Mechatronics Demo Day & Circus

Kari Tammi

7.4.2022 at Aalto University

Aalto-yliopisto
Aalto-universitetet
Aalto University

Mechatronics group actuals 2021

MSc theses: 22

Journal publications/ all publications: 17 / 30

Doctoral theses: 4

New (major) projects: HiECSs (Centre of Excellence), GOOD, Nanotrust

AIIC Club

Digital Twin Web Association (https://www.dtwa.org/)

K3 building gradually ready: http://k3-cam.aalto.fi

High-Speed Electromechanical Energy Conversion Systems (HiECSs)

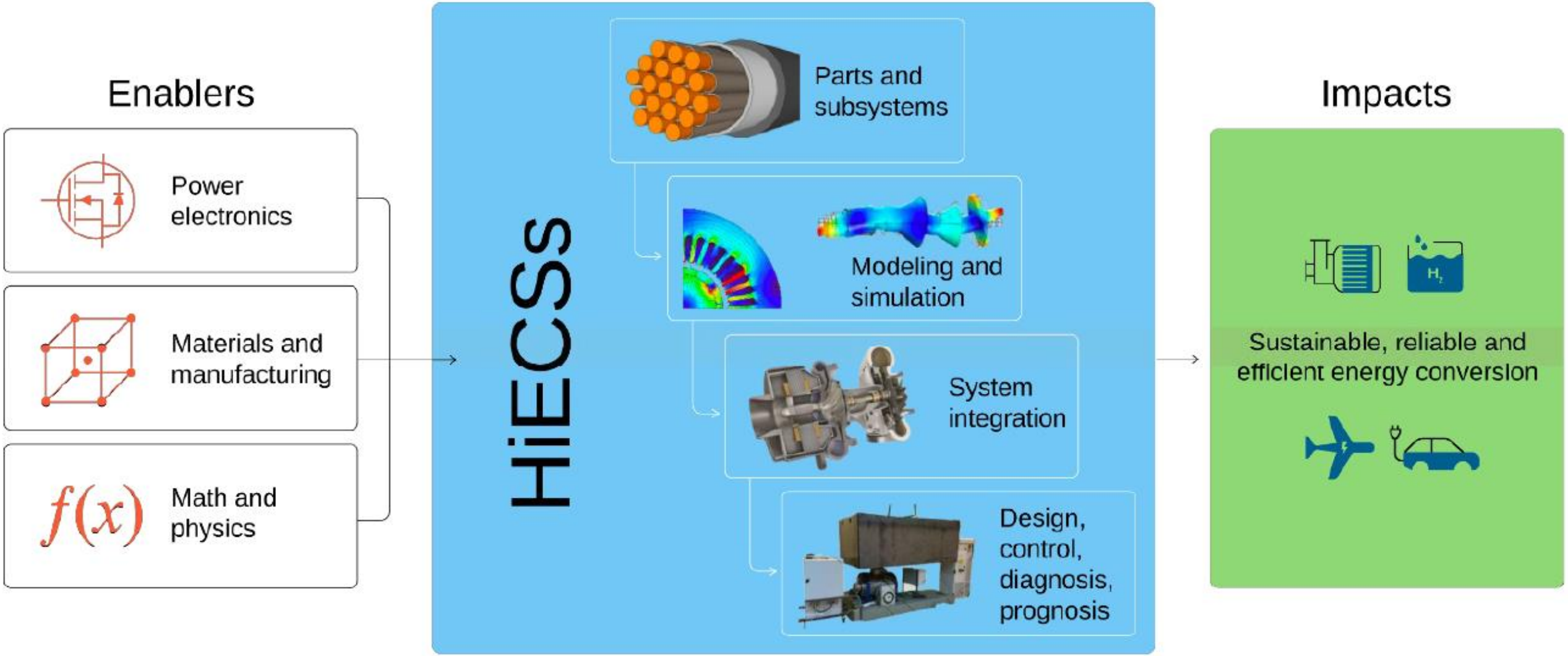
Academy of Finland Centre of Excellence

Kari Tammi, Raine Viitala, Petri Kuosmanen

Aalto-yliopisto
Aalto-universitetet
Aalto University

School of Engineering

HiECSs overview



Partners

Aalto University School of Electrical Engineering (Prof. Belahcen)

