How Observers Perceive Teleport Visualizations in Virtual Environments

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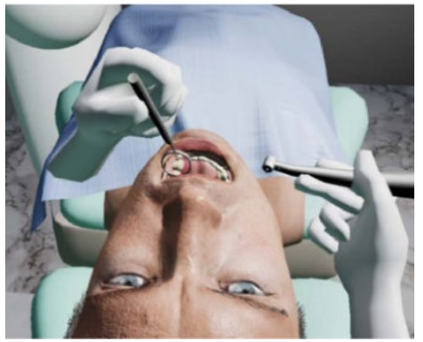

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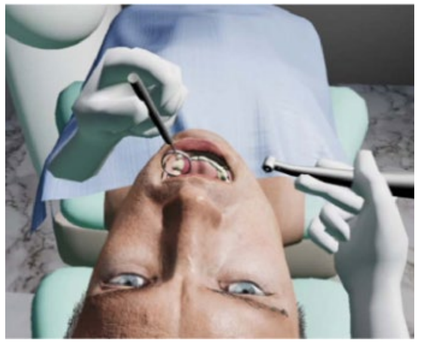

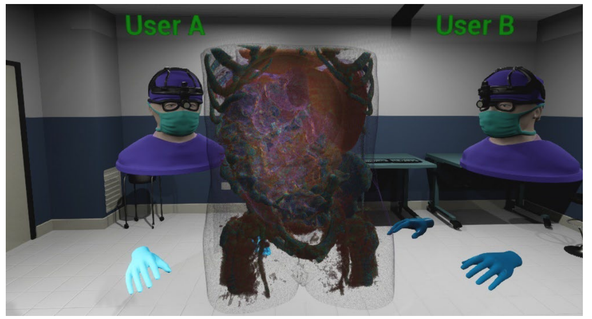

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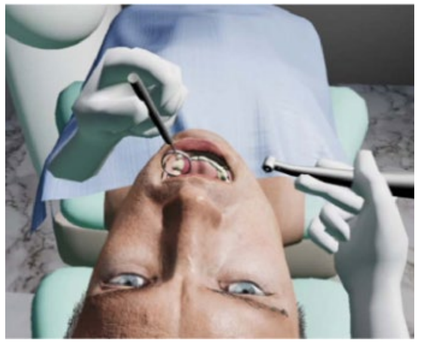

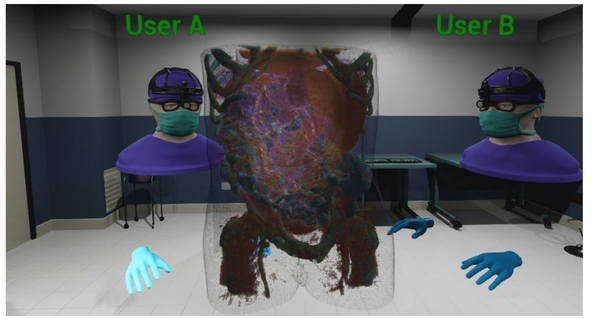

VR telepresence system [Dijkstra-Soudarissanane19]

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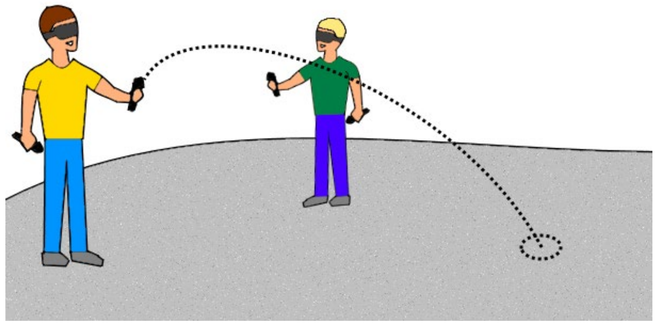
  - Produces least cybersickness, larger distances



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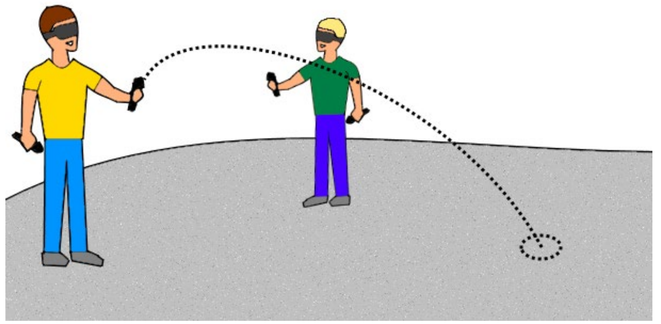

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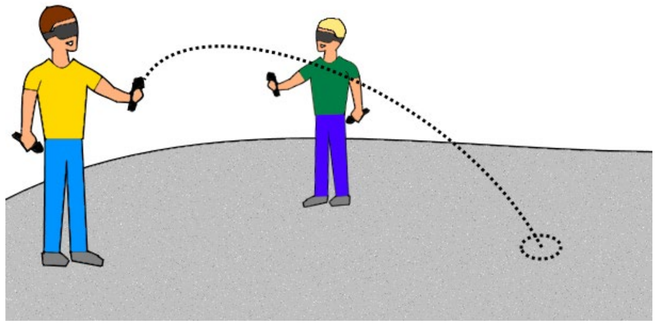

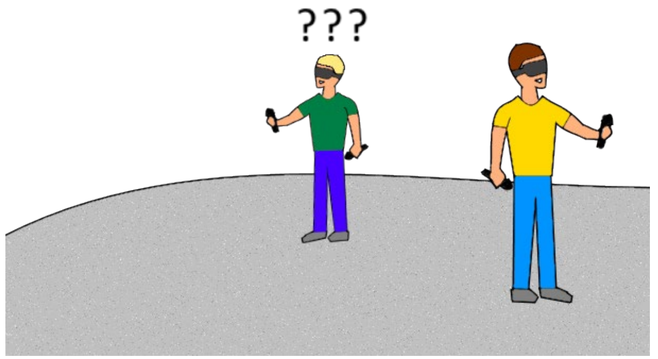

- May lead to confusion, loss of presence

Related Work

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    Evaluated spatial awareness, attractiveness, pragmatic/hedonic quality scores.

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    Novel, continuous visualizations performed best
    - Single teleportation scenario, no presence

Our Contributions

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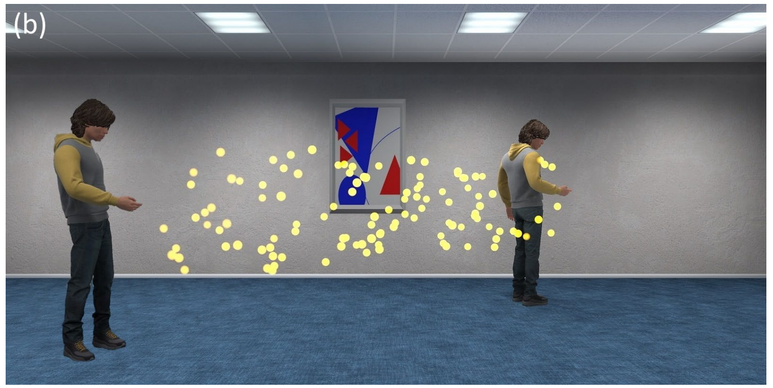
- Visualization guidelines

Visualizations

a) Standard/delayed teleport (P&CS/P&C)



b) Particle trace (PTrace)

c) Beam

d) Portal

e) Dash

f) Walking animation (Walk)

[Fischer, Jochens et al. SUI23]

Study Design and Setup

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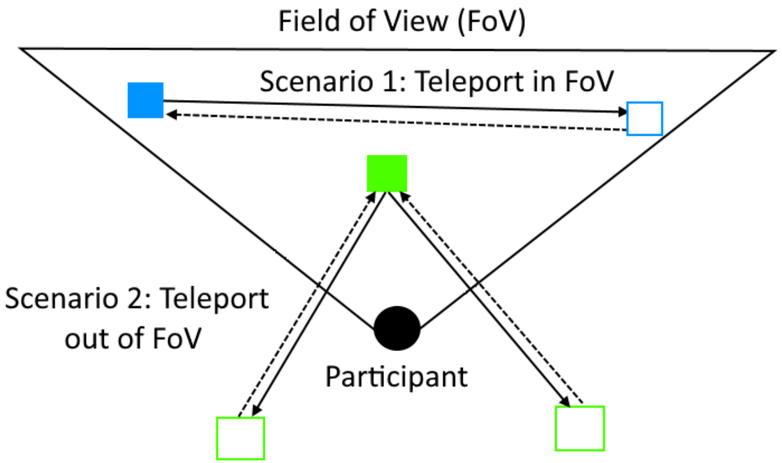

