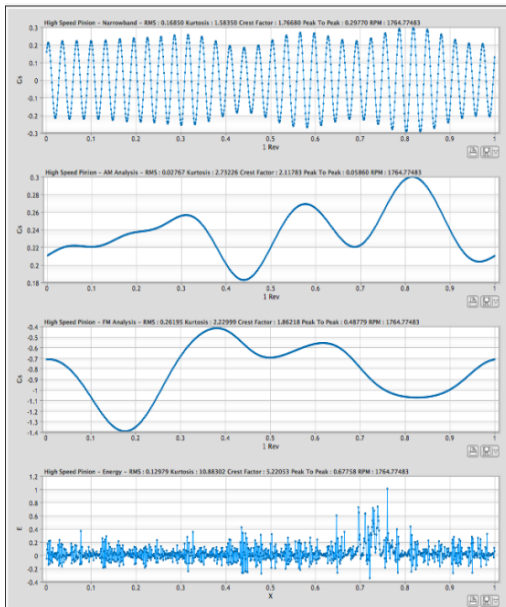
## Condition monitoring of ropes and bearings

Condition based maintenance of equipment by on-board monitoring analysis and prevention of faults and failure





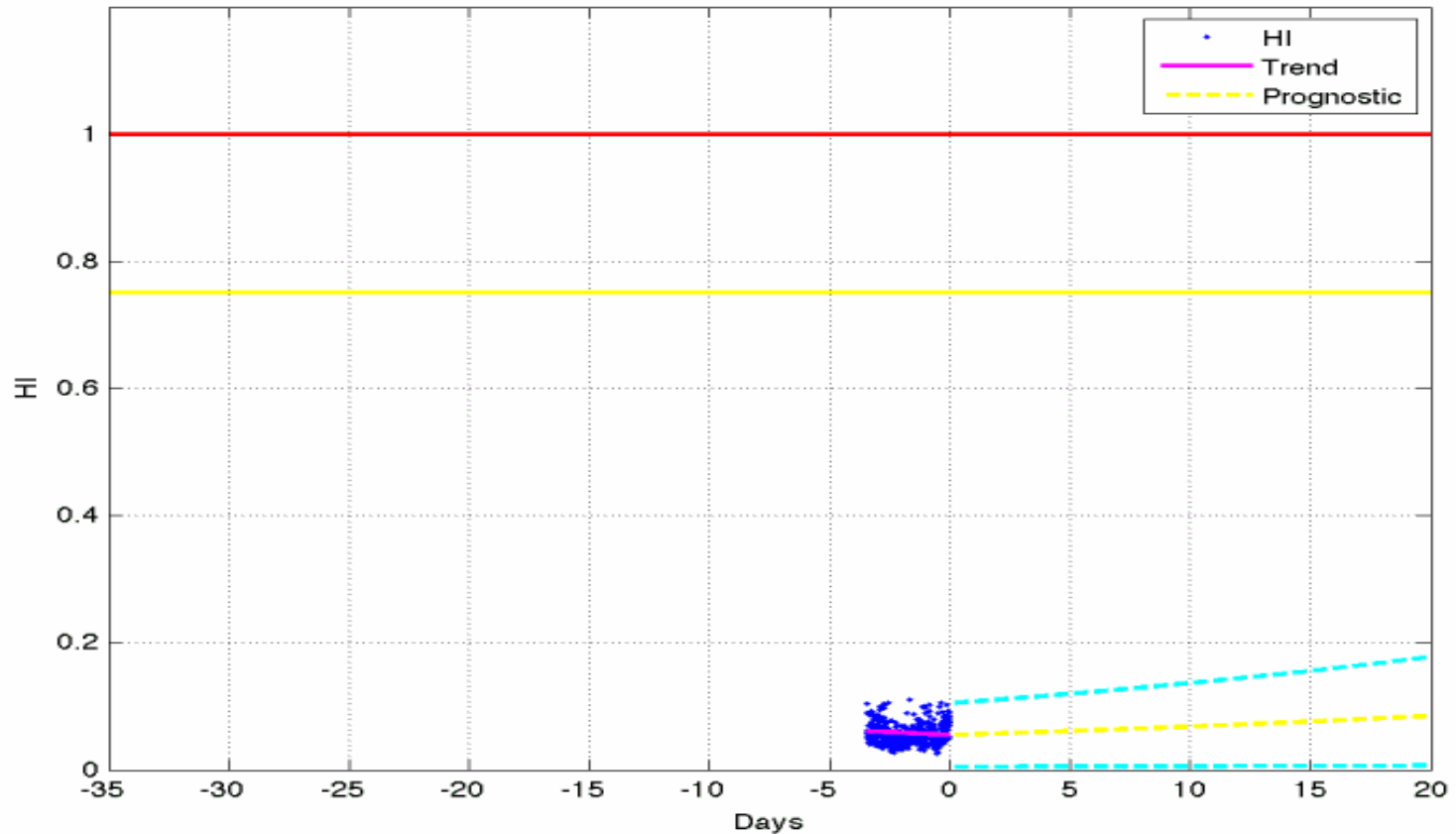
# Digital monitoring for critical infrastructure safety and downtime prevention



Creating stoplight simplicity out of complex and large data sets in real-time.