Aalto University School of Engineering (Prof. Tammi)

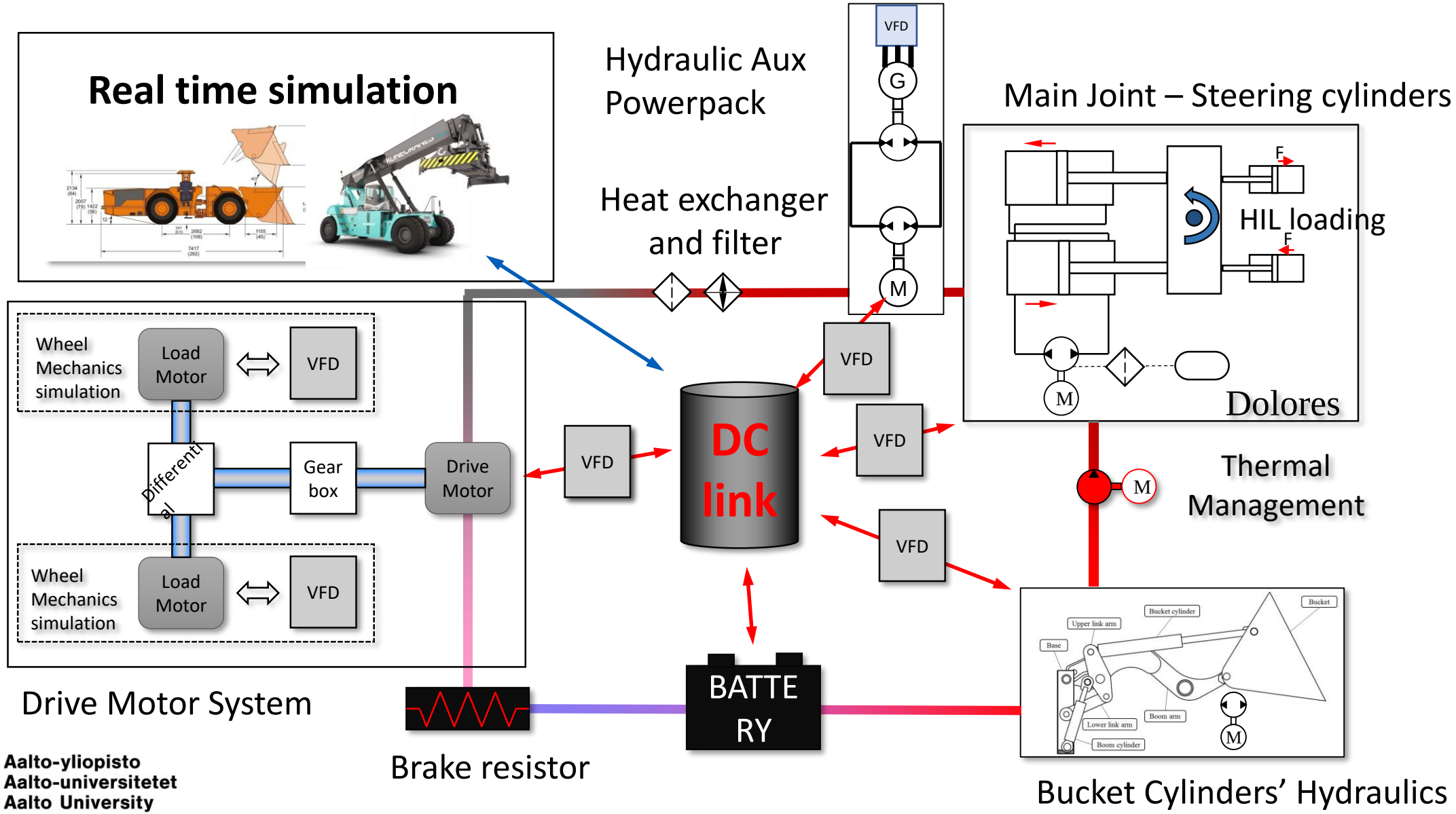
LUT University (Prof. J. Pyrhönen)

