



Unmanned Robots as Indispensable Buddies for Humans!!!

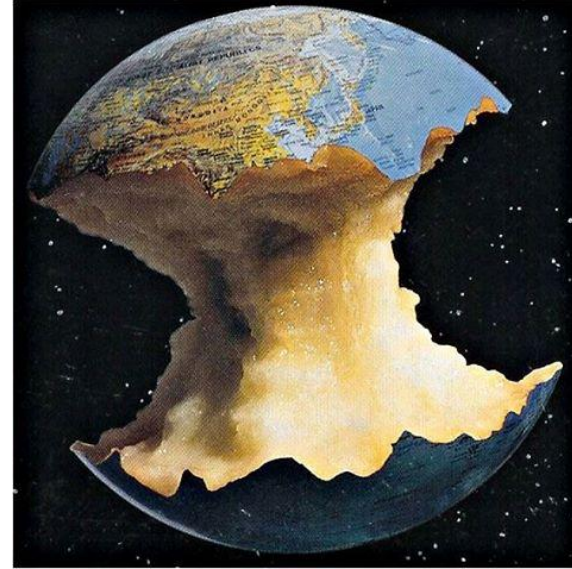
Welcome to the
KIVI
Annual Congress
2025

Abeje Yenehun Mersha, Saxion University of Applied Sciences



KIVI

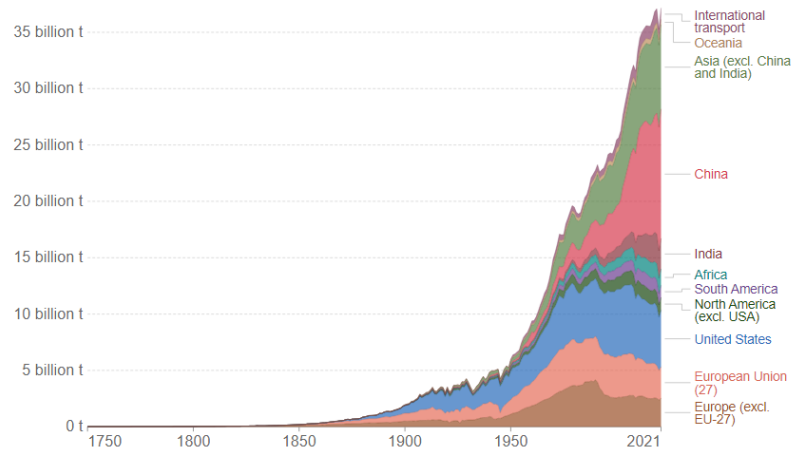
Societal Challenges



Annual CO₂ emissions by world region

This measures fossil fuel and industry emissions. Land use change is not included.

Our World in Data



Data source: Global Carbon Budget (2022)