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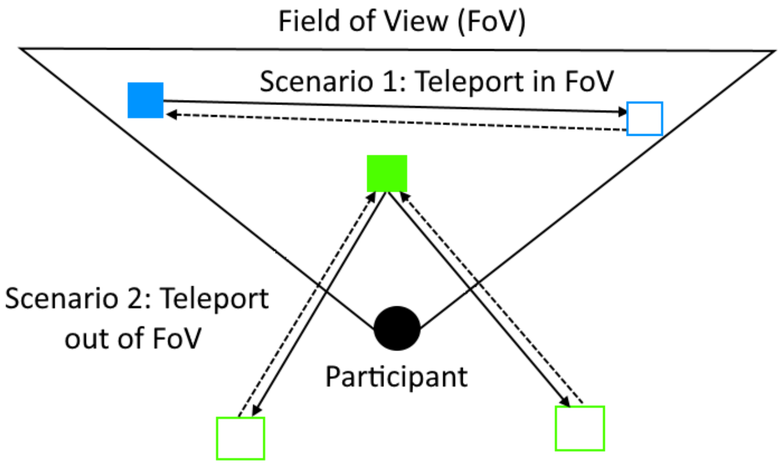
- Conditions: 2 (FOV) x 2 (speed) x 7 (visualizations)
- Task: Observe and track avatar



Measurements

- Social/spatial presence
- Spatial awareness

  (target anticipation, trackability)
- Confusion (plausibility, intuitiveness)
- User preference
- Speed scalability

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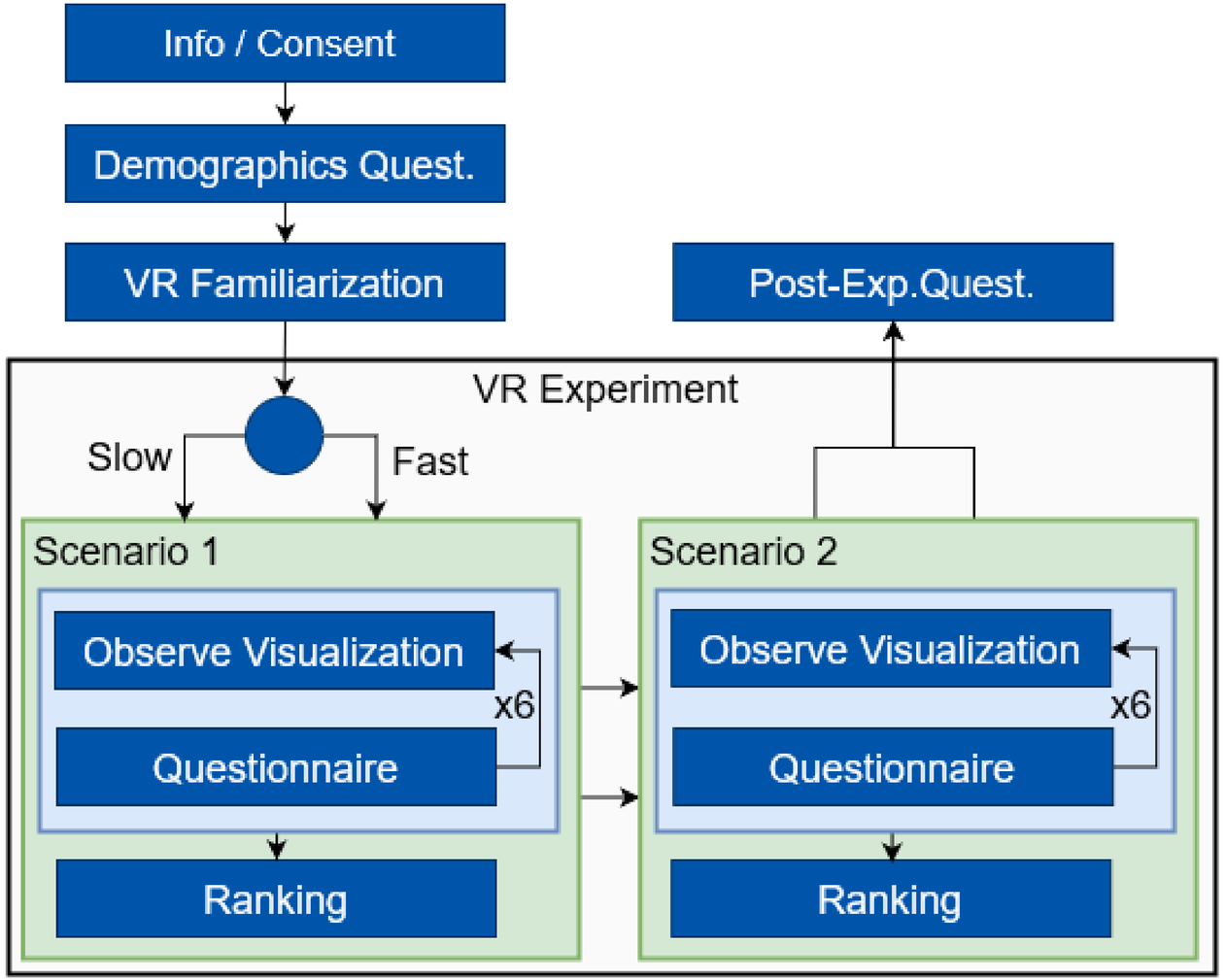
Questionnaires +
eye- and controller tracking

Procedure


Info / Consent
Demographics Quest.
VR Familiarization
Post-Exp.Quest.
VR Experiment
Slow
Fast
Scenario 1
Observe Visualization
x6
Questionnaire
Ranking
Scenario 2
Observe Visualization
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Results & Discussion

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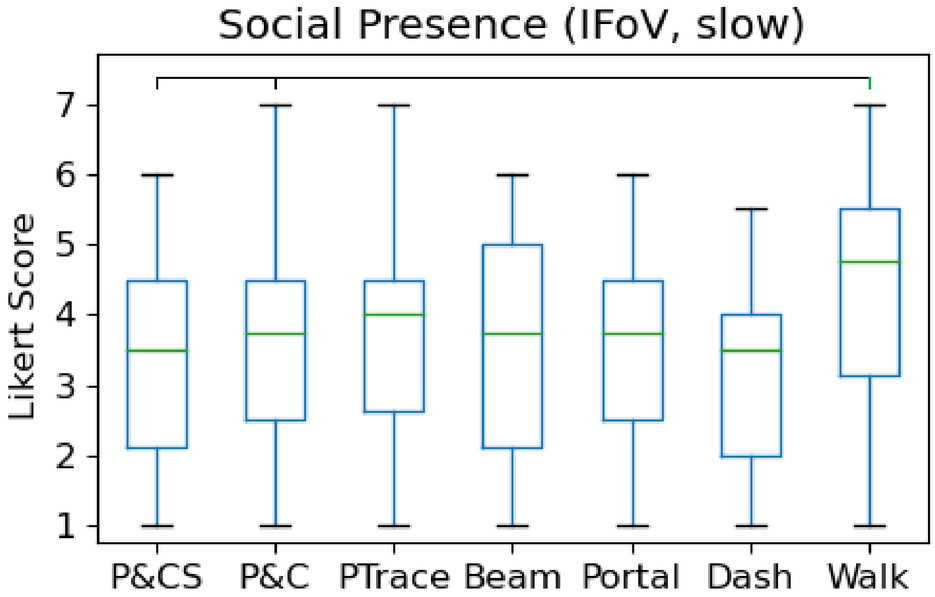

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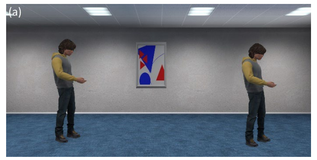