Tampere University (Prof. Rasilo)

VTT – Technical Research Centre of Finland (Dr. Pippuri-Mäkeläinen)

CSC – IT Center for Science (Dr. Råback)

Mobile Electrical Machine Research Platform (GOOD project)



Aalto-yliopisto
Aalto-universitetet
Aalto University

A!ex autonomous car

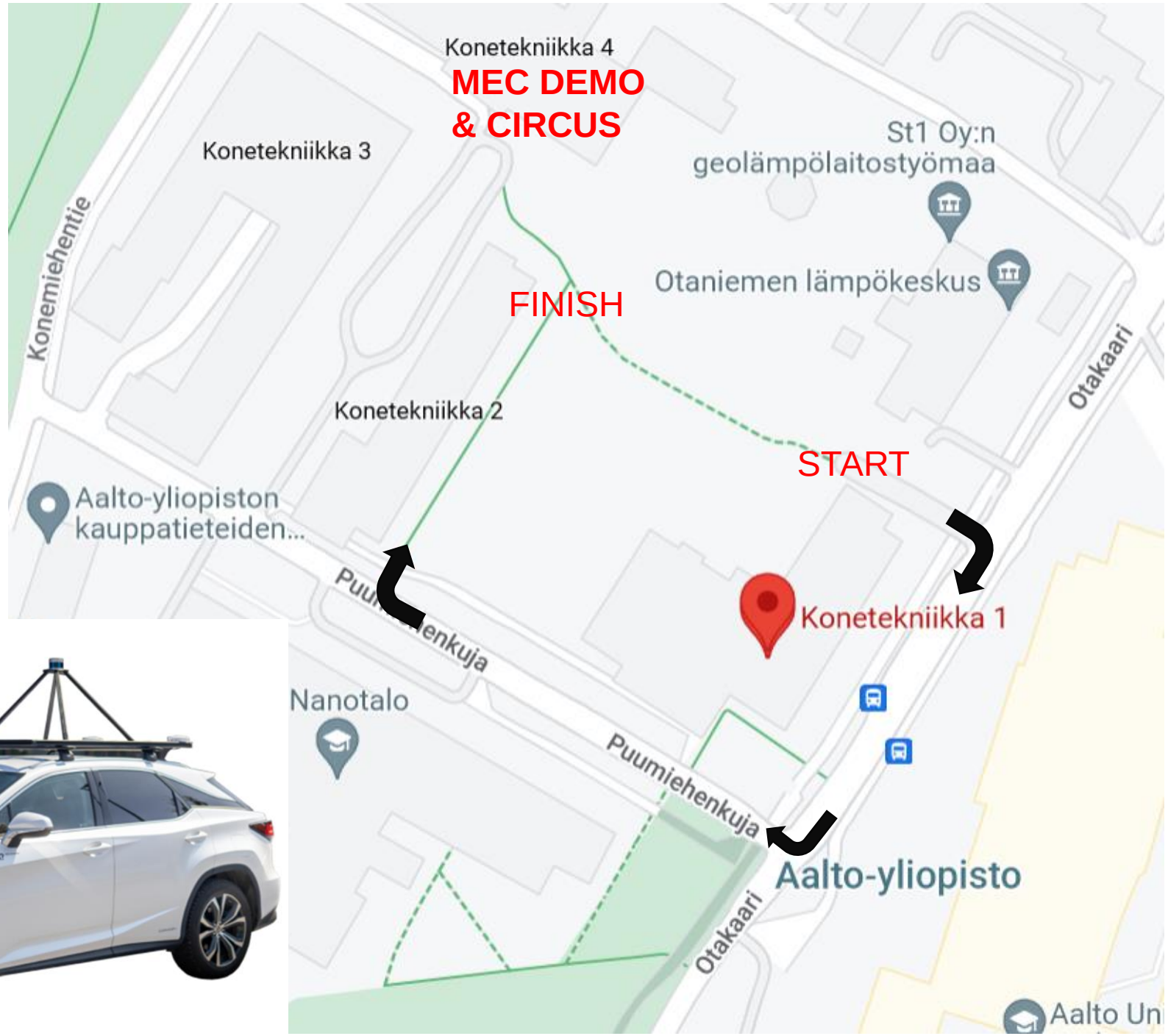
https://acas.fi/alex/

Reliability of operation in the challenging finnish climate, analysis of sensor system accuracy and sensitivity

Demo route video (YT)

Get on ride?

- **A!ex operates today around Konetekniikka 1 (K1) building**



Aalto-yliopisto
Aalto-universitetet