OurWorldinData.org/co2-and-greenhouse-gas-emissions | CC BY

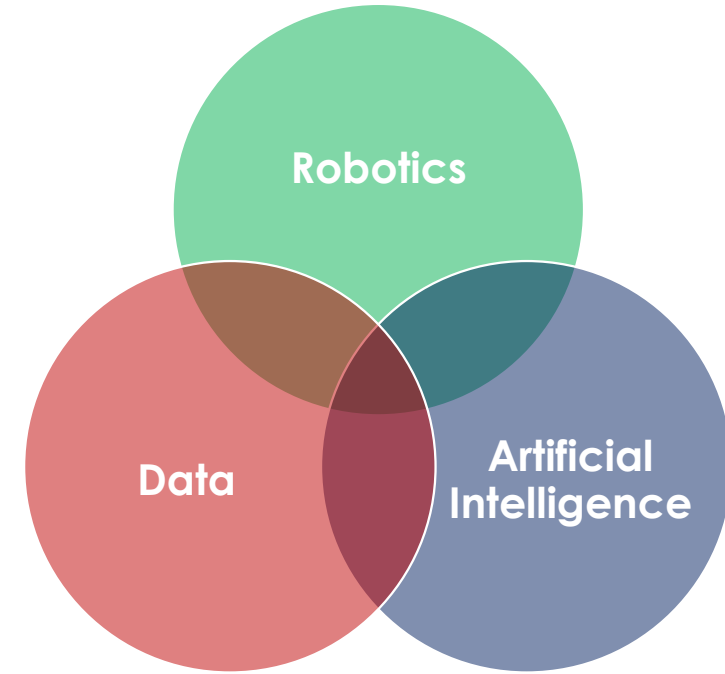


Solution for NOW without comprising the FUTURE

Technology: Indispensable

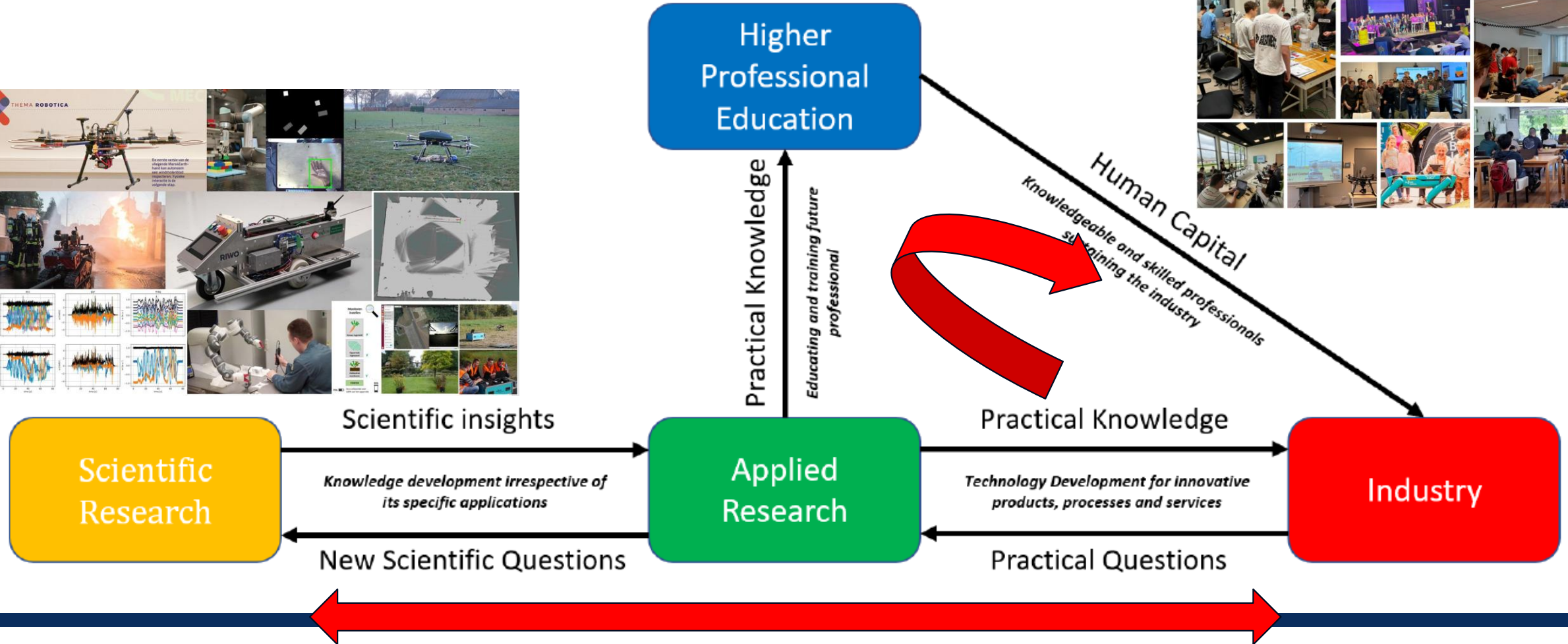
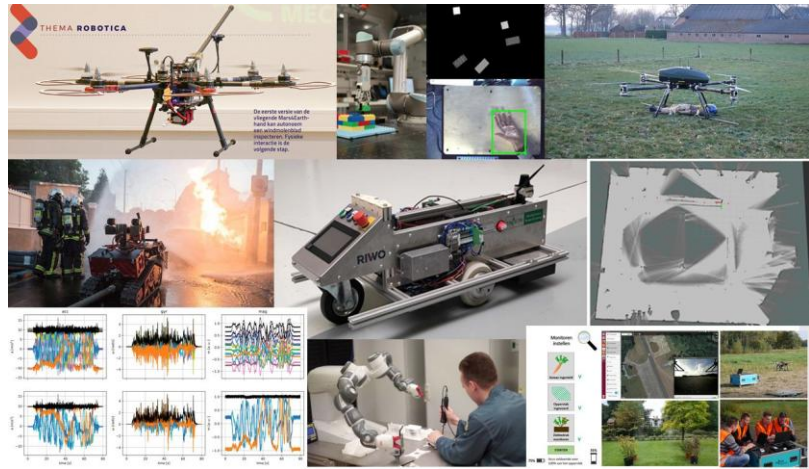


