Digital Systems

Current stats

- 110 MNOK Turnover
- 58 MNOK HRP MTO project
- ~70 Employees

6 Departments:

- Control Room & Interaction Design
- Virtual & Augmented Reality
- Intelligent Systems
- Automation & User Monitoring
- Human Centered Digitalization
- Risk, Safety, & Security









HRP

7 Laboratories:

- HAMMLAB
- ATM lab
- VR/AR lab
- Future lab
- Human Centred Sensing lab
- Digitalization lab
- Cyber security lab

Digitalization

Digitalization is the use of digital technologies to change a business model and provide new revenue and value-producing opportunities; it is the process of moving to a digital business. (GARTNER, 2017) "Simplified, digitalisation is about how we can use digital technology to do more with less effort and get it done quicker, safer, and cheaper" (IFE, 2018)



Control Rooms & Interaction Design



Control Rooms & Interaction Design Department.

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Statnett

Hafslund 🚯

ABB

Honeywell

aibel

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FMFRSON

ndustrial Automa

AkerSolutions

bp

DNTNU

AVINOR

ConocoPhillips

Statoil

() SAAB

SIEMENS

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SLKAB Eidsiva

NORGES BANK

- Our research focus on working environments (e.g. control rooms) and how to make data easily perceivable as information to the user. Borregaard
- **Deliverables:** •
 - control room design,
 - information graphics and
 - software solutions.

Virtual & Augmented Reality











Intelligent Systems From Data to Information



35 years of AI



V.C. Summer Nuclear Station USA

Fault Diagnosis through Transient Classification using recurrent neural networks VC Summer Nuclear Power Plant in the USA (2002) A large Oil and Gas company

Analysis and prognostics Calculate technical index and remaining useful life for process equipment

ConocoPhillips Norway

Neural Network to Estimation of NOx emission of gas turbines on offshore platforms ConocoPhillips Norway (2009) Loviisa Nuclear Power Plant Finland

Fault identification ability of physical models Fortum - Loviisa Nuclear Power Plant in Finland (2000) Orskarshamn Nuclear Power Plant Sweden

Feed Water Flow, Use of Almodel, Detect 3 kg/s drift, Safety margin, ±3.5 MNOK/y income recovery (2000) Kjeller Nuclear Reaktor Norway

Remaining Useful Life estimation of air filters (2013)

Automatisering og Brukerovervåkning



Automation & User Monitoring

Human-automation interaction



Evaluate how humans use and respond to digital and AI systems in complex operating environments, such as train dispatch or traffic monitoring centers

Human collaboration with technology



Develop smart monitoring systems to detect and respond to fatigue, distraction, stress or high workload in drivers and controllers



Investigate user perceptions and trust in automation and the ethical issues related to collecting data about users



Understand and explain the behaviours, benefits and limitations of AI systems for users, manufacturers and regulators

Automation & User Monitoring



Human-Centred Digitalization



Risk, Safety & Security

85%

