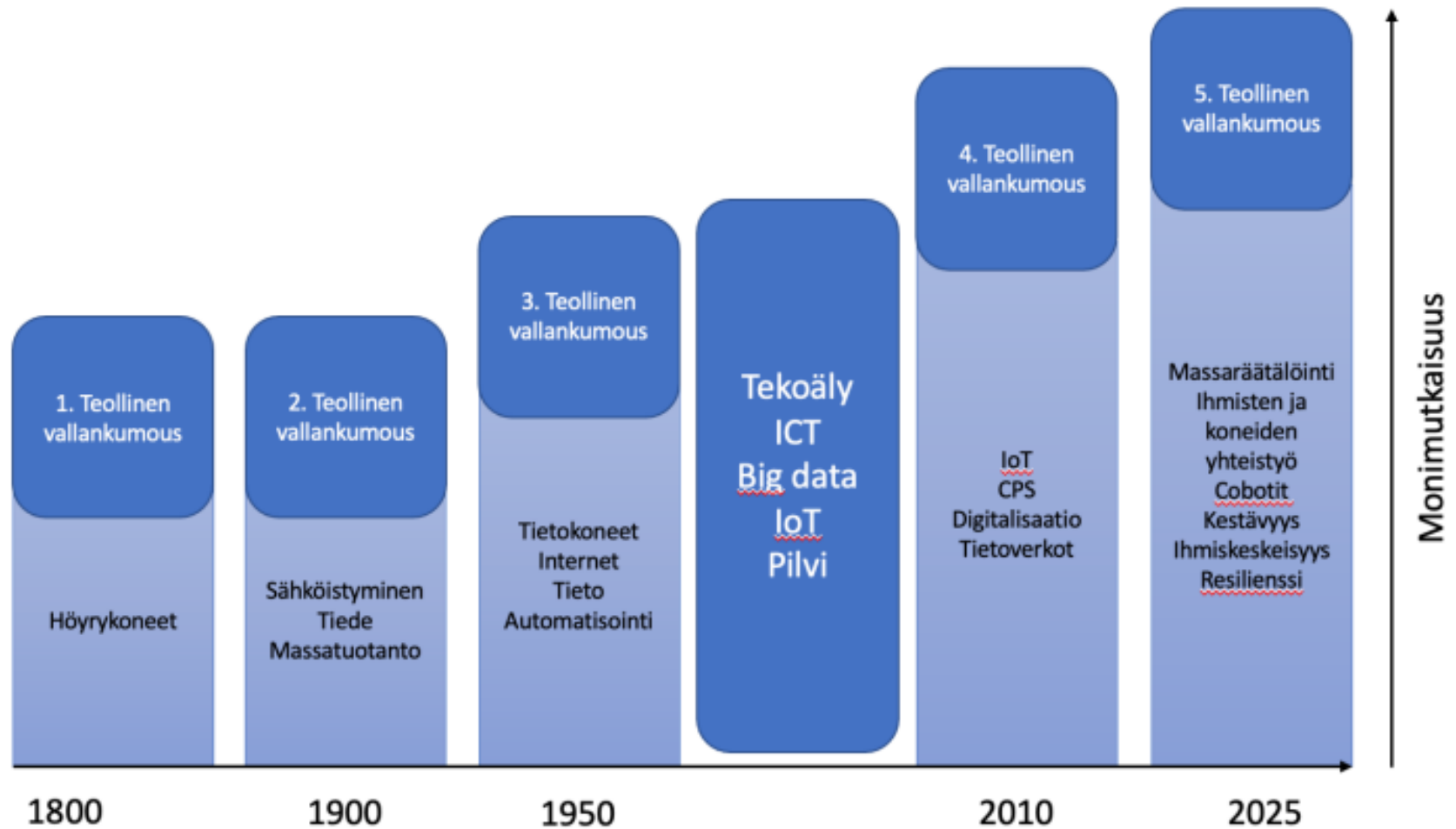




Koulutuksen järjestäjien näkökulmia teolliseen vallankumoukseen 4.0 ja 5.0

Marko Kortetmäki
Yliopettaja, koulutusvastaava

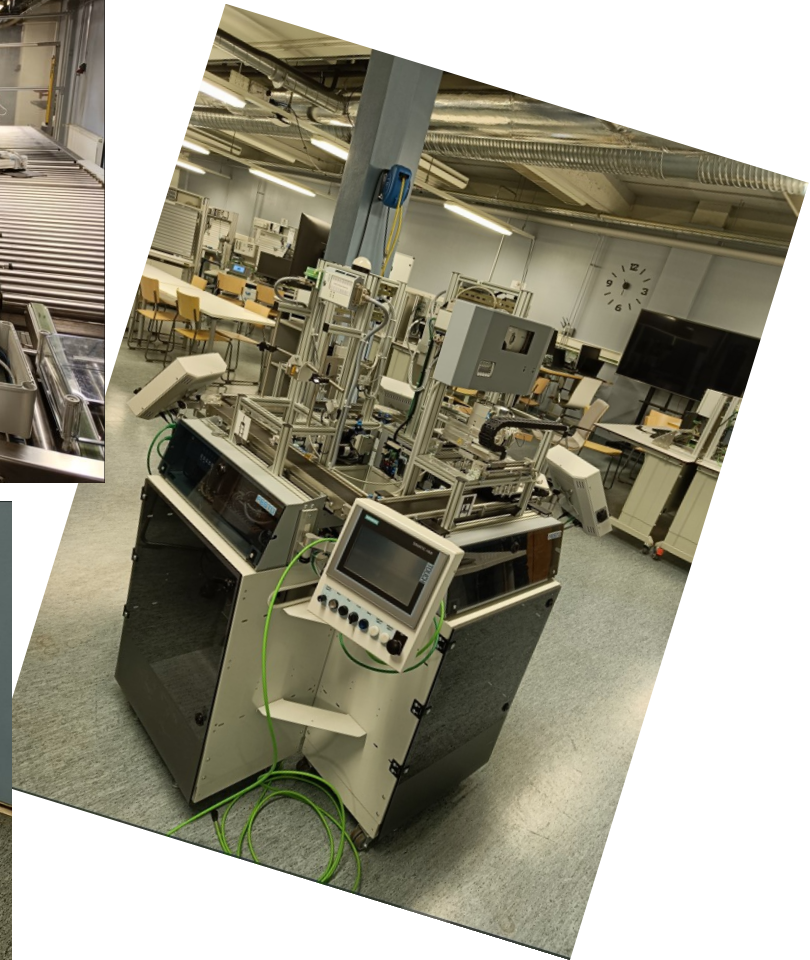
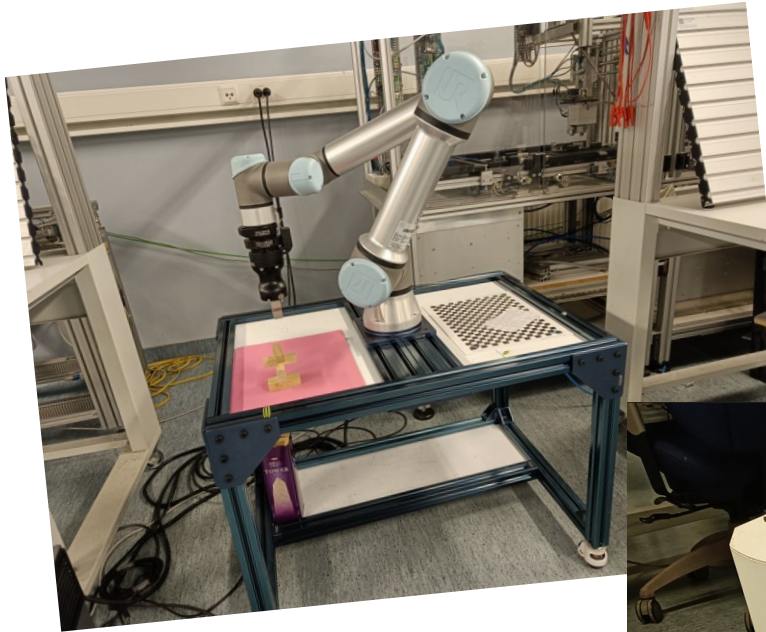
Teolliset vallankumoukset ja niiden ominaisuuksia



Teollisuus 4.0 teknologiat



Teollisuus 4.0



Skill “Industry 4.0” Competition Set


Festo Didactic CP Lab aligned with WorldSkills Standards on Industry 4.0

Single workplace and system workplace offer designed to budget for single or multiple teams preparation

With both the single and system workplace, Festo Didactic offers you a training system especially designed to prepare candidates for the challenges of the new skill Industry 4.0. The technical equipment of the workplaces are naturally aligned and in accordance with WorldSkills regulations. The Single Workplace Equipment will be the official competition material for the Shanghai 2022 event. Both workplaces are fully assembled with the shown equipment. While the single workplace is ideal to train two learners, the system workplace enables students to simulate a factory environment and discover the connectivity of a real Industry 4.0 production.