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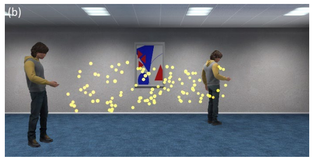
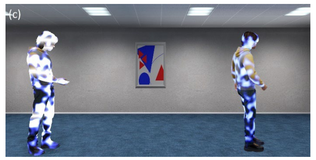


Beam



Portal

Dash

Walk

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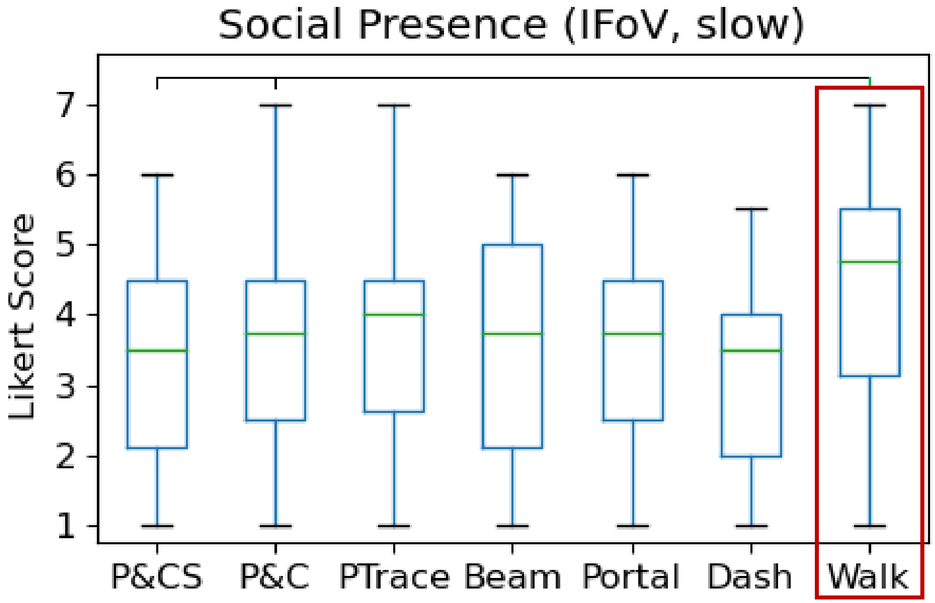

Walking has highest presence

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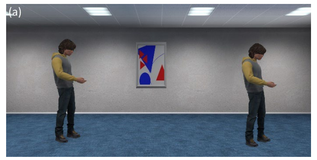

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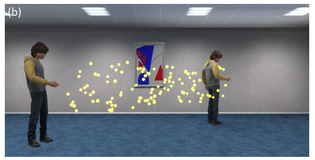

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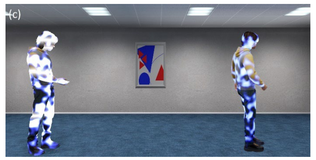

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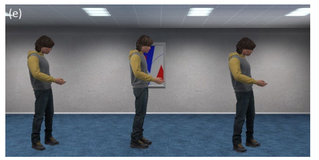

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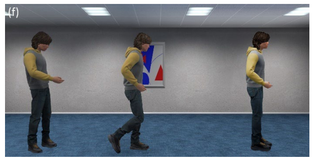

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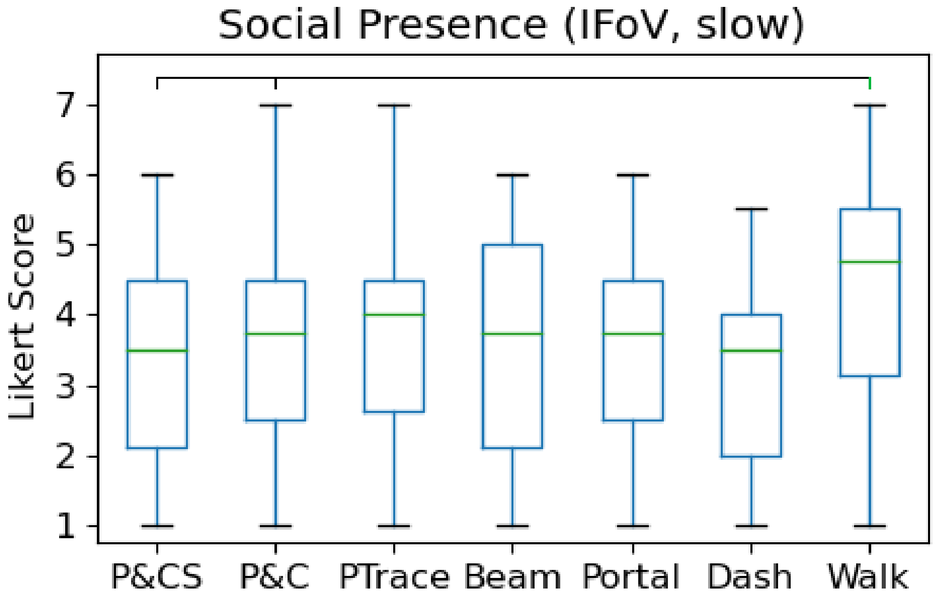

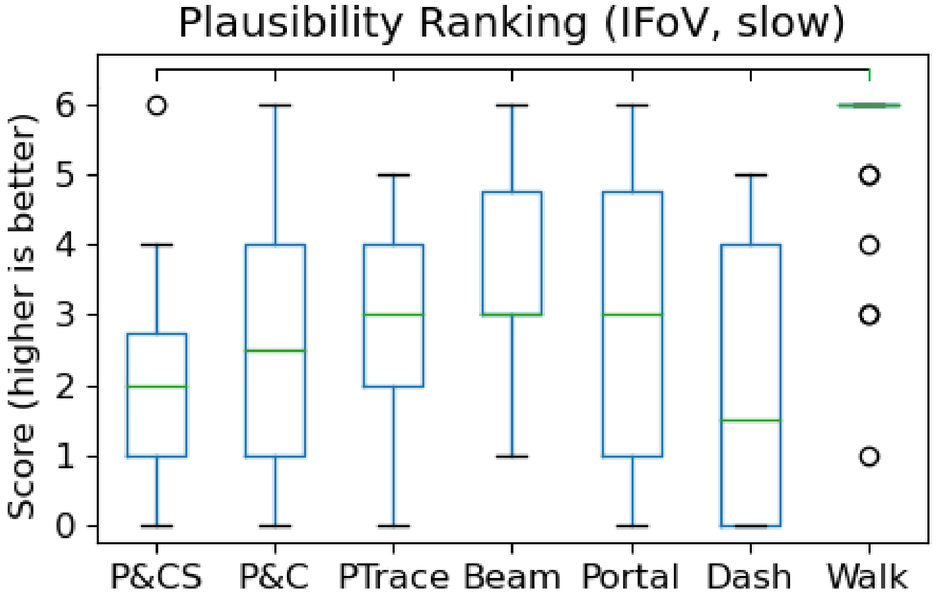

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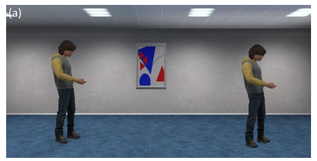

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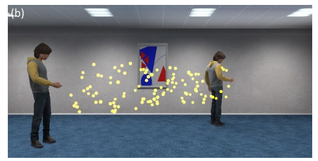

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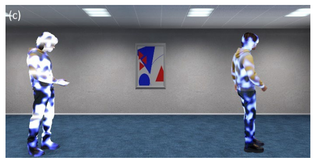

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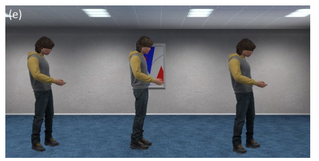

