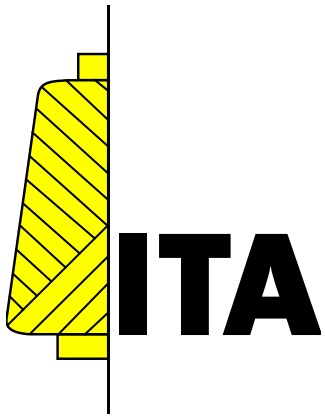
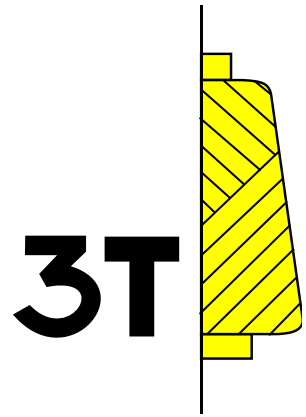
Flexible handling of work piece during textile manufacturing



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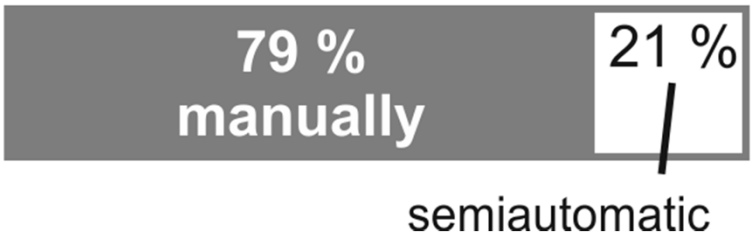


Flexible handling of work piece during textile manufacturing

Current situation

- Actual joining process (e.g. sewing, welding etc.) is known!

Survey: 415 companies of the automobil, footwear and protective clothing industry:



Source: *Szimmat, F.:* Beitrag zum Vereinzeln flächiger biegeschlaffer Bauteile. Dissertationsschrift an der Technischen Universität Berlin, Berlin 2007, Zugl. Stuttgart: Fraunhofer IRB, 2007

Flexible handling of work piece during textile manufacturing

Current challenge:

- Production (e.g. quality, output etc.) highly dependant on operator‘s experience and skill
  - Shortage of qualified operators in Europe
- Semi-automation of production process for technical textiles desired by industry
  - handling processes are major obstacle for automation

Aim:

- Development of a flexible handling device with a suitable machine program for automatic curved/shaped seam production adaptable to conventional sewing machines
  - supporting tool for operators

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Applications:





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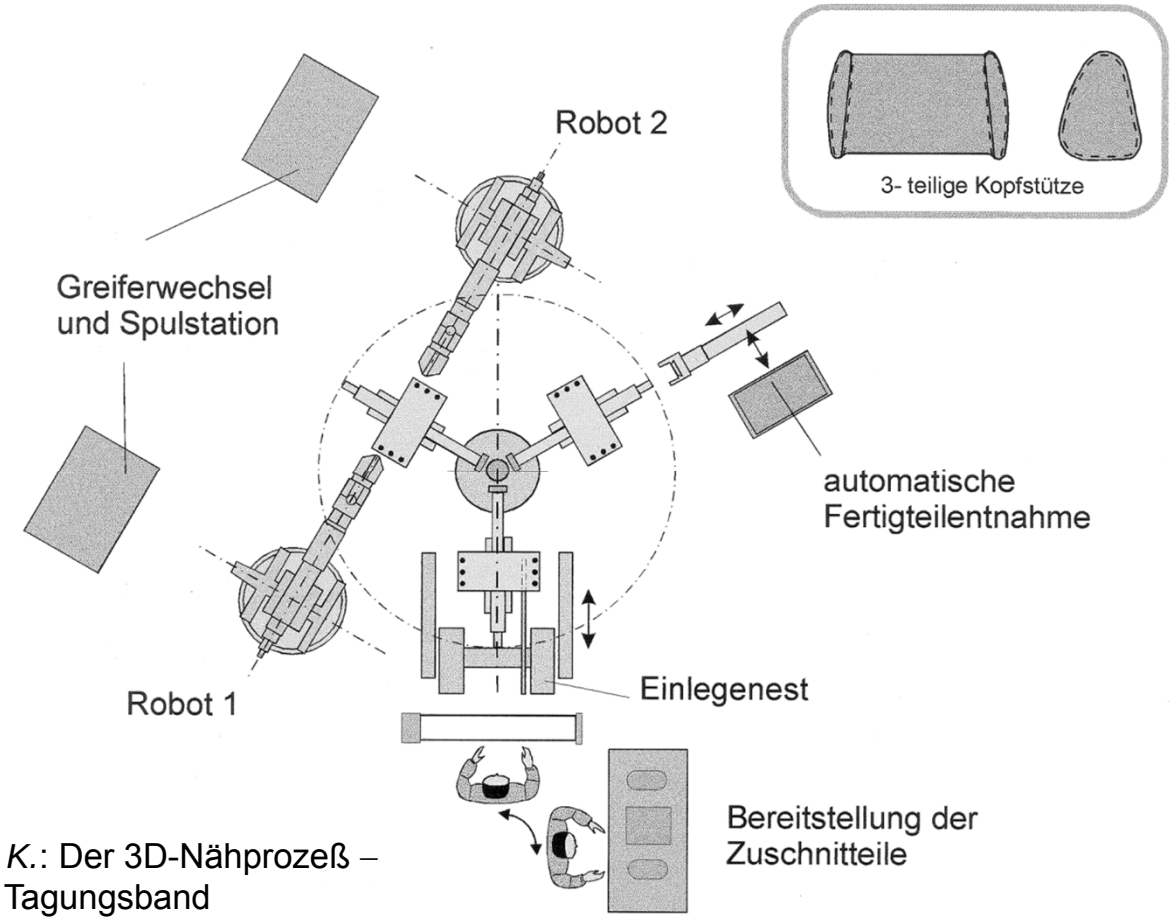
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3T

