

Human-Systems Integration for Future of Work

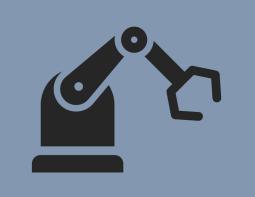
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Human-Systems Integration

Across Applications



Industry 4.0 increased AI, sensors, robots' capabilities and fear of worker displacement



Exoskeletons

Pertinent Human Factors

Considerations

We need Human-centered Automation/Al

Technology

Repeatability Endurance Computational Capacity Strength Uniformity

Human

Flexibility Improvisation Creative Decision Making Situation Awareness Sensing Capabilities

Poor Under Uncertainty Costly Hazardous

Human Error Slower Speed Fatigue Motivation

Collaboration can mitigate weakness or enhance strengths

INTEGRATE human & systems rather than **REPLACE** humans





Semi-Autonomous Vehicles

Collaborative Robots

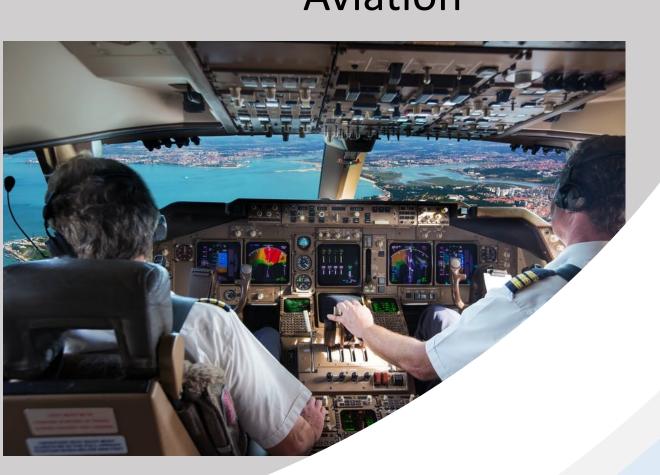