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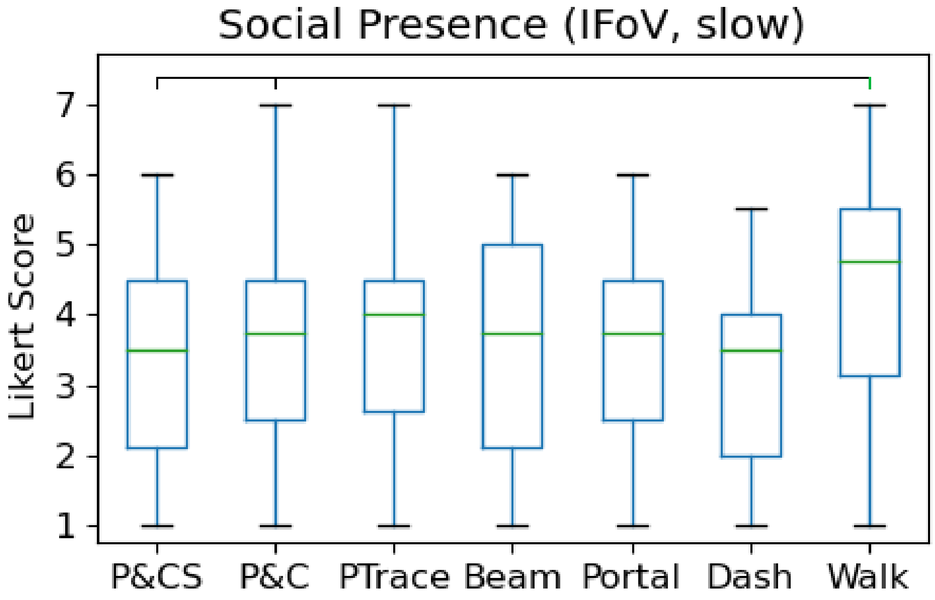

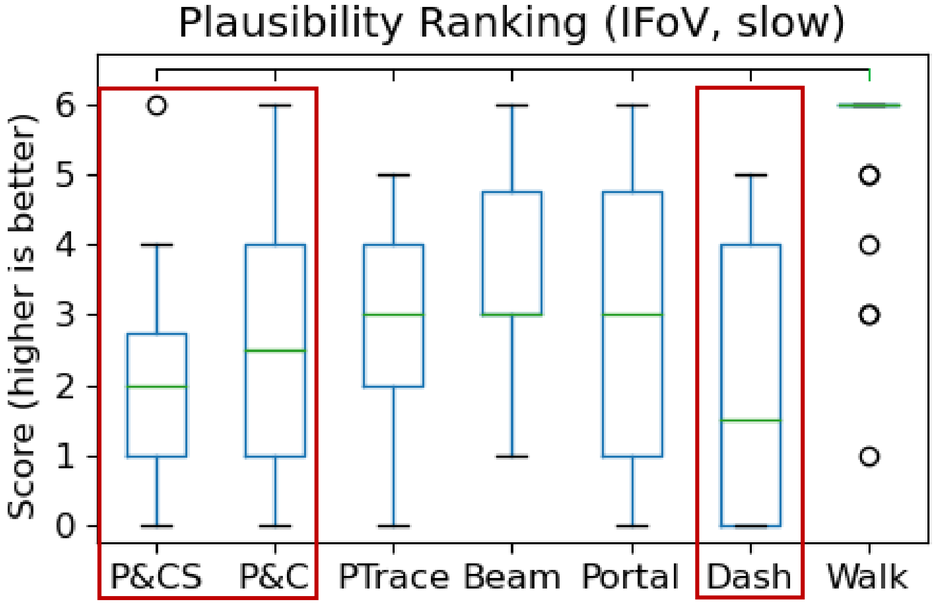

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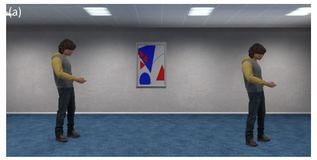

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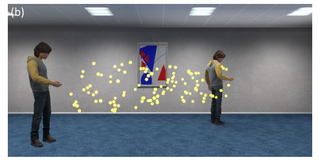

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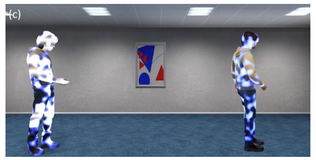

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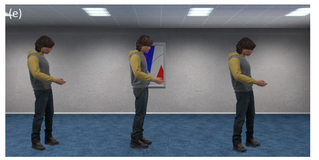

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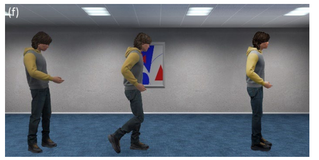

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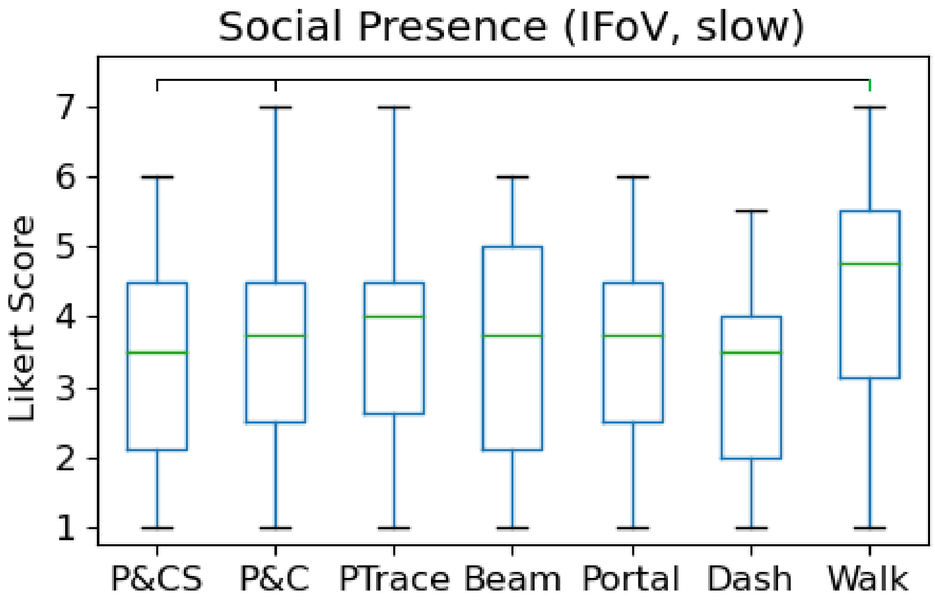

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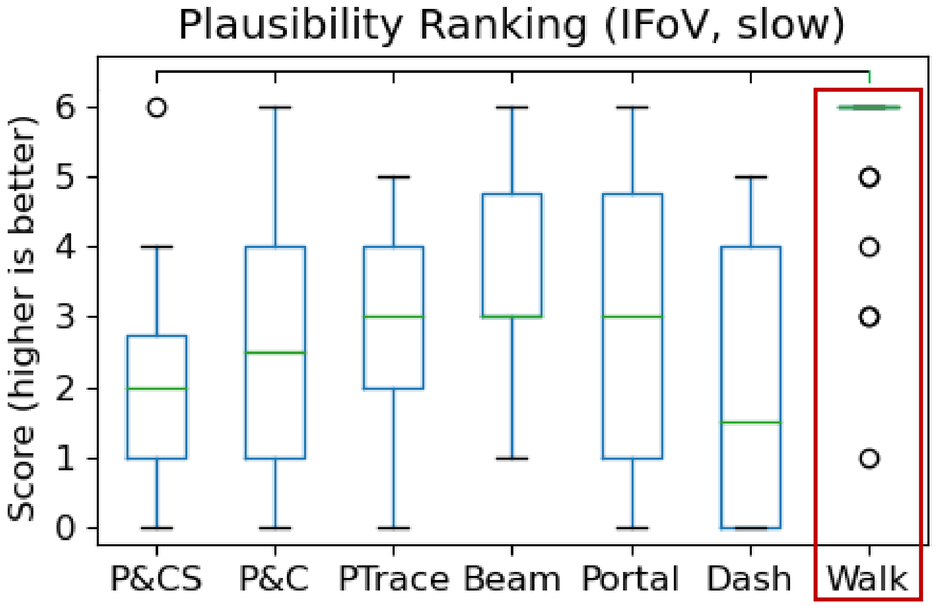
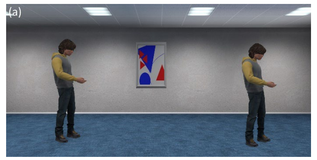


Walking reduces confusion the most

P&CS/P&C



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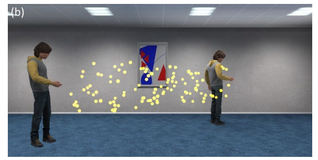