Flexible handling of work piece during textile manufacturing

Research focus: 1980-present

- New joining methods (e.g. one-side sewing systems)
- Implementation of robots for production



Source: *Händler, K.*: Der 3D-Nähprozeß – Eine Einführung. Tagungsband Fachgespräch im Verbundvorhaben „Integriertes 3D-Nähsystem“, Aachen 03.12.1996, Aachen 1996, S. 45 - 52

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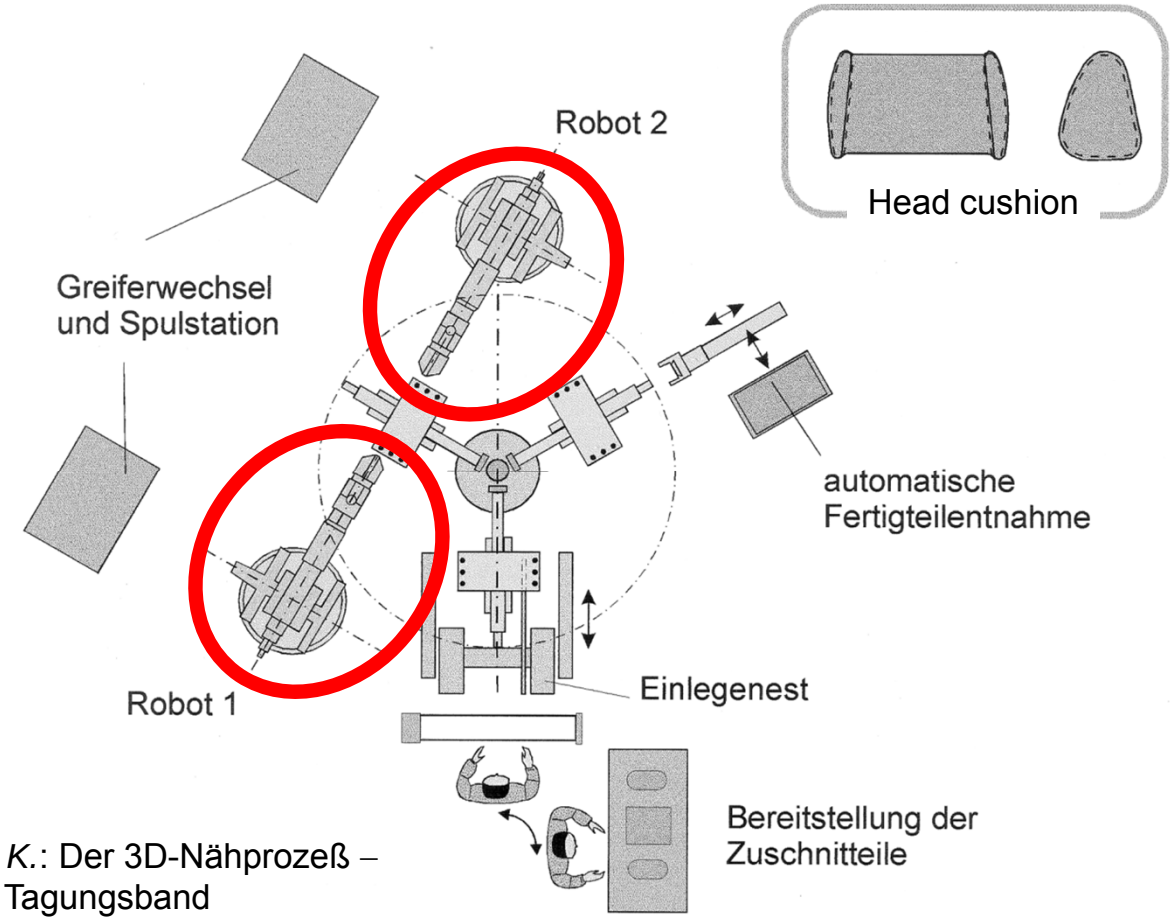
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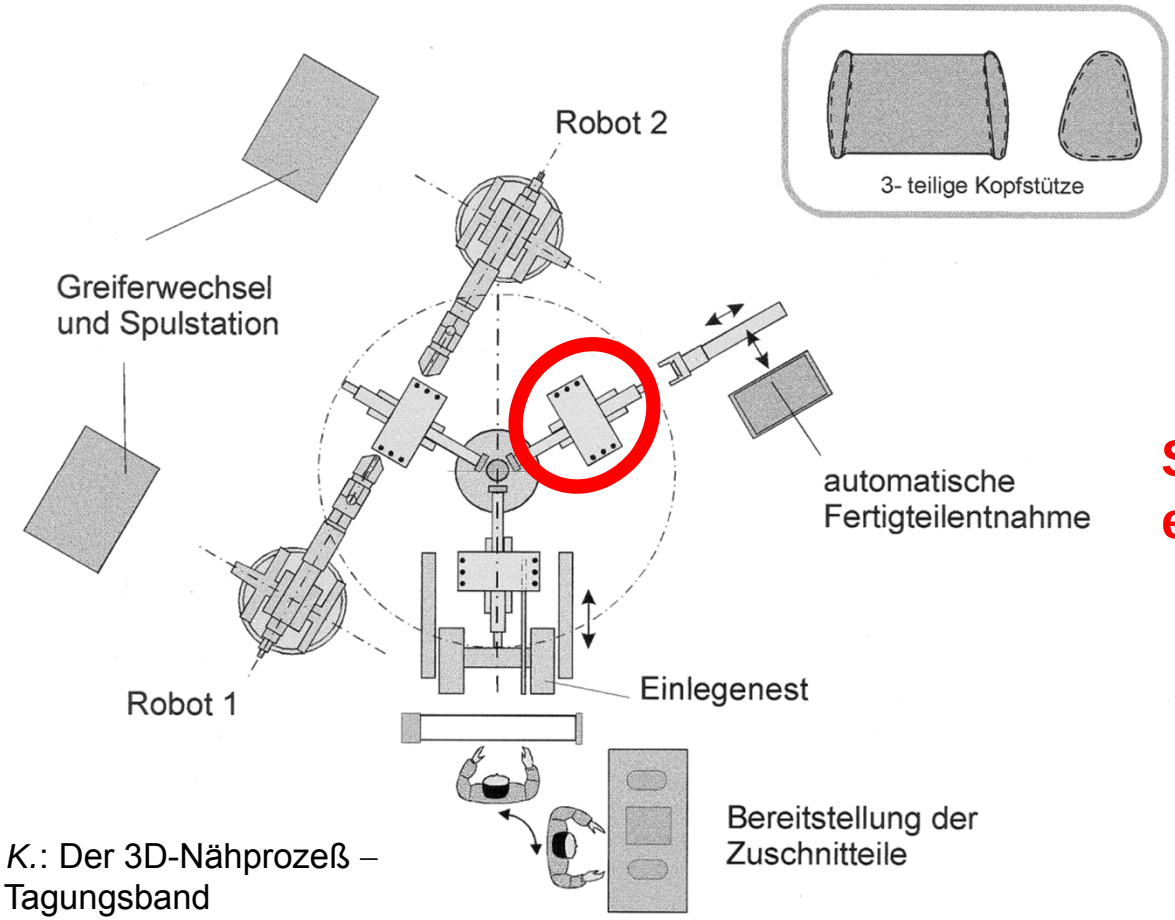
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Specific form for each product series!