Aalto University

Machinaide project
2019–2023

MACHINAIDE

19 partners

4 countries

ITEA 3 Call 5

Smart industry

Oct 2019 - Jun 2023

ITEA3

Finland

Netherlands

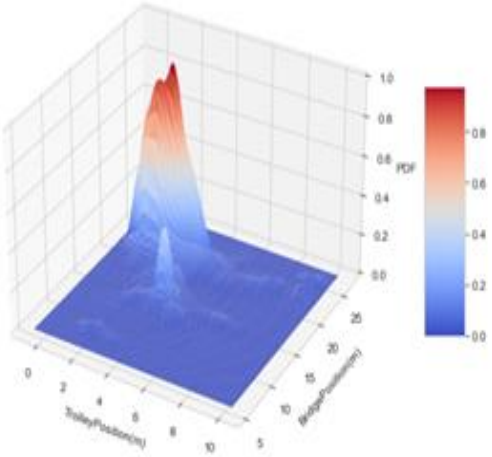
Turkey

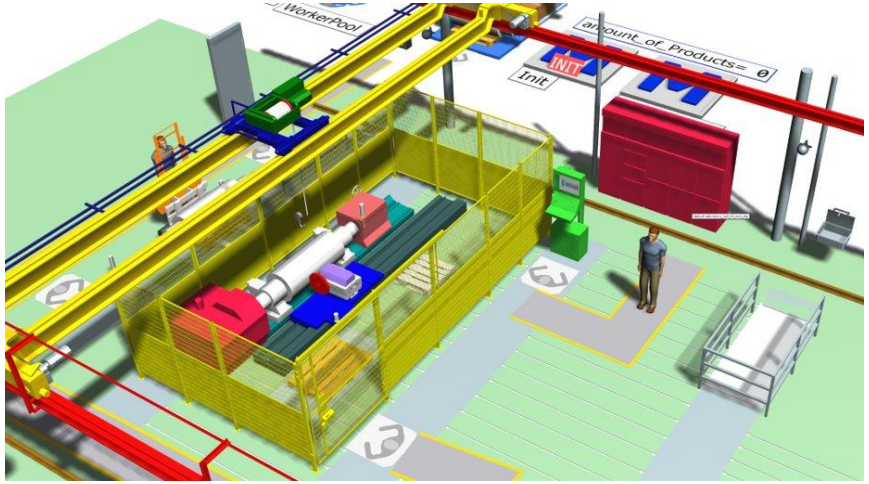
Rebublic of Korea

https://www.machinaide.eu

Better Digital Twins for seamless digitalisation

- Machinaide creates solutions to connect industrial ecosystems
- Human Machine Interfaces (HMI) for the Digital Twins, Internet 4.0 and Industrial Internet of Things and machines
- Applications to present processed information from Digital Twins