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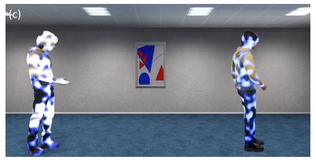

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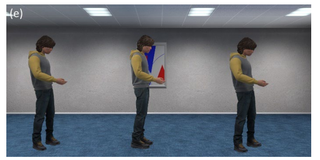

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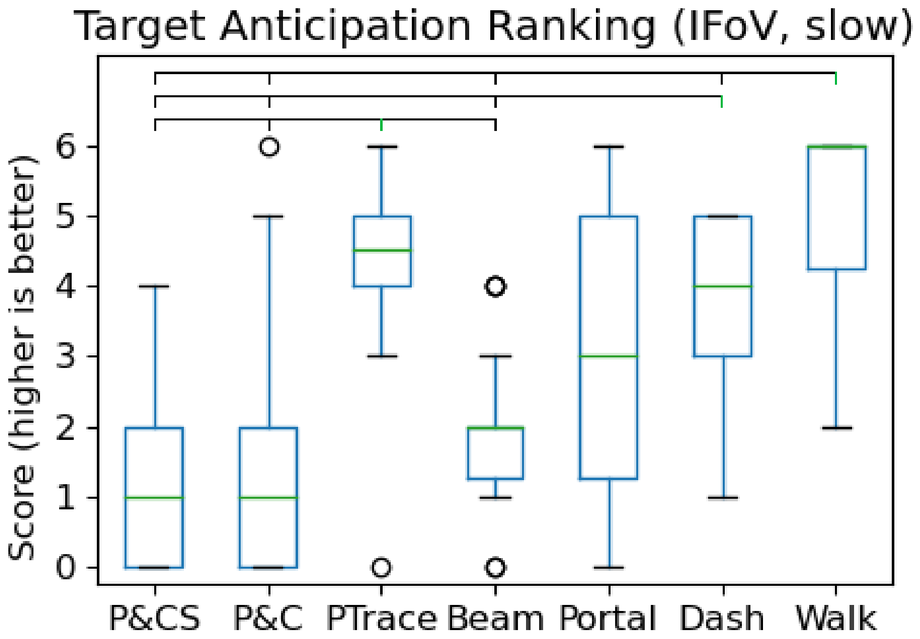

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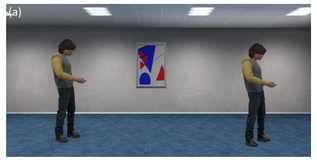

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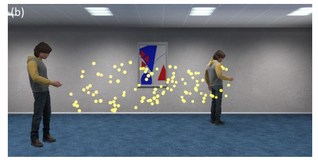
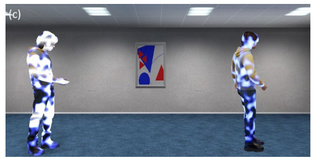


Beam



Portal

Dash

Walk

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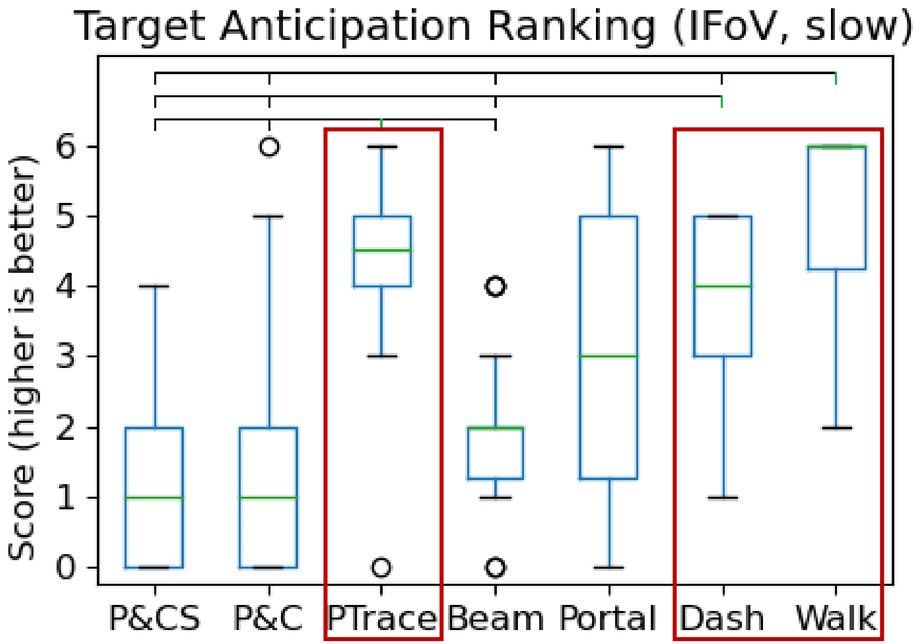

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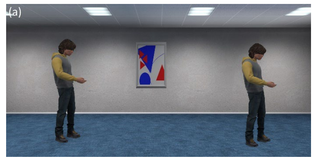

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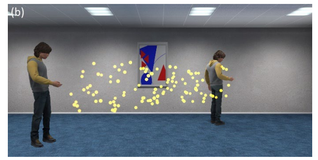

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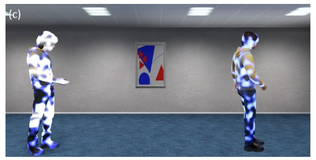

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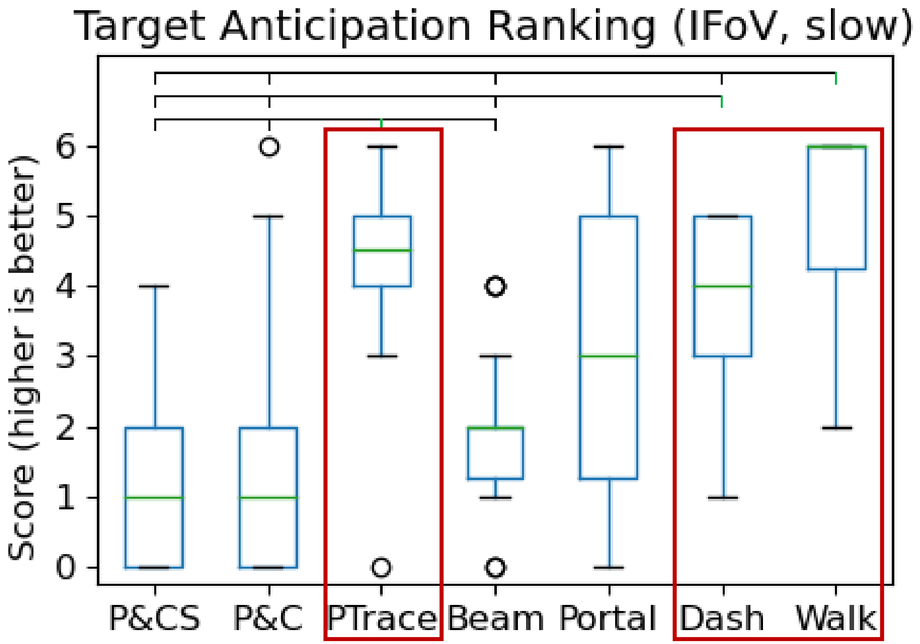

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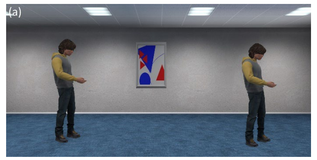

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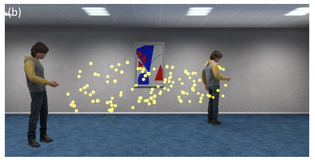

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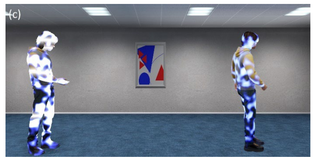

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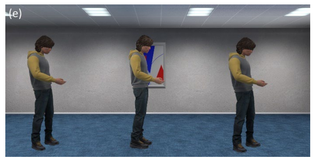

