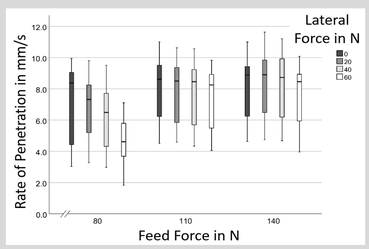
Karlsruhe Institute of Technology

IPEK
Institute of Product Engineering
at Karlsruhe Institute of Technology

Research Group: Human-Machine Systems (HMS)

VISION

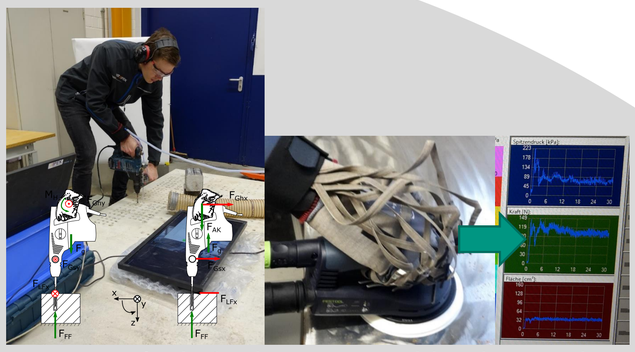
We analyze humans in their physical and informational interaction with technical systems based on **valid measurands**, represent them in **human models**, and integrate them into the **product development process** of human-machine systems.



Relationship between real user behavior and the abrasion/ the productivity of a technical system

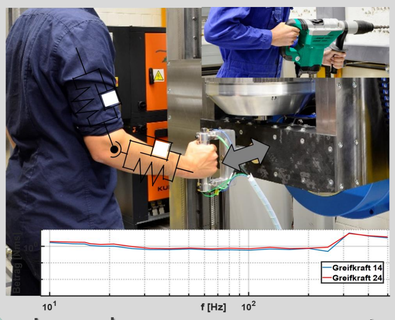
Development processes for intelligent user support

Tools for disruptive design changes for the reduction of the user stress

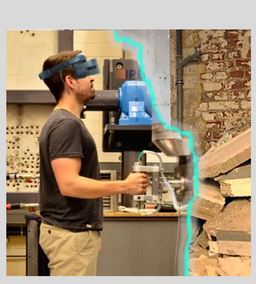


Force analysis for human-machine interaction

Biomechanical measurands to classify user expertise



Impedance measurement



Identification of influences on the vibration exposure

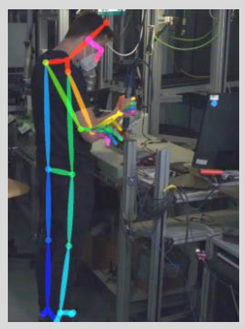
Mixed reality environments for early validation of human-machine systems

Integration into the development process

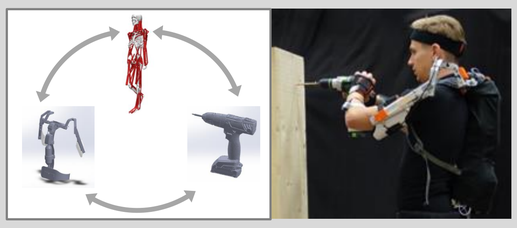
Analysis of human-machine-interaction

Representation in human models

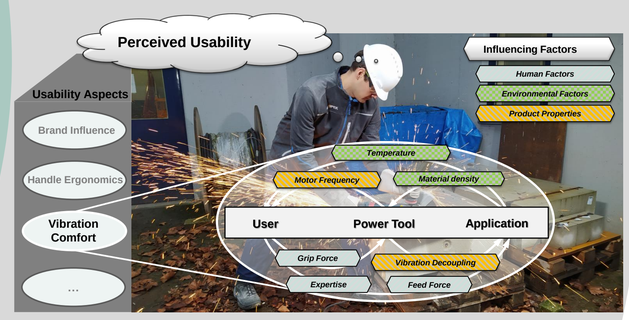
Dust exposure measurement



Markerless human-motion-capturing



Hybrid simulation models for user support systems such as exoskeletons

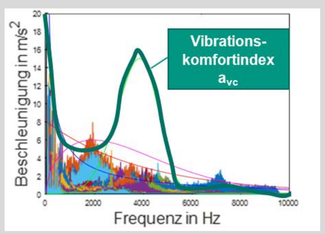


USE process for objective usability studies

Design guidelines for optimized handle design

Acceptance studies for human-machine symbiosis

Models of user forces and motions for automated robot test benches

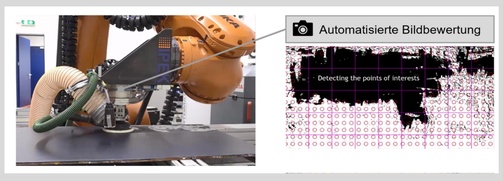


Perception models of vibration comfort

Mechanical models for the hand-arm vibration

Musculoskeletal models for user load assessment

Profiles for the user classification with biomechanical measurands



Perception models for the working results