Work Packages

- **WP1: Use Cases, requirements and evaluation**
- **WP2: Interoperability between Digital Twin ecosystems**
- **WP3: Processing of multiple Digital Twin´s data**
- **WP4: Innovative Human Machine Interfaces for DT´s and services**
- WP5: Information usage across the machine **Life cycle**
- **WP6: Business models**
- WP7: Dissemination
- WP8: Project management

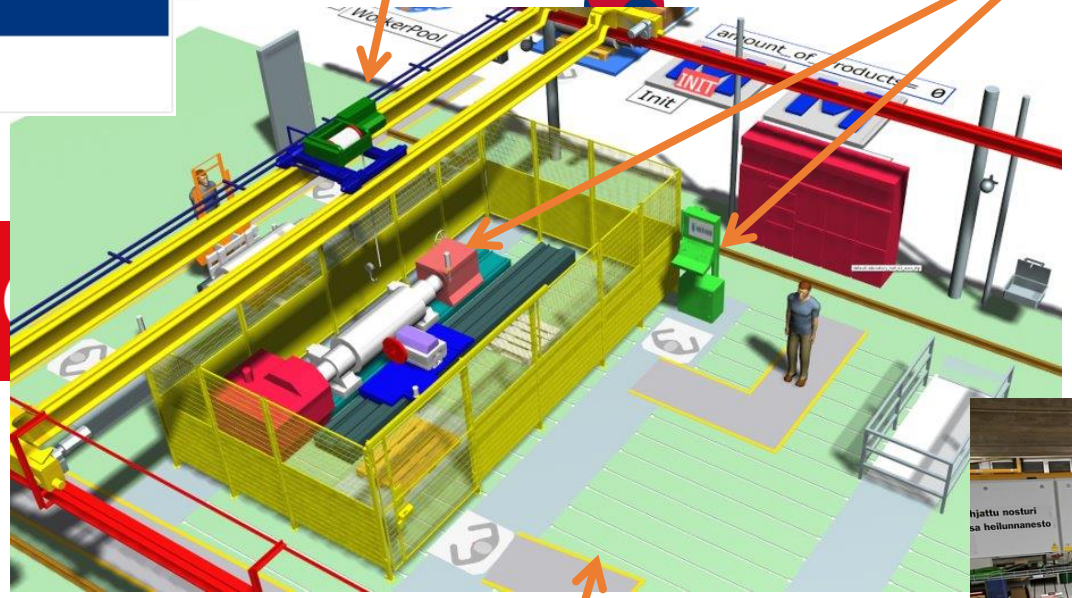
Smart factory ecosystem

KONECRANES®

Smart crane “Ilmatar” and crane ecosystems

RollResearch

Virtual Grinding machine with real control hardware



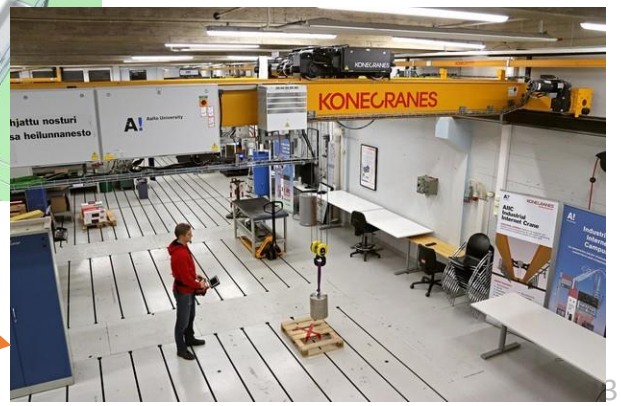
VTT

Business models