Unmanned Robotic Systems



Integral part of sustainable solutions

Applied Research: Demand-Driven

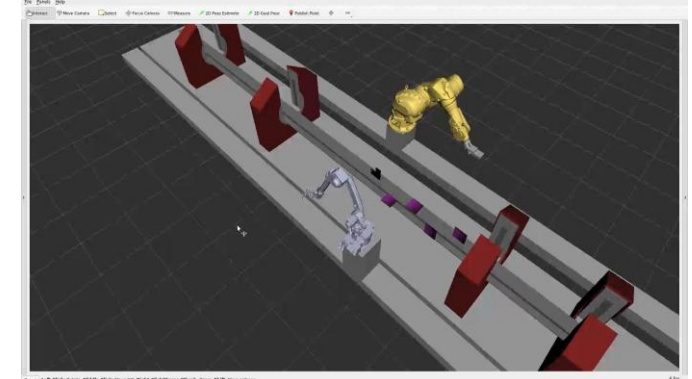


R & D for SMEs

Mission-driven Applied Research

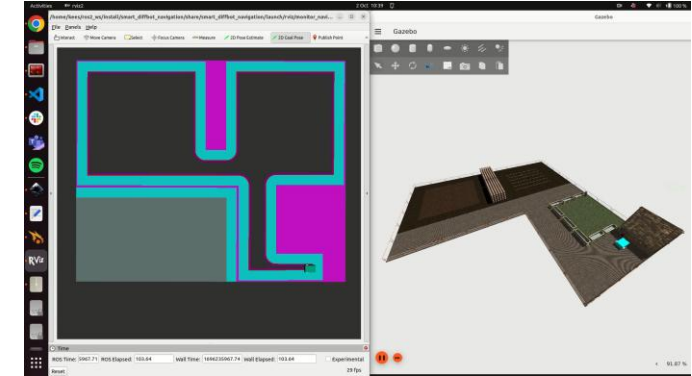
SMART MECHATRONICS AND ROBOTICS

Mechatronic Systems



Lab Environments

Digital World



Where systems engineering and Modular robotics result into unique innovations

Firefighting drone



Two deaths by brand appartementencomplex Delden, burgemeester 'diep geraakt'



Het appartementencomplex in Delden SPS MEDIA / DOMINIQUE GEMSER



NOS Nieuws • Maandag 19 juni 2023, 21:29

Brandweer pleit na brand in woonblok voor strengere bouwregels zonnepanelen



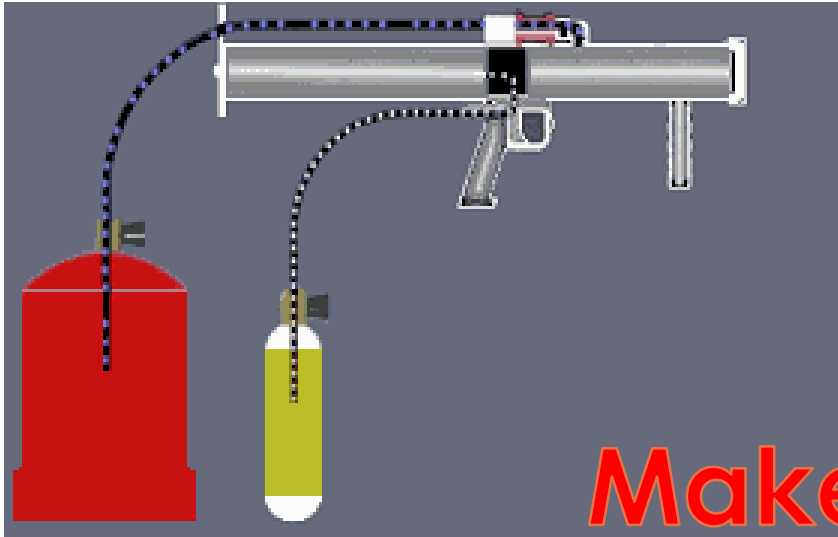
The Daily Telegraph

Slow and ineffective



Lots of extinguishing material

Impulse based fire extinguishing drone



IFEX working principle



IFEX in action

**Makes the difference
between life and death**



IFEX Drone



Weeding robot



Remember the corona effect in this sector?