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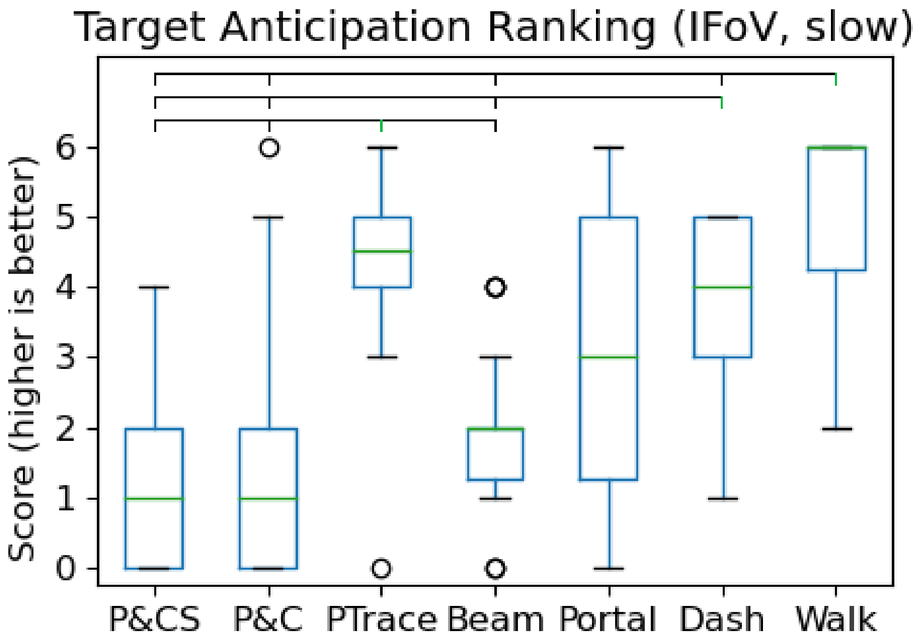

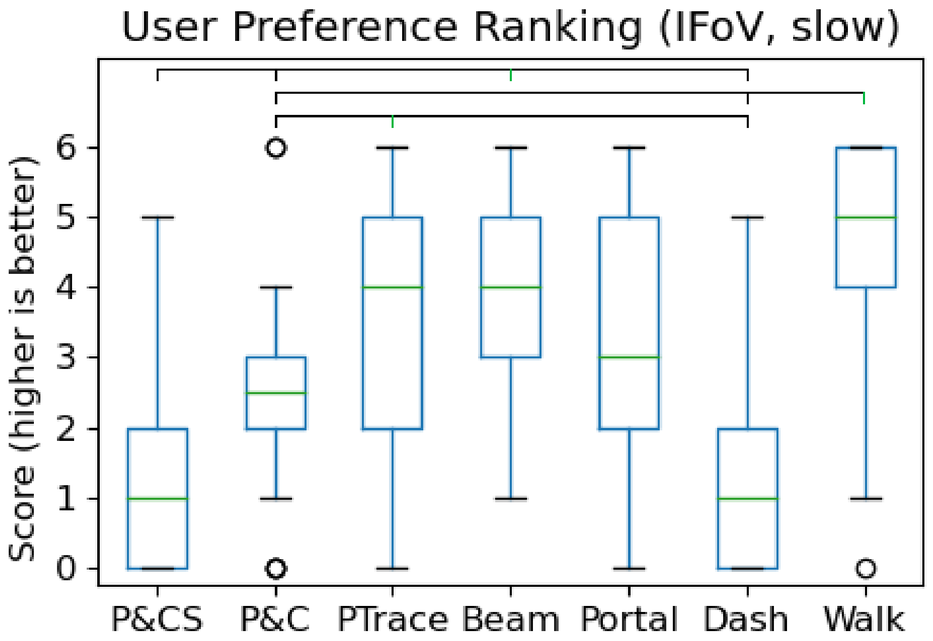

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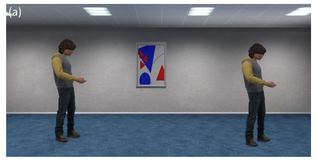

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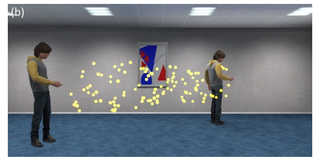

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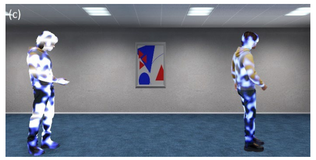

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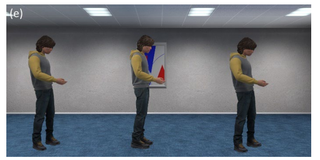

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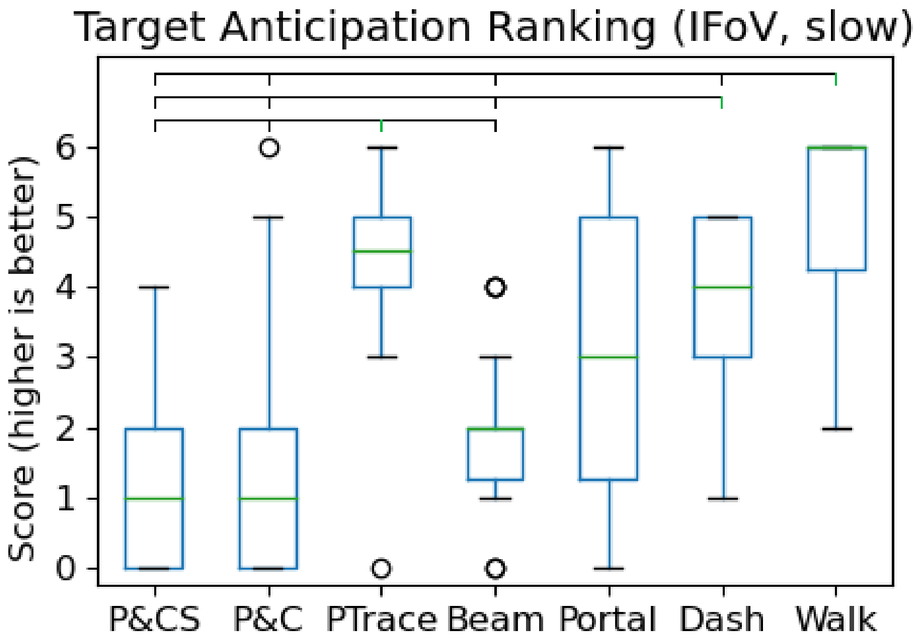

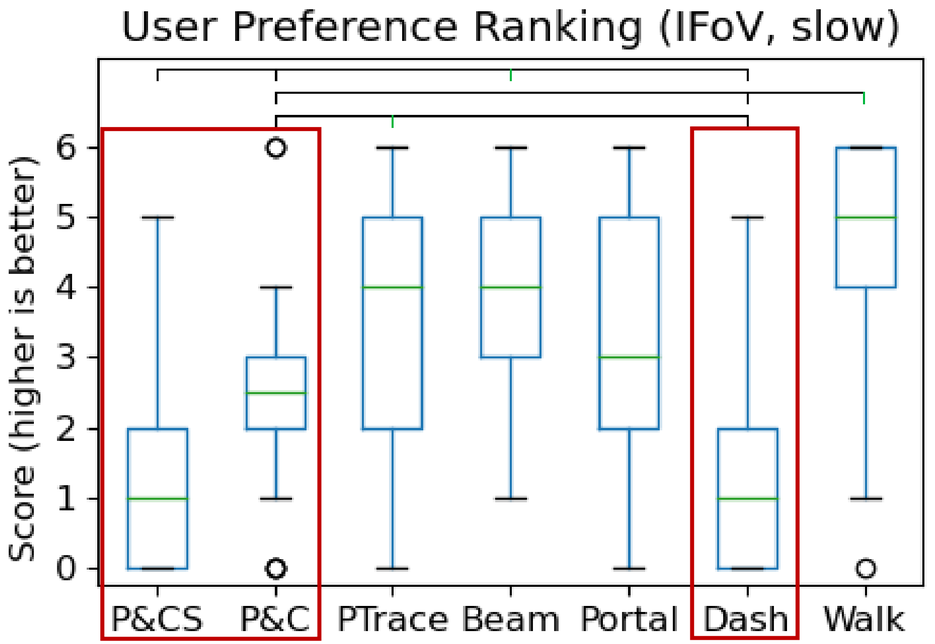

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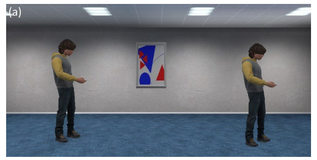