IDEAL GRP

REMION

Software and applications

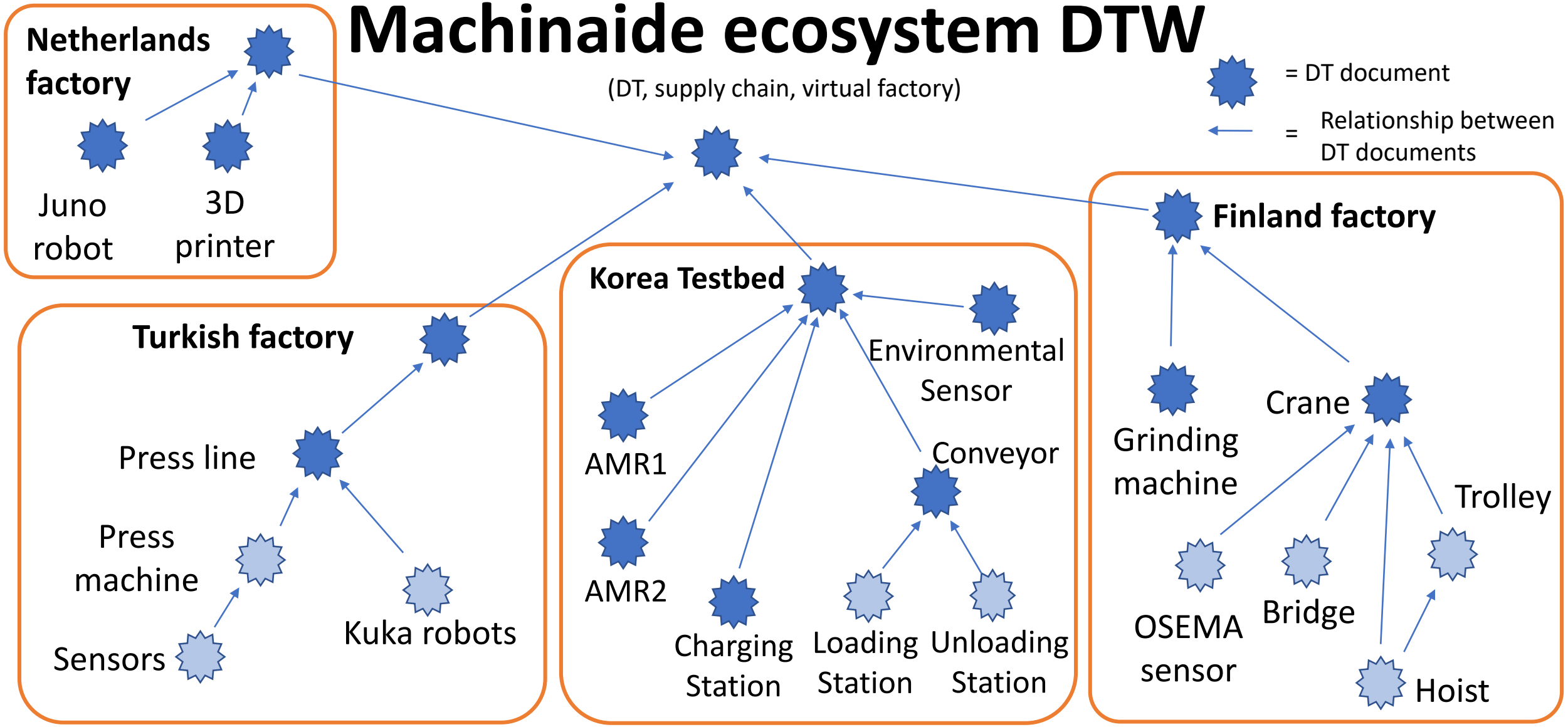


A! Aalto University

Aalto Industrial Internet Campus

Machinaide ecosystem DTW

(DT, supply chain, virtual factory)



Twin documents available: https://dtw.machinaide.twinbase.org/

ITEA 3

BUSINESS FINLAND

IDEAL GRP

TU/e EINDHOVEN UNIVERSITY OF TECHNOLOGY

CIP SYSTEMS

KONECRANES®

VTT

teknopar Endüstriyel Otomasyon

ETRI Electronics and Telecommunications Research Institute

REMION

CORDIS SUITE

Additive Industries

KE-works

RollResearch

ER METAL

Aalto University

DAKIK YAZILIM TEKNOLOJİLERİ

TNO

DOĞRU BİLGİ TEKNOLOJİLERİ

ERSTE

LELY