Single workplace equipment		System workplace equipment
<ul style="list-style-type: none"> 1x CP Lab Carriage 1x CP Lab Conveyor DC-1512SP 1x CP Lab HMI Case 1x CP Lab Touch Panel TP700 Comfort 1x Tabletop Supply Unit 1x CP Lab Application Module iDrill 1x Set of work pieces 1x NetLab Twin Package 1x Energy Measurement System 1x Energy Monitoring Package 1x Web shop for MES4 1x Equipment Set TP 1312 Smart Sensors 1x IoT Gateway 1x CIROS Software License 1x MES4 Licence for CP Lab 1x PC with TFT-monitor for MES 1x TIA Portal 		<ul style="list-style-type: none"> 4x CP Lab Carriage 4x CP Lab Conveyor DC-1512SP 4x CP Lab HMI Case 4x CP Lab Touch Panel TP700 Comfort 4x Tabletop Supply Unit 1x CP Lab Application Module iDrill 1x CP Lab Application Module Magazine 1x CP Lab Application Module Measuring 1x CP Lab Application Module Output 4x Set of work pieces 1x NetLab Twin Package 1x Energy Measurement System 1x Energy Monitoring Package 1x Web shop for MES4 1x Equipment Set TP 1312 Smart Sensors 1x IoT Gateway 1x CIROS Software License 1x MES4 Licence for CP Lab 1x PC with TFT-monitor for MES 4x TIA Portal

- Koulutuslaitteistosta esimerkki
- 4:n modulin kokonaisuus CP-Lab (Festo)
- Laitteisto Koneteknologiakeskuksessa
- Oppilaitosten yhteiskäytössä












worldskills
Shanghai 2022

Included in both workplaces:




worldskills
Shanghai 2022

	<p>iDrill</p>  <p>The intelligent drilling application module provides control, communication and self-diagnostic capabilities</p>	<p>Smart Sensors</p>  <p>ID-Link sensors enable real-time monitoring and smart applications</p>	<p>IoT Gateway</p>  <p>An edge computing gateway connects the shop floor to the Industrial Internet of Things</p>	<p>Energy Measurement Box</p>  <p>Industrial power and air sensors are integrated into a monitoring system</p>
	<p>NetLab</p>  <p>Two Managed switches and two Firewall routers enabling IT security and support scenarios</p>	<p>CIROS</p>  <p>CIROS allows the factory simulation including faults and process optimization</p>	<p>MES4</p>  <p>With MES4 the production is controlled easily and transparently</p>	<p>Energy Monitoring</p>  <p>Energy Dashboards provide transparency and support efficiency improvements</p>
				<p>Web Shop</p>  <p>The configurable web shop connects eCommerce and shop floor</p>