Source: <https://www.britannica.com/science/herbicidemanual>

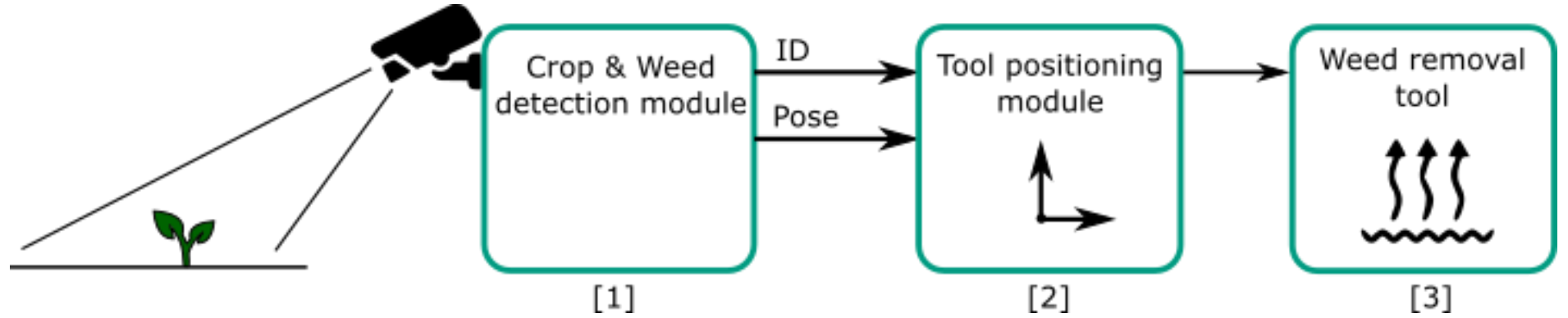
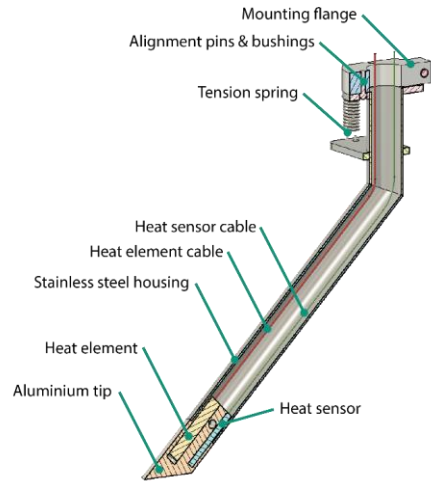
Impact on the environment

