

## 20. Engineering human performance with cyber-human technology



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Cyber-human technologies such as VR/AR have the potential to significantly improve human performance in industry. But what works, and what does not?



**Figure 1:** Picture from the world's largest experiment with haptic force feedback gloves at the IfM

### Deliverables

- Pilot experiment on assembly training effectiveness of Immersive VR (IVR) and Desktop VR (DVR)
- Comparing new data (n = ~94; 3 TG) on differences between a 3D and 2D VR assembly training of the same design
- Results show that
  - participants performed significantly better ( $p \leq 0.0001$ ) in the real-world assembly task compared to its desktop simulation
  - measured instructional efficiencies and affective learning outcomes are different for most IVR and DVR pairs ( $p < 0.05$ )
  - participants trained in DVR performed significantly better in the knowledge retention test ( $p < 0.0005$ ).

### Aims

- collaborate with industry
- identify suitable technologies and industrial work contexts for this project
- make progress with the application of cyber-human technology to industrial use cases

### Approach

- pilot innovative approaches with VR/AR and related technologies
- design and run an experiment to test performance effects

### Future research

- due to the COVID-19 pandemic, we were not able to run all planned experiments. We would therefore like to continue with the project in 2020/21.
- Particular attention will be paid to low-cost and scalable Immersive VR (IVR) and Desktop VR (DVR) solutions
- If you are interested in joining this research project please contact Thomas Bohné, Head of the Cyber-Human Lab.