For more information on the single workplace CP Lab, please find our offer here



For more information on the system workplace CP Lab, please find our offer here

Industry 4.0 – digitaalinen tuoteprosessi

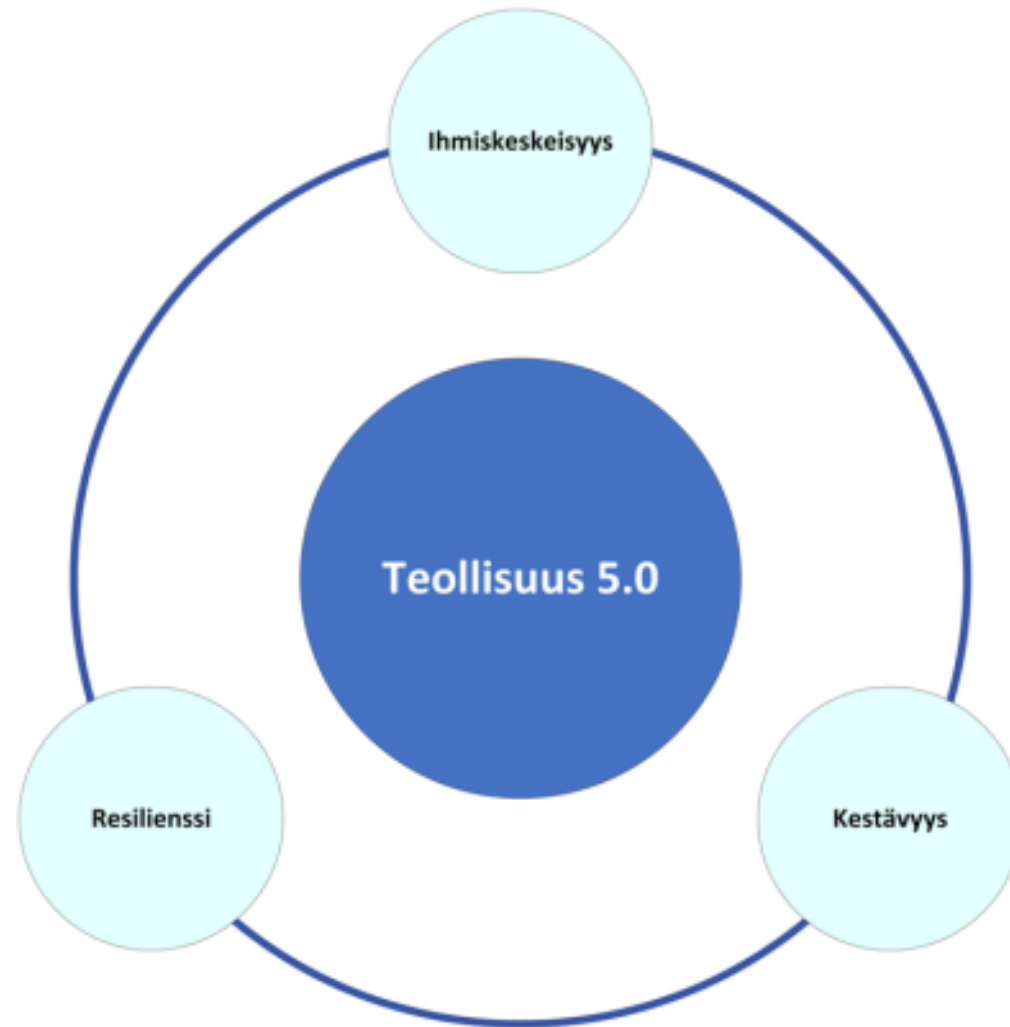
- CAD/PLM-suunnitteluympäristö
 - Hajautettu suunnittelu (Siemens NX/Teamcenter, Technomatix), Virtuaalitodellisuus
 - Global Design Project, korkeakoulupartnerit maailmanlaajuisesti
- Opetus virtuaalisesti
 - Virtuaalinen kaksonen
 - Digitaalinen tuoteprosessi (3D-skannaus, skannatun datan käsittely, tiedostoformaatit, 3D-tulostus)
 - Robottiikkaharjoittelu (RobotStudio)
 - Simulointi (lujuus, mekanismit, valmistus)
- Ainetta lisäävä valmistus, protoilu ja modernit valmistusmenetelmät
- Käänteinen suunnittelu (3D-skannaus/3D-mittaus)