Labor intensive



Source: https://en.wikipedia.org/wiki/Weed_control

Modular Weeding Tool



Flying hand



Source <https://eur-lex.europa.eu/>



Winds of Change: Offshore Wind Farms at the Forefront of Energy Transition



cleaning



Laminating



Roller-painting

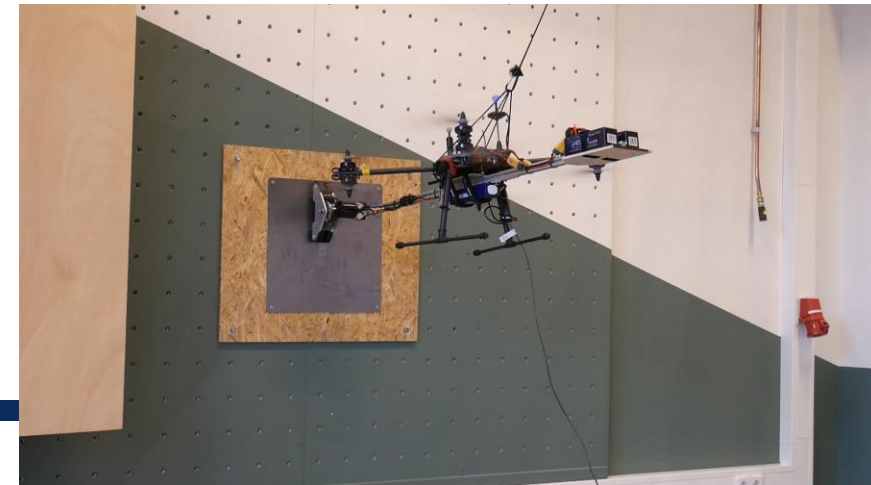


Grinding

Flying hand for inspection and maintenance



Current Approach



cleaning

Laminating

Roller-painting

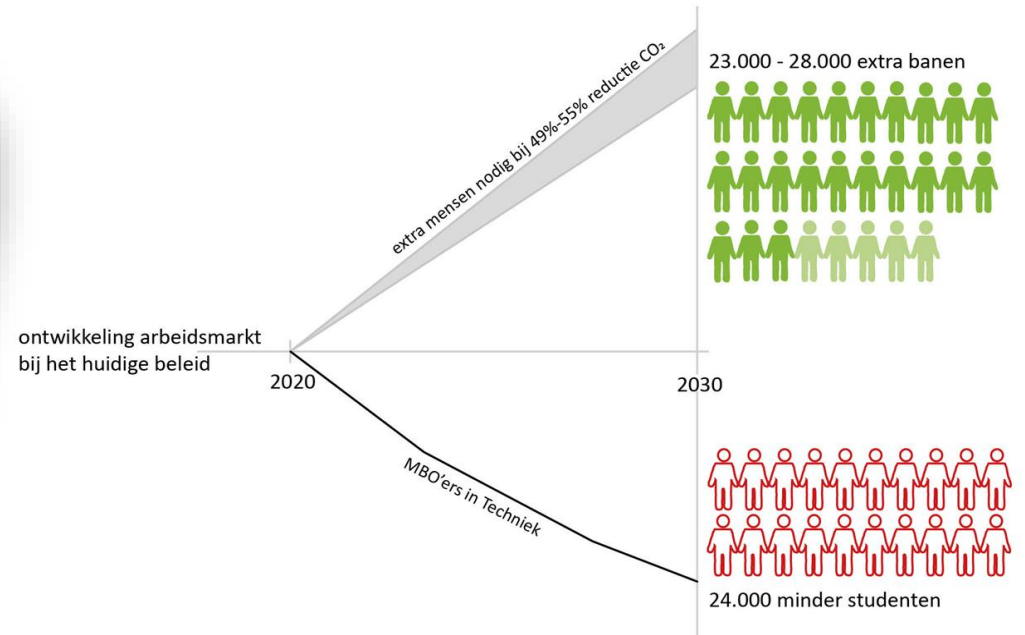
Grinding

Robot dog



Current Approach

10.000en vakmensen nodig voor energietransitie



bron: Klimaatbeleid en de arbeidsmarkt, verkennende studie naar de werkgelegenheidseffecten van CO₂-reductiemaatregelen (feb 2021, Ecorys), visualisatie NVDE



Demand vs Supply

CH4utonomous Robotic Inspection for Sustainable MAintenance (CHARISMA)



Technology is indispensable, but ...



