

Institut für Mechatronische Systeme

Presentation of LUH-IMES for EDF projects




Institute of Mechatronic Systems

18 full-time researchers and 2 administrative employees @
Campus Maschinenbau Garbsen, Leibniz Universität Hannover

Research Groups and Leaders

Learning & Control


Dr.-Ing. Simon Ehlers



- Data-driven Estimation and Sensor Fusion
- Learning Control of Mechatronic Systems

Robotic Systems


Dr.-Ing. Moritz Schappler



- Parallel Robots, Hyperredundant Kinematics
- Dynamic Learning and Sensorimotor AI

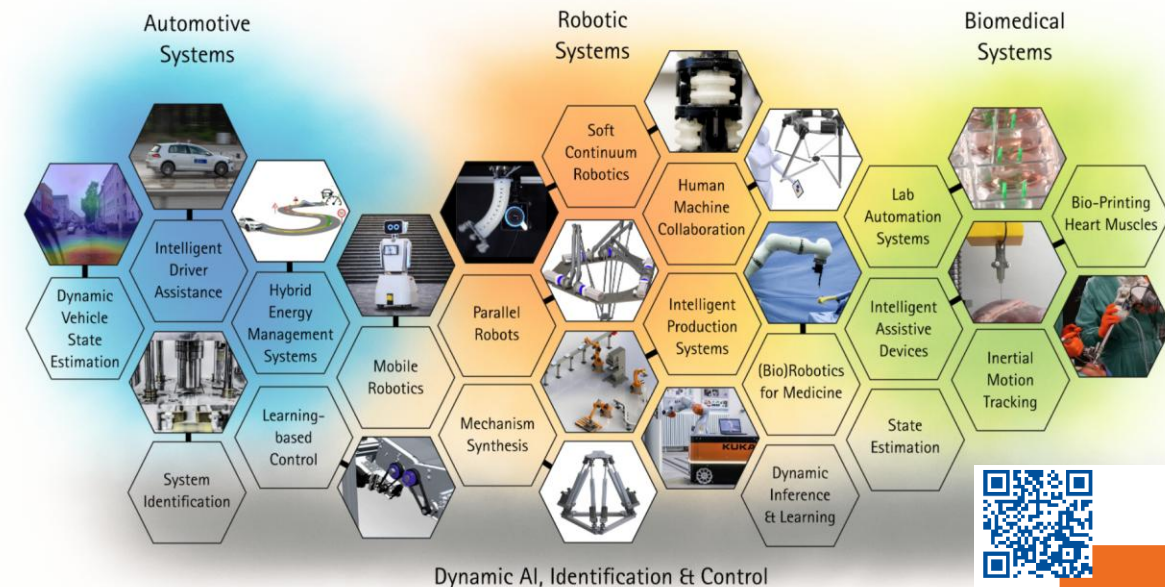
Biomedical Engineering

Leon Budde M.Sc.



- Robot- and AI-assisted Interventions
- Intelligent Assistive Health Technology

Head of Institute
Prof. Dr.-Ing. Thomas Seel



Project Sketch: Autonomous Repair

- Idea:
 - Mobile production and repair for (near-frontline) defence supply chains.
- Call: EDF-2026-LS-RA-SMERO-NT-STEP
- Partners:
 - Picum MT GmbH:
system and process expertise
 - IMES:
increase system autonomy via sensor fusion and online learning of motion and process parameters