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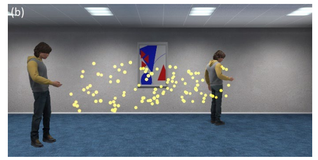

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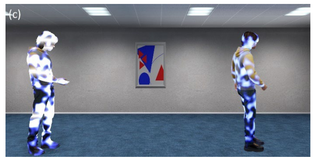

Portal

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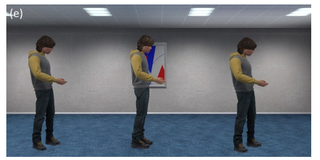

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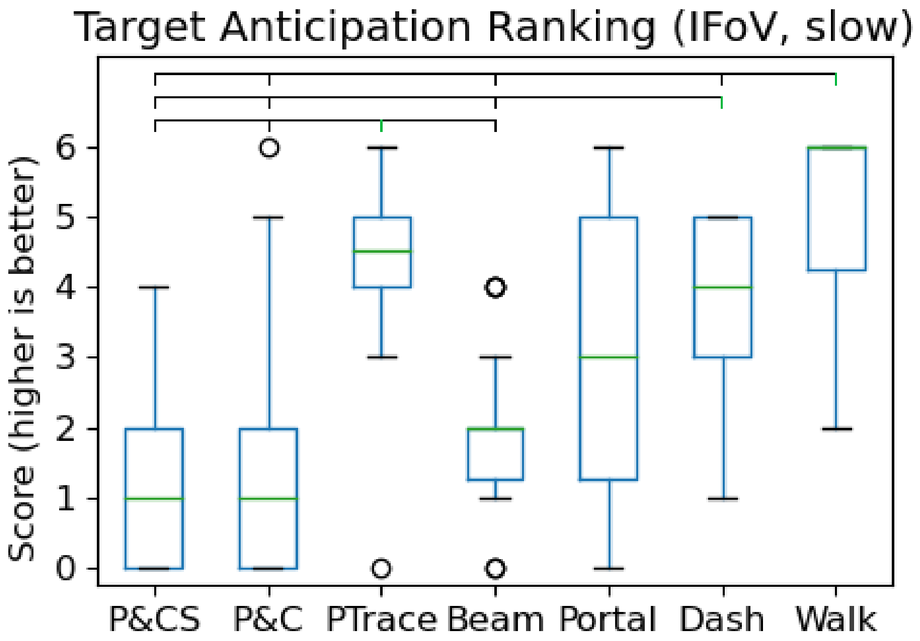

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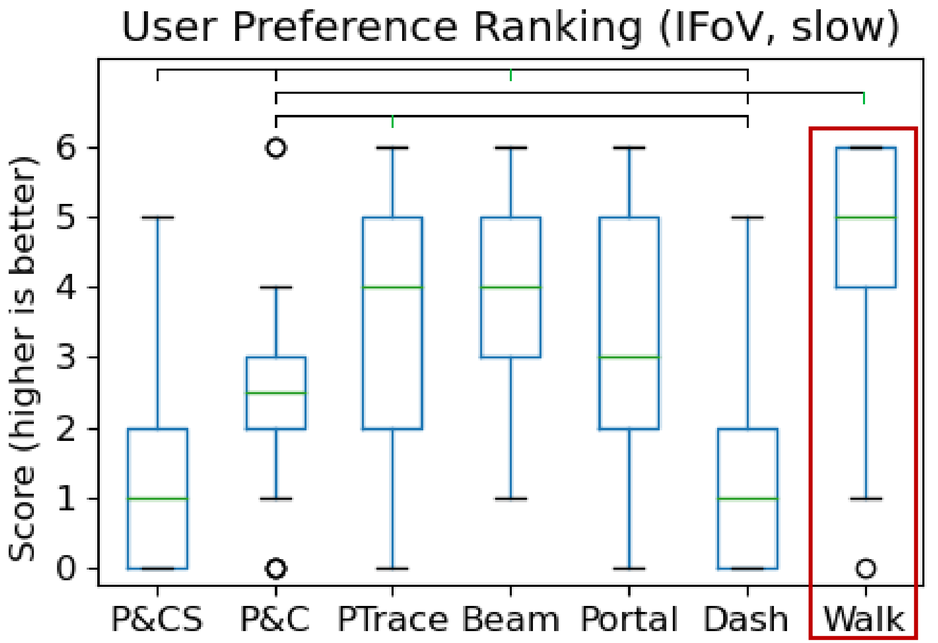
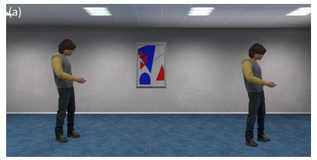


Teleport/dash is unpopular, walking is preferred

P&CS/P&C



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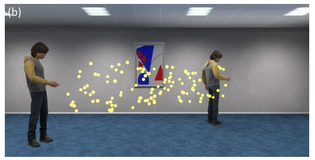

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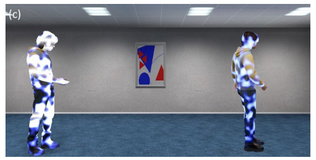

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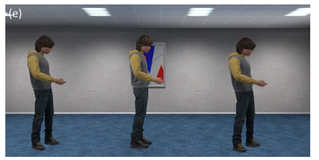

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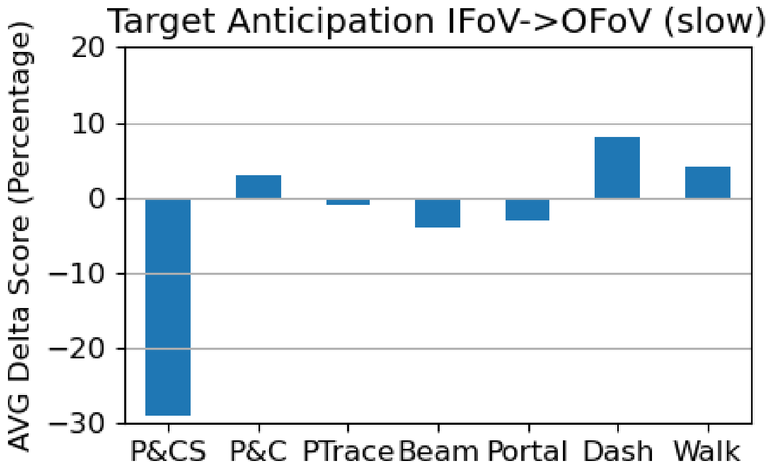

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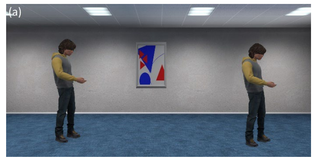

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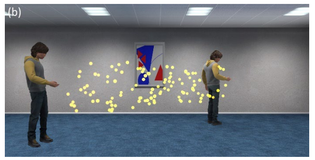

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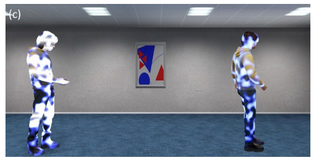

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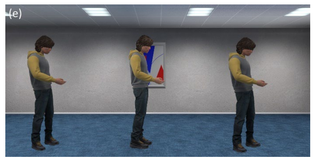

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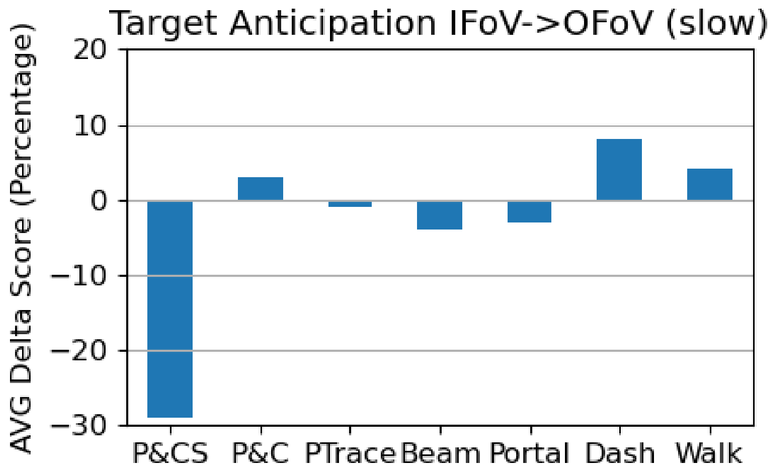