**Contact-based Inspection
Maintenance**

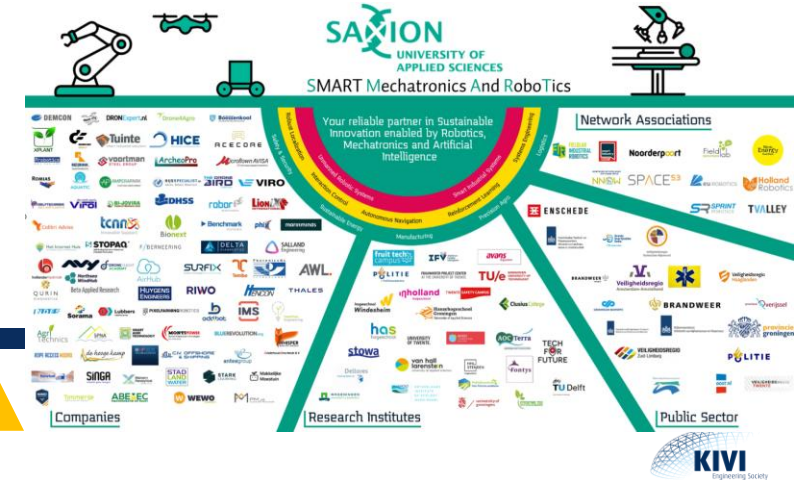
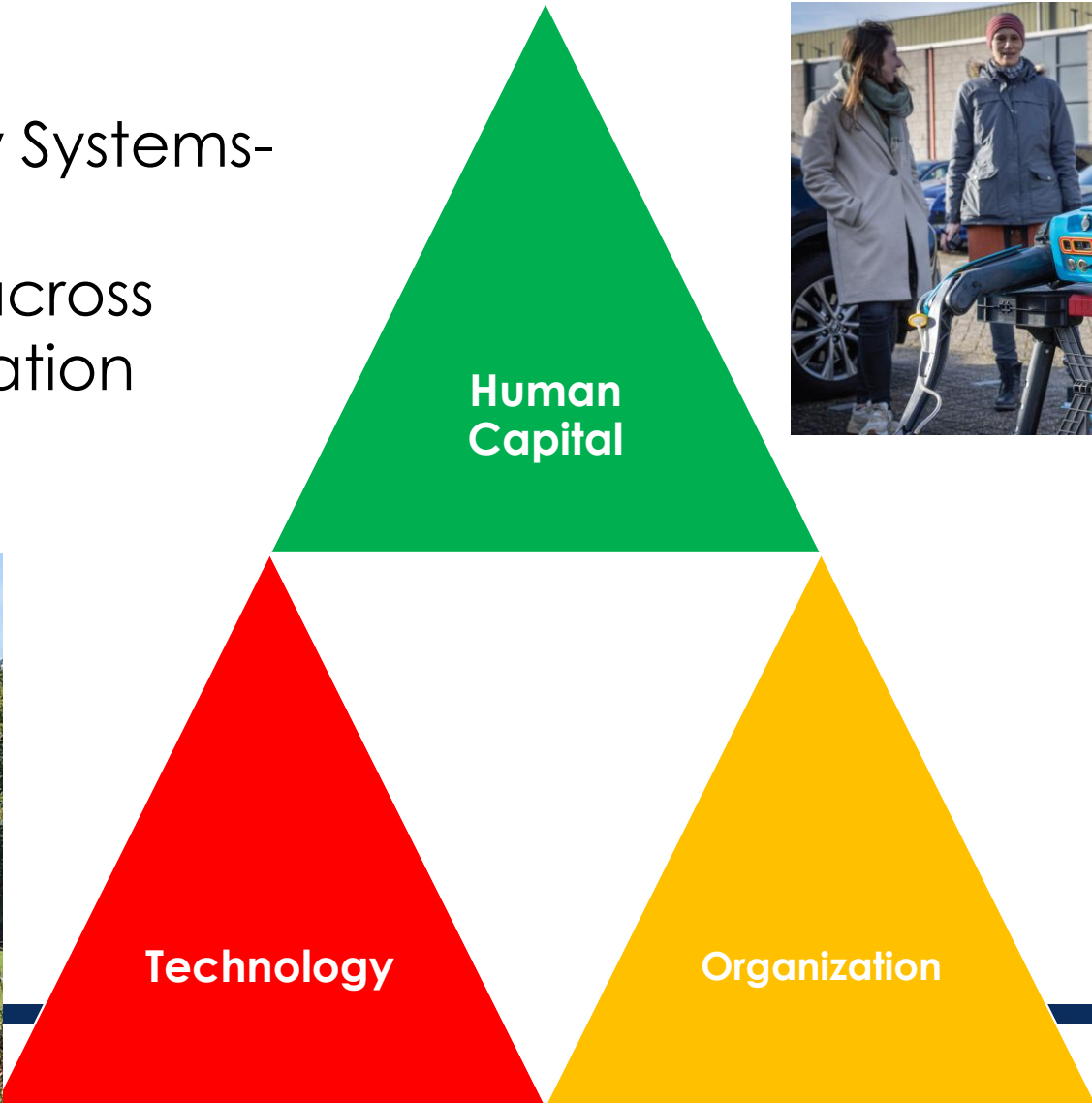


Fire-fighting Drone



Holistic Approach

- Multidisciplinary Systems-level approach
- Collaboration across various organization



Conclusion

- Facing Complex societal challenges
 - Climate change, labor shortage, raw material shortage
- Technology, especially unmanned robotic systems are indispensable
 - safety, efficiency, effectiveness
- Technology alone does not offer complete solution
 - Technology, human capital, organization
 - Multidisciplinary approach
 - Synergetic collaboration

**Engineers are
desperately needed**

Contact