Drones



Artificial Intelligence





Aviation



- ↓ Safety
- 1 Liability
- User Satisfaction



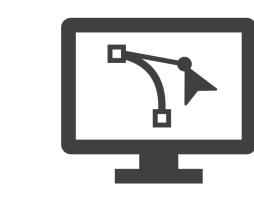
Augmented or Virtual Reality Support



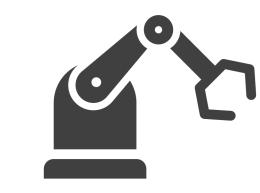
Training



Real-Time Monitoring



Adaptive Visual Displays & Alerts

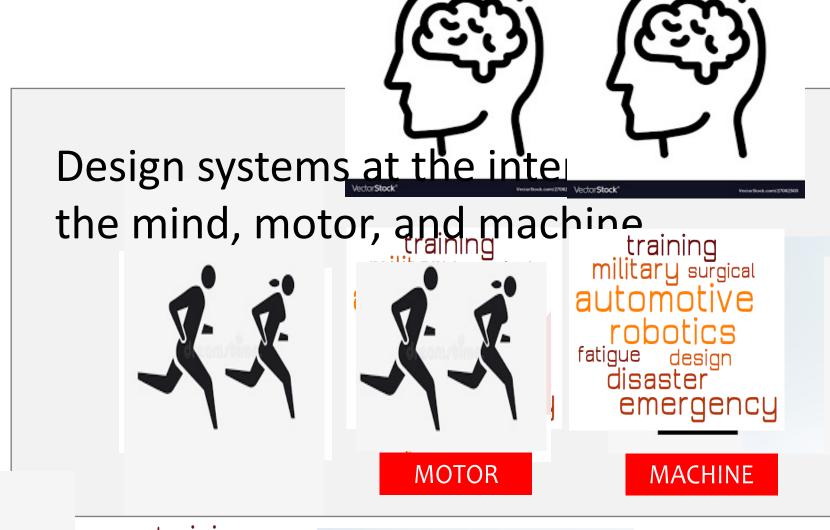


Adaptive Task Allocations



Improved Human-System Fluency

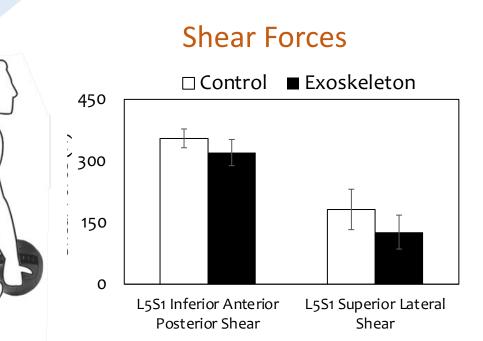
Support & Augment Human Capabilities

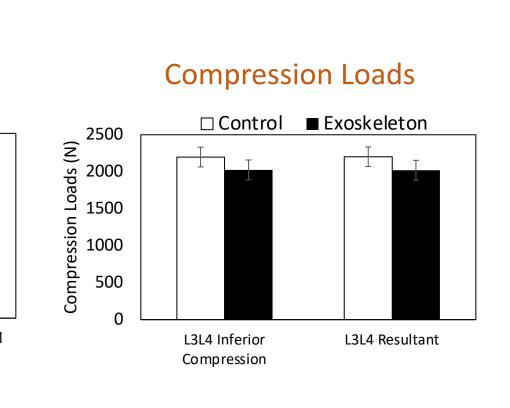


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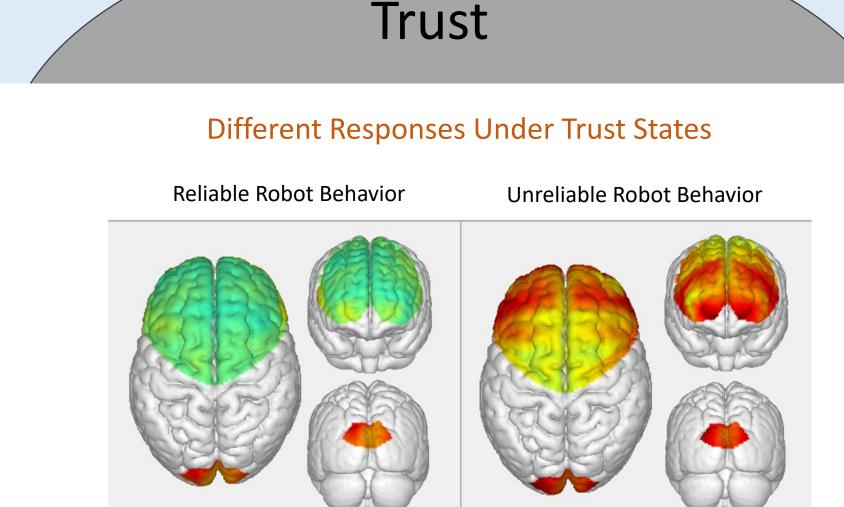
Ergonomics



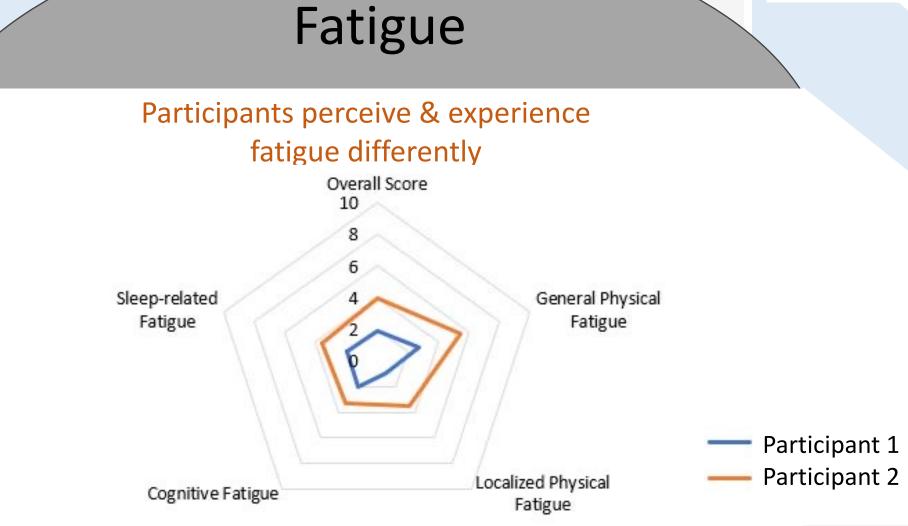




Workload



Ignoring human factors



The National Academies of SCIENCES ENGINEERING MEDICINE National Institute for Occupational Safety and Health