PROVEN IN INDUSTRY

PICUM MT

Add-on research required for transfer from civilian application to defence

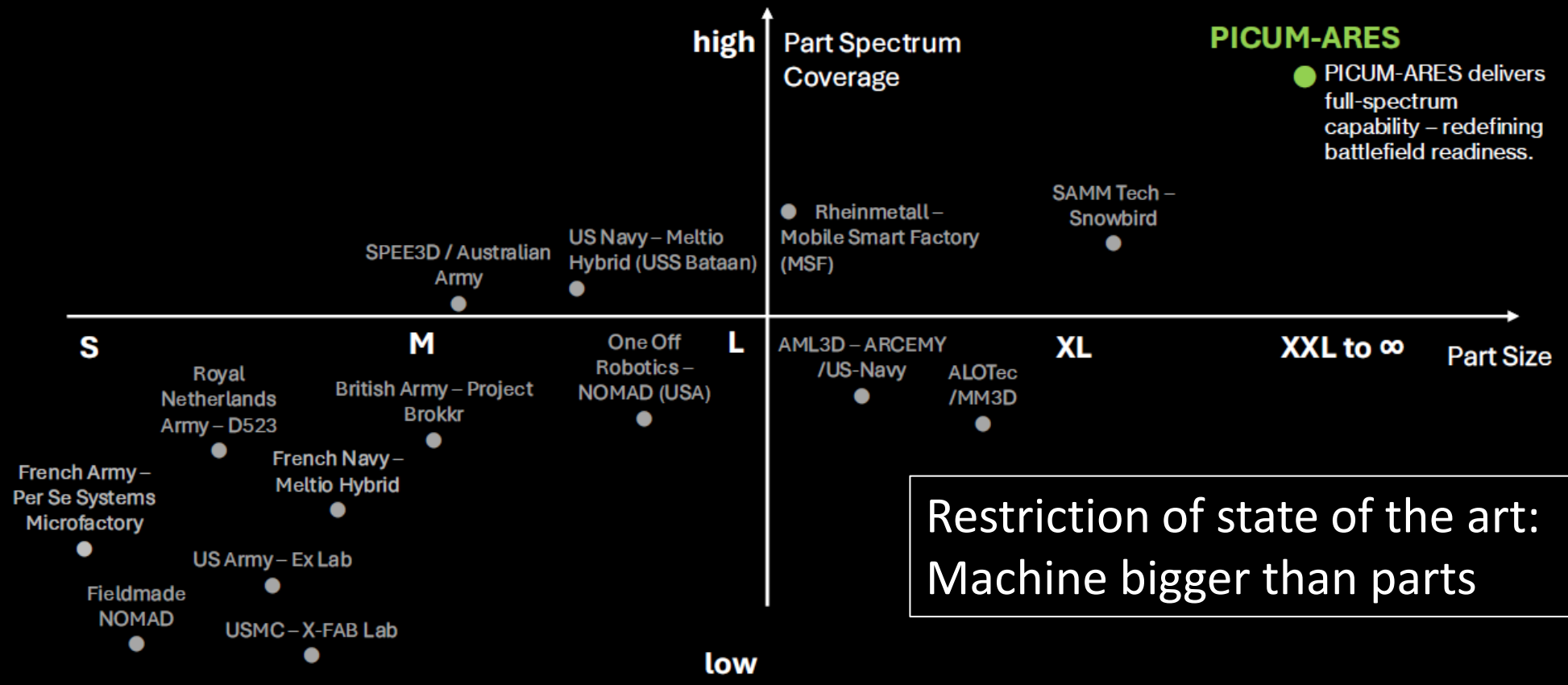
PROVEN IN 100+ INDUSTRIAL APPLICATIONS – MAXIMUM MATURITY, MINIMUM RISK. MOBILITY PROVED. NOW READY FOR DEFENCE DEPLOYMENT.
MEET BART AND LISA: THE WORLD'S ONLY MOBILE, HIGH-PRECISION, MULTI-TECHNOLOGY MANUFACTURING SYSTEM.

PICUM-LISA

PICUM-BART



MARKET LANDSCAPE



PICUM/ARES: System Architecture

PICUM MT



ADDITIVE TECHNOLOGIES
WAAAM, Laser-DED,
Cold Spray, FDM/FFF, Heat
Treatment

**MANUAL TECHNOLOGIES +
NDT/Metrology**
Arc-Welding, TIG, Cold Spray
(manual), CFRP-Repair

SUBTRACTIVE TECHNOLOGIES
Milling, Drilling, Polishing, Grinding

Project Sketch: Autonomous Repair (ARES)

- Next Steps: design of a defence product:
 - integration in a modular container-based manufacturing system
 - teleoperation and non-expert HMI
- Needed: Consortium of industrial, defence and research partners:
 - system and vehicle maintenance
 - prime defence contractors
 - robotics, production technology, materials and process simulation
 - communications and (cyber) security
- Contact: moritz.schappler@imes.uni-hannover.de