Kohti teollisuus 5.0:aa

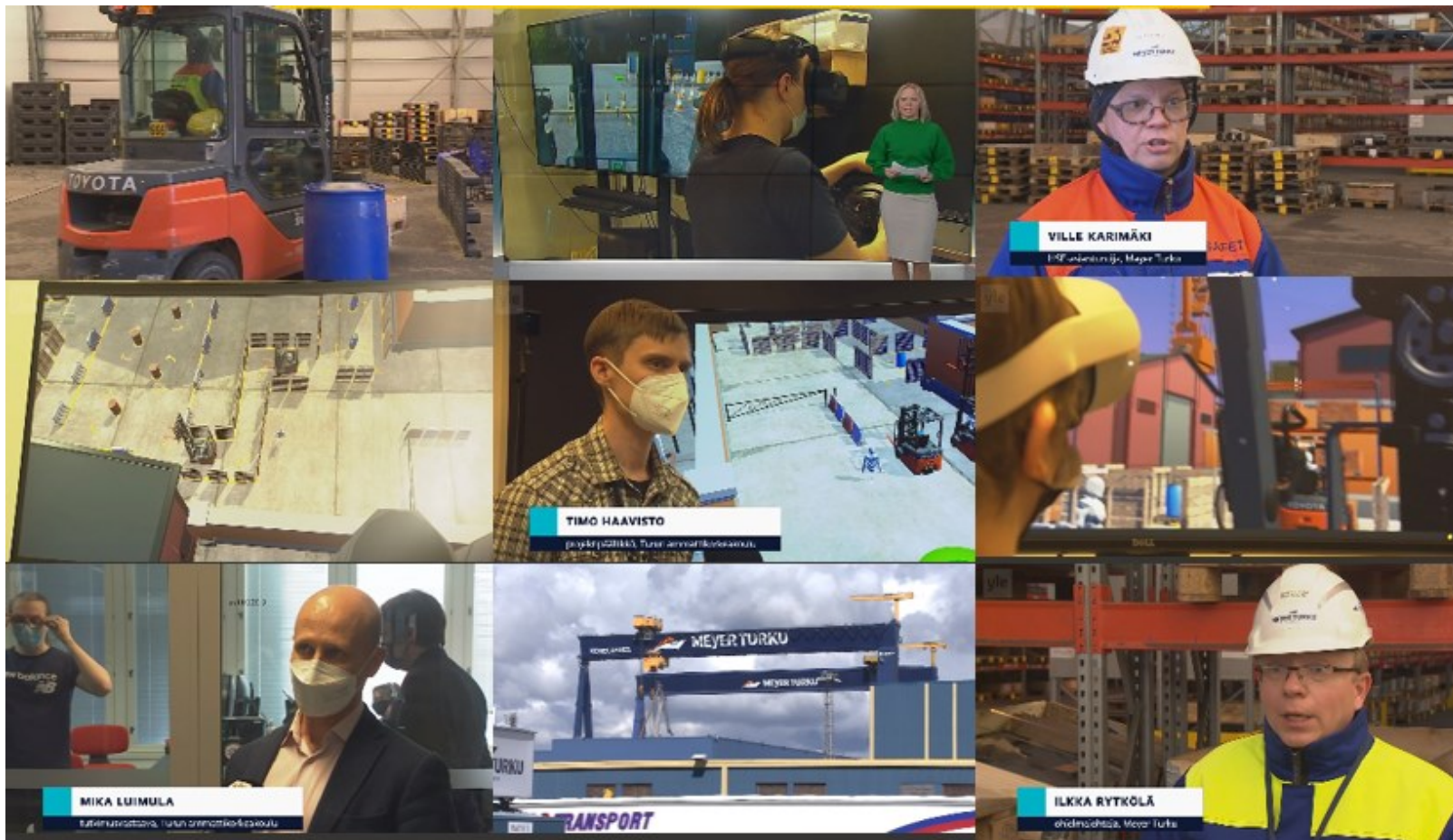


Teollisuus 5.0:n kolme pääajuria



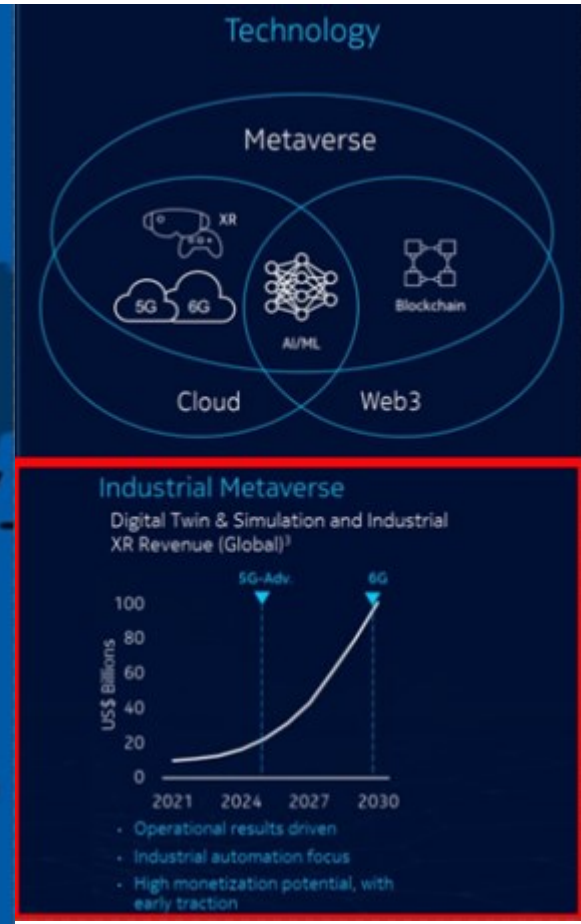
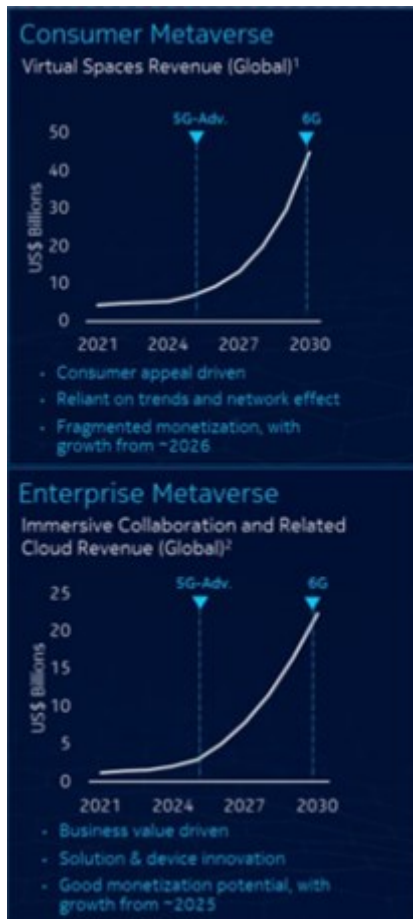
Industry 5.0