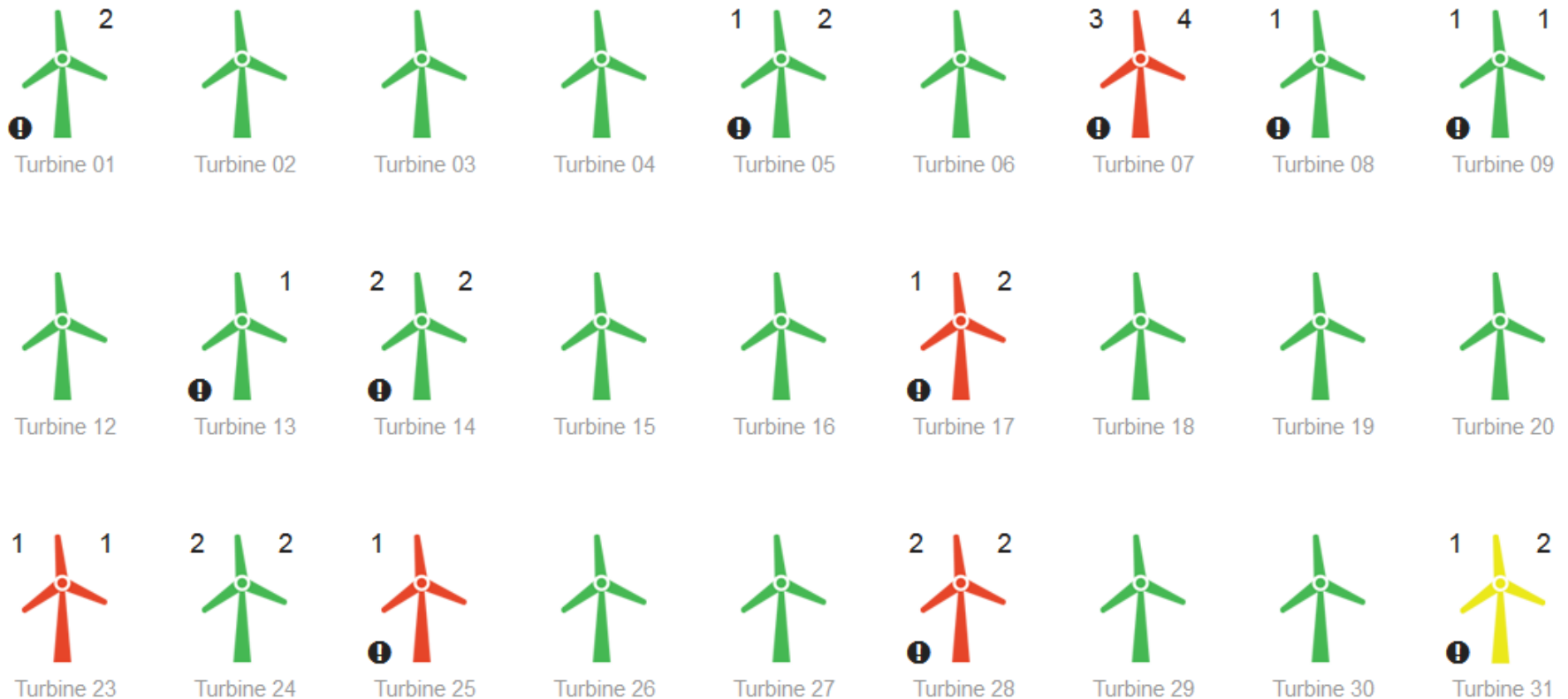


# Big data for critical infrastructure safety



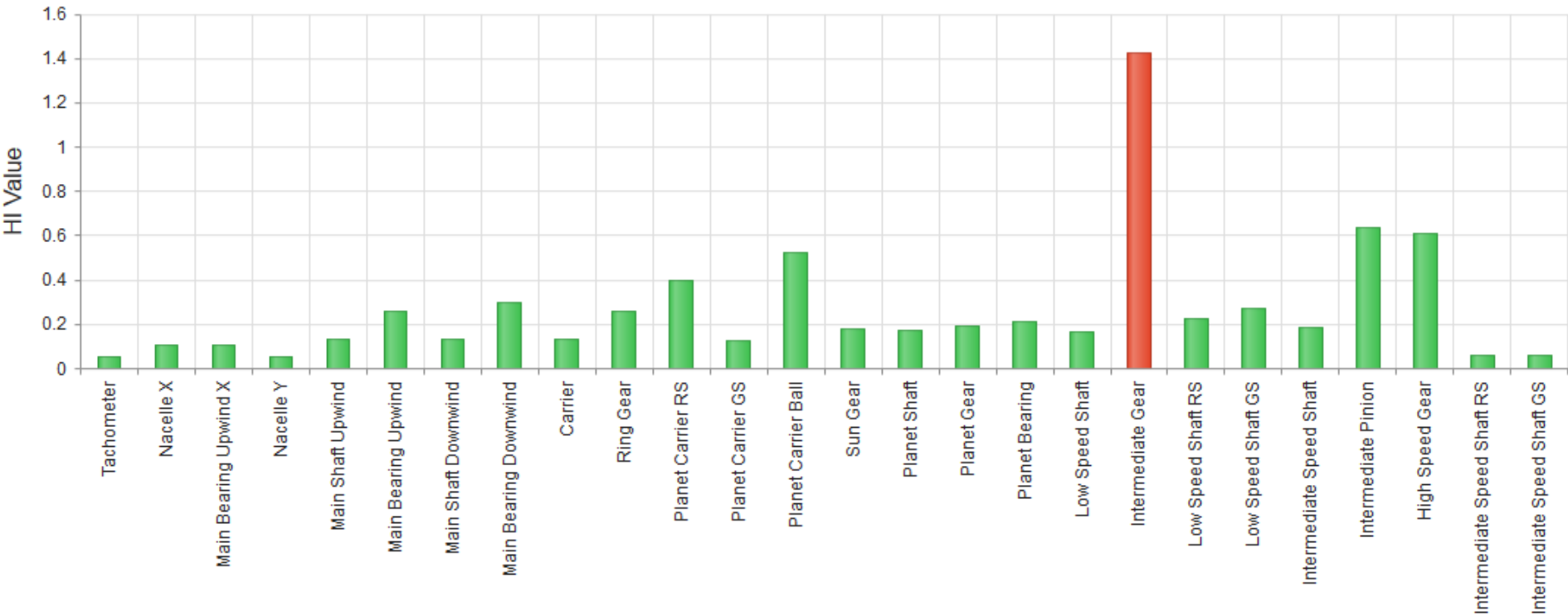
We compute the time to maintenance.

# Critical infrastructure monitoring: actual user experience



Monitoring more than 1000 win-turbine in real time! Collaboration partner GPMS in USA

# Critical infrastructure monitoring: fault identification



Actual data from a wind turbine in operation

# Digital monitoring for critical infrastructure safety and maintenance

## Condition monitoring of power poles

Smart cameras and drones for emote detection of rotten power poles and planning of their maintenance.



**Actual:**  
manual inspection  
of more than 180000  
poles in Agder

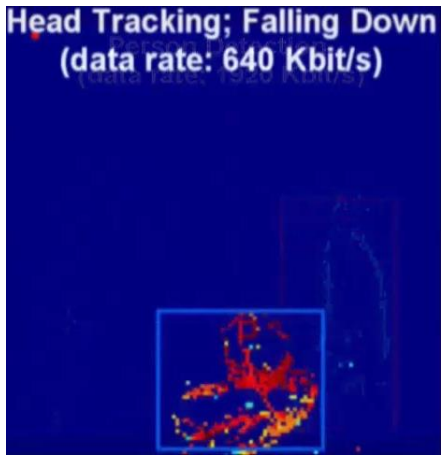


**Target:**  
Remote inspection by  
smart sensors on-  
board UAS



# Digital monitoring for independent living safety

Automated fall detection → Elderly independent living



Principle of operation



Euronews documentary showing the trials at the elderly home in Germany



## Contact Information

**Teknova AS** is located in Kristiansand and Grimstad in southern Norway.

Telephone: +47 40 10 81 37

Email: [nabil.belbachir@teknova.no](mailto:nabil.belbachir@teknova.no)

Visiting address Kristiansand: Tordenskjoldsgate 9, 5. floor.

Visiting address Jon Lilletunsvei 9, Bygg J, third floor, 4879 Grimstad.

Postal address: Teknova AS, Tordenskjoldsgate 9, NO-4612 Kristiansand, Norway

**[www.teknova.no](http://www.teknova.no)**

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