Background and motivation
Over 190 million persons worldwide are living and suffering from severe disabilities, which limits their ability to seamlessly interact with daily-use devices and engage in social communication and activities. Eye-gaze interaction is a common control mode for people with paralysis. Mobile robotic telepresence systems are widely used to promote social interaction between geographically dispersed people. We aim to apply gaze-interaction to such systems, in order to improve social communication of patients with motor disabilities. However, it is still unclear how gaze-interaction within these systems impacts users. Moreover, potential improvement methods need to be found.

Research questions and methodology

Question 1: What kinds of impacts does gaze control have?

Question 2: how to improve gaze-controlled user interface

User-centered design: improvement of gaze-interaction

Hands-free control in robot teleoperation
Plan, research, design, adapt, and measure

Question 3: What kinds of impacts does training of gaze control have?

Literature review

Hardware-in-the-loop Simulation
Simulation-based training
Robot-mediated communication
Communication quality

(Study 1)

Why to train
What to train
How to train

(Study 2)

Literature review

Task complexities
Situation awareness
Presence
Performance
Control methods
Positions
Displays
Workload
User experience

Expected Outcomes
This research is expected to contribute:
• insights about novel gaze-interaction to enable independent use and equal access of mobile telepresence for patients with motor disabilities;
• empirical evidence of the impacts of gaze interaction;
• empirical evidence of the impacts of training on improvements of gaze-controlled telepresence, and further the patients’ social communication.

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