Turku University of Applied Sciences developed own metaverse technology – nowadays licensed by ProVerse Interactive Ltd.
This technology enables collaboration between humans.

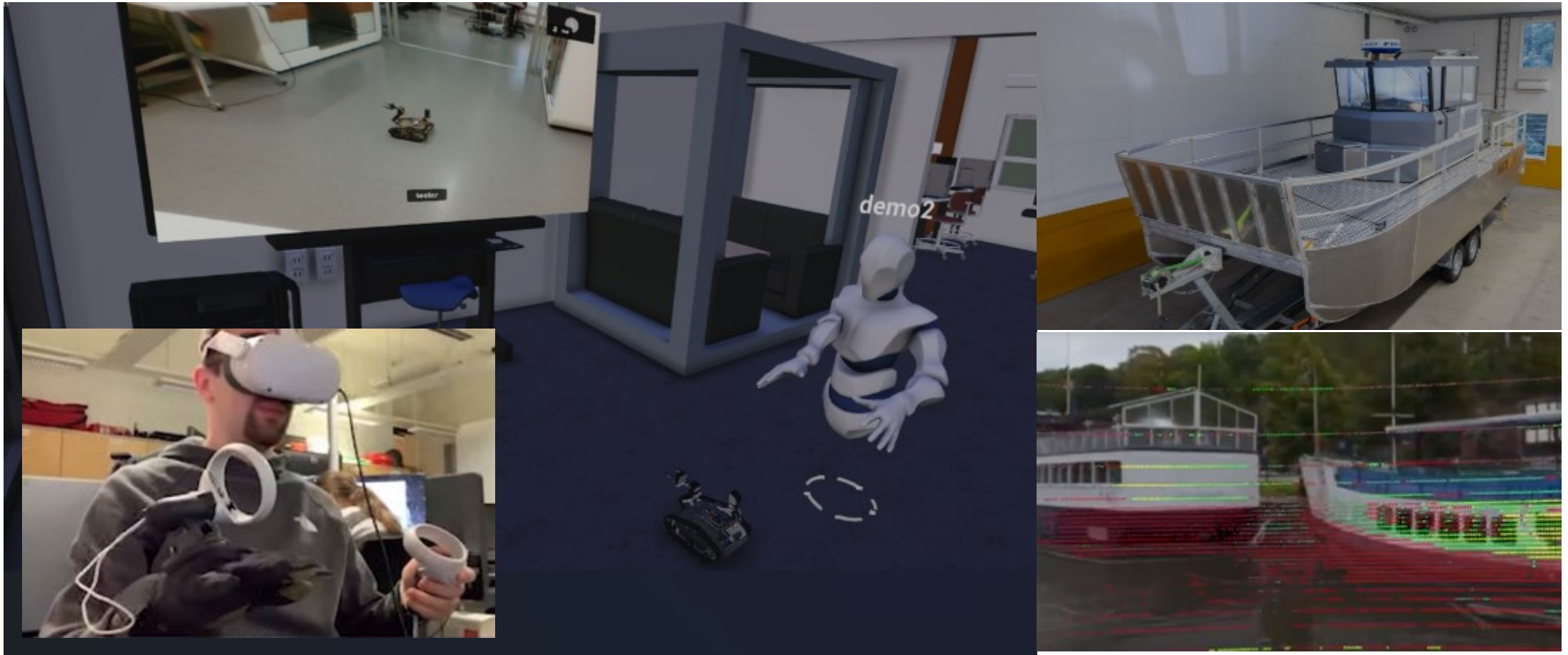


Industry 5.0

The use of industrial metaverse is a sustainable and resilient solution. Immersive three dimensional environment enables collaborative design and planning.



Towards Remote Controlled and Autonomous Systems





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