Source: *Händler, K.*: Der 3D-Nähprozeß – Eine Einführung. Tagungsband Fachgespräch im Verbundvorhaben „Integriertes 3D-Nähsystem“, Aachen 03.12.1996, Aachen 1996, S. 45 - 52

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Existing systems:





Source: *KSL Keilmann Sondermaschinenbau GmbH*

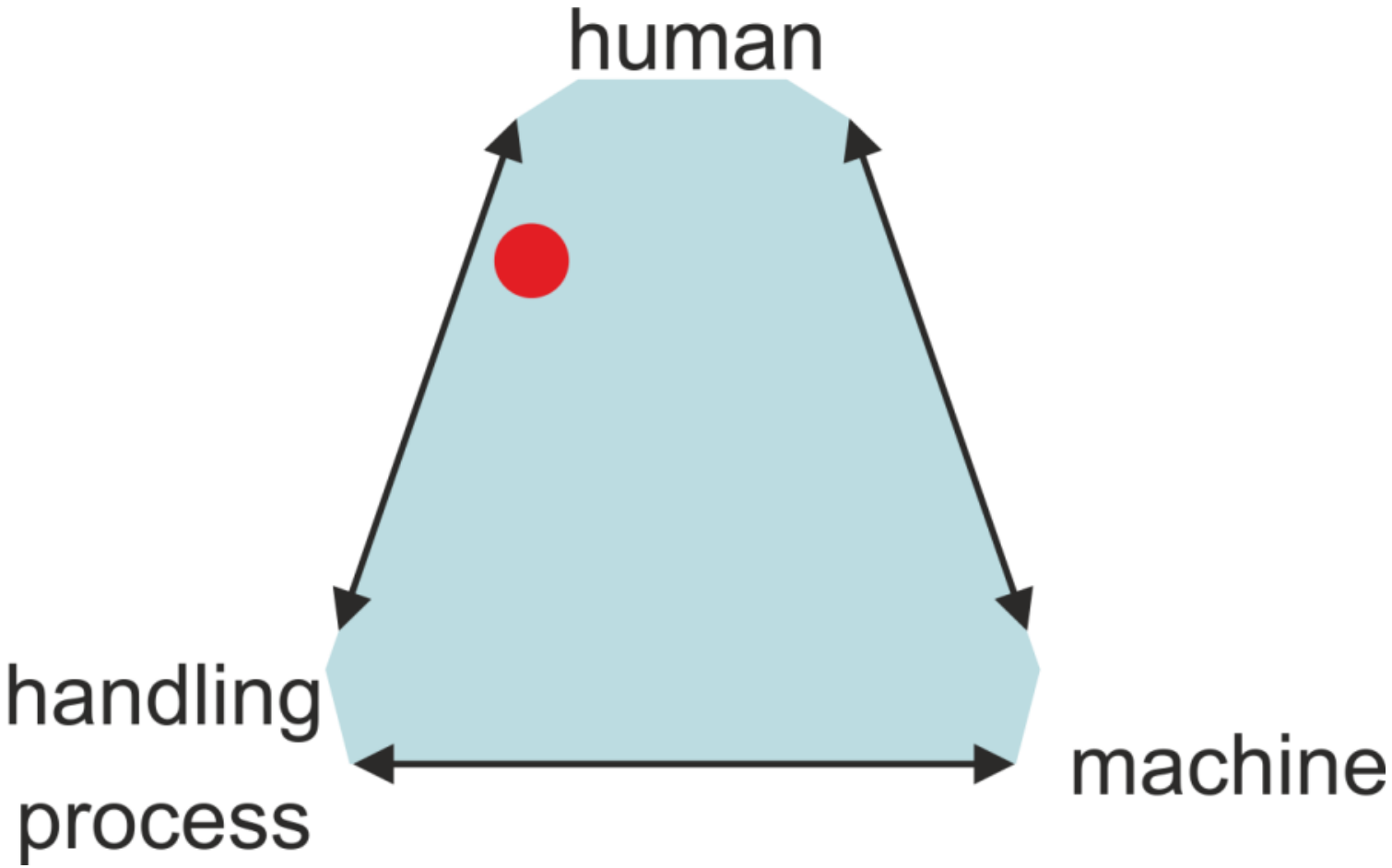
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Draft of approach:

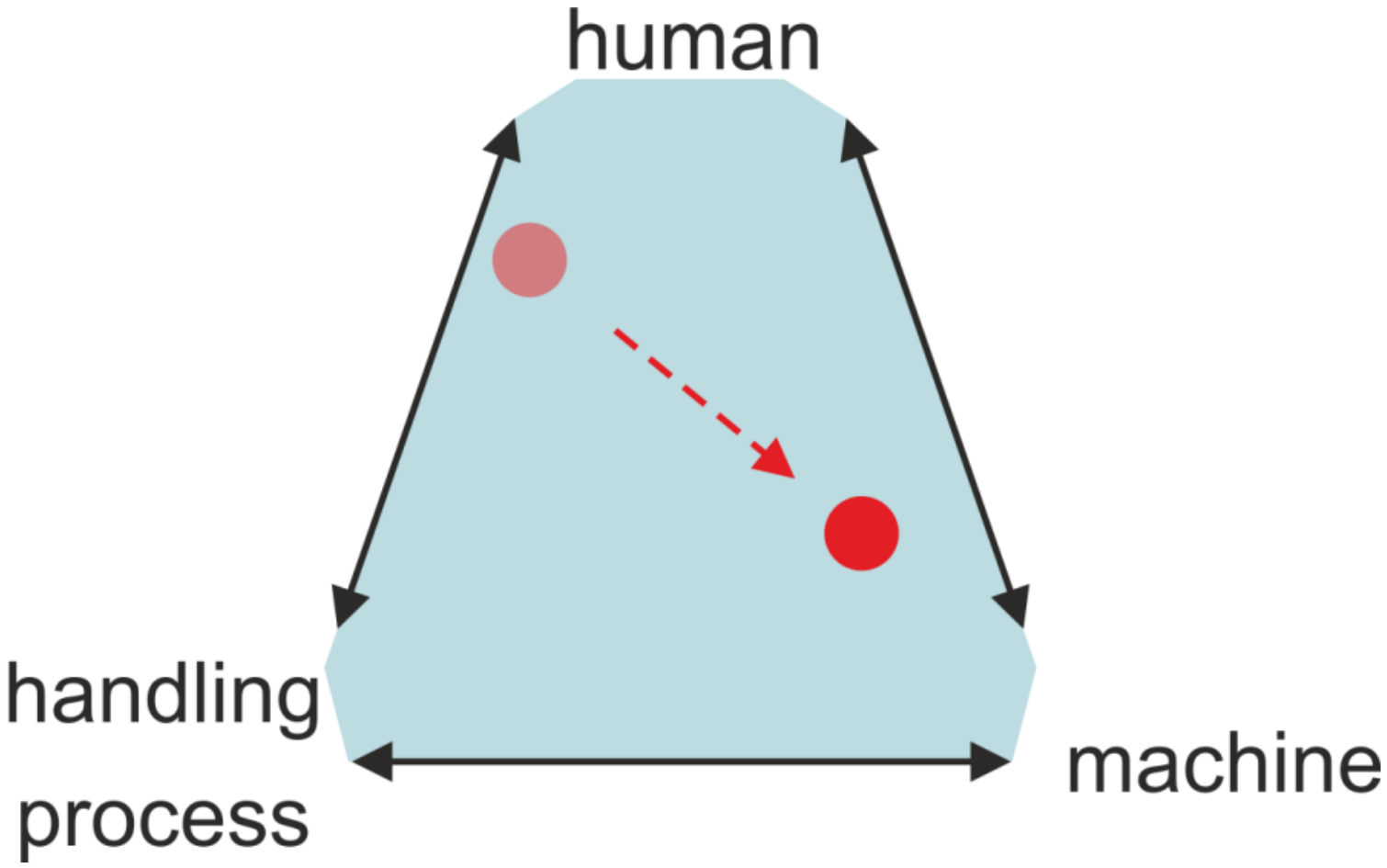
- Monitoring handling processes of operator (applied textile tension, forces, rotation etc.)
- Simulation of textile handling (movement)
- Development of handling device
- Development of closed loop control system (sensors and control system)
- Development of learning/adapting machine program
- Test run in industry
- Human ↔ machine interaction for production process (ergonomics)

All other ideas welcome!

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Flexible handling of work piece during textile manufacturing

Questions to answered

- Suitable for:
  - FoF 14 – 2015: Integrated design and management of production machinery and processes
    - Model based approach
    - Simulation, algorithm
    - Production accuracy/quality
    - System adaptability

  or

  - FoF 12 – 2015: Industrial technologies for advanced joining and assembly processes of multi-materials
    - Hybrid joints
    - non-destructive inspections
    - Maximum performance of joints

Contact

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