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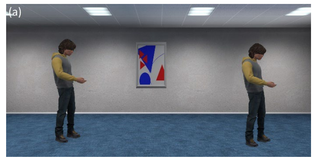

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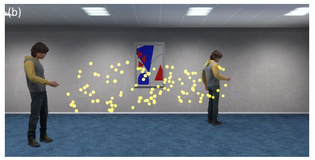

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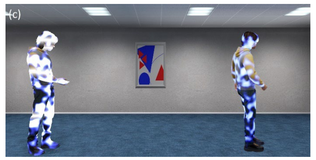

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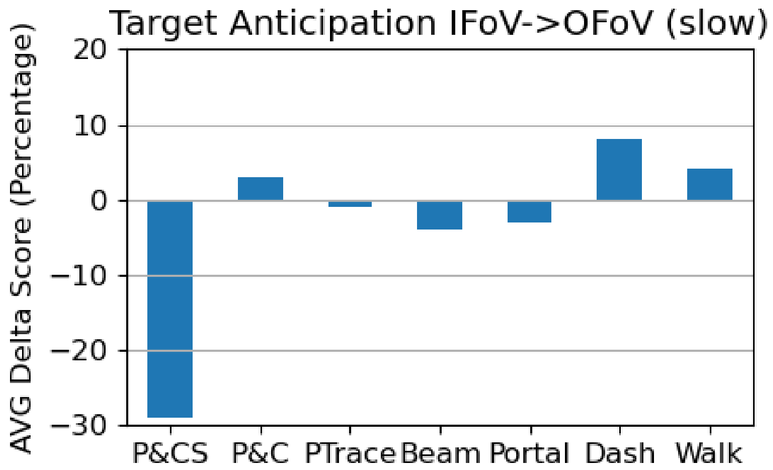
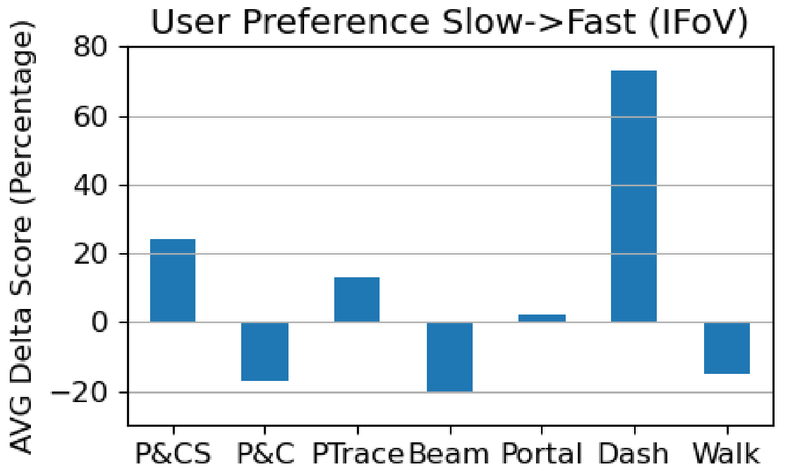


Slow vs. fast



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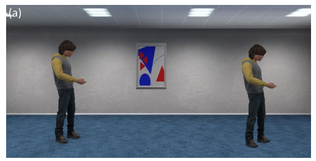

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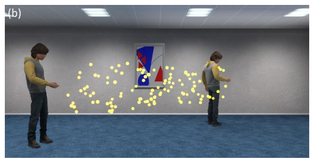

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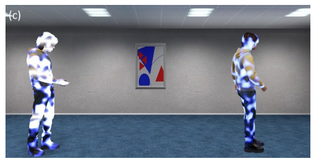

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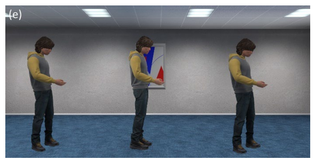
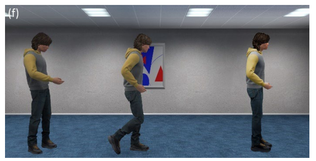


Walk



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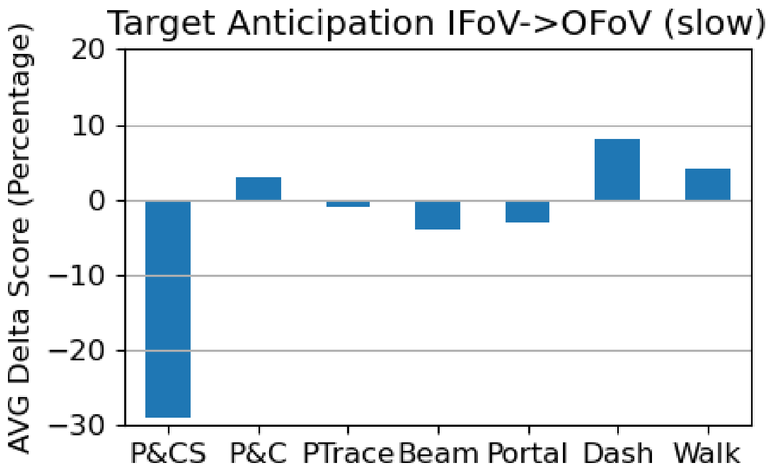

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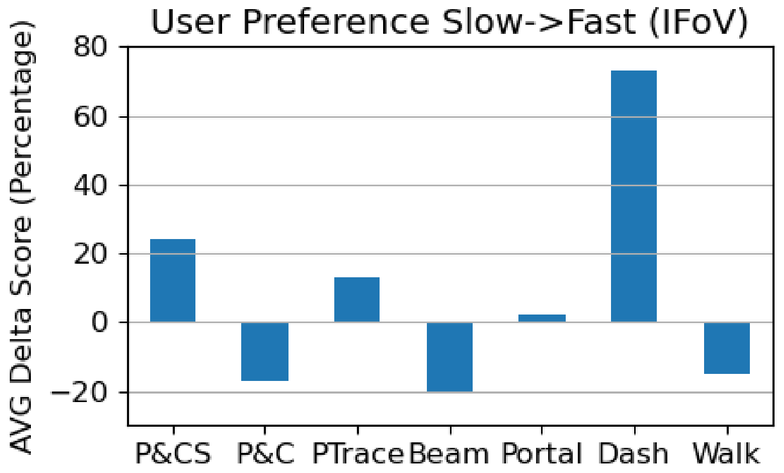
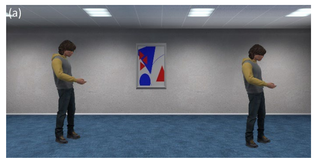


Bigger differences
Fast: visualizations more similar

P&CS/P&C



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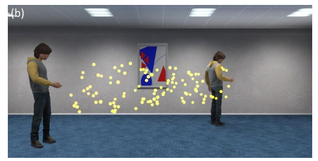

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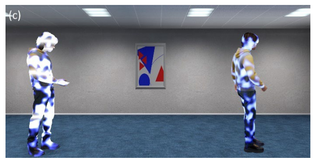

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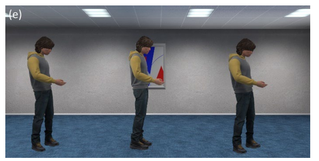

Walk

Guidelines

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  - ➢ Use them

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  - ➢ Use them
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  - ➢ Visualizations most important for longer teleport processes
- Continuous visualizations tend to perform better (spatial awareness)
  - ➢ General recommendation

Guidelines

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  - ➢ Use them
- Benefits decrease with speed
  - ➢ Visualizations most important for longer teleport processes
- Continuous visualizations tend to perform better (spatial awareness)
  - ➢ General recommendation
- Walking animation performed best overall
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- Particle trace best for faster speeds
  - ➢ Alternative recommendation

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- Evaluated various measures and conditions/cases
- Provided valuable insights and guidelines
- Visualizations can provide (significant) benefits
  - Confusion, spatial awareness, presence, preference
- Visualizations vary in performance
  - Walking animation and particle trace were best

Future Work

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- Collaborative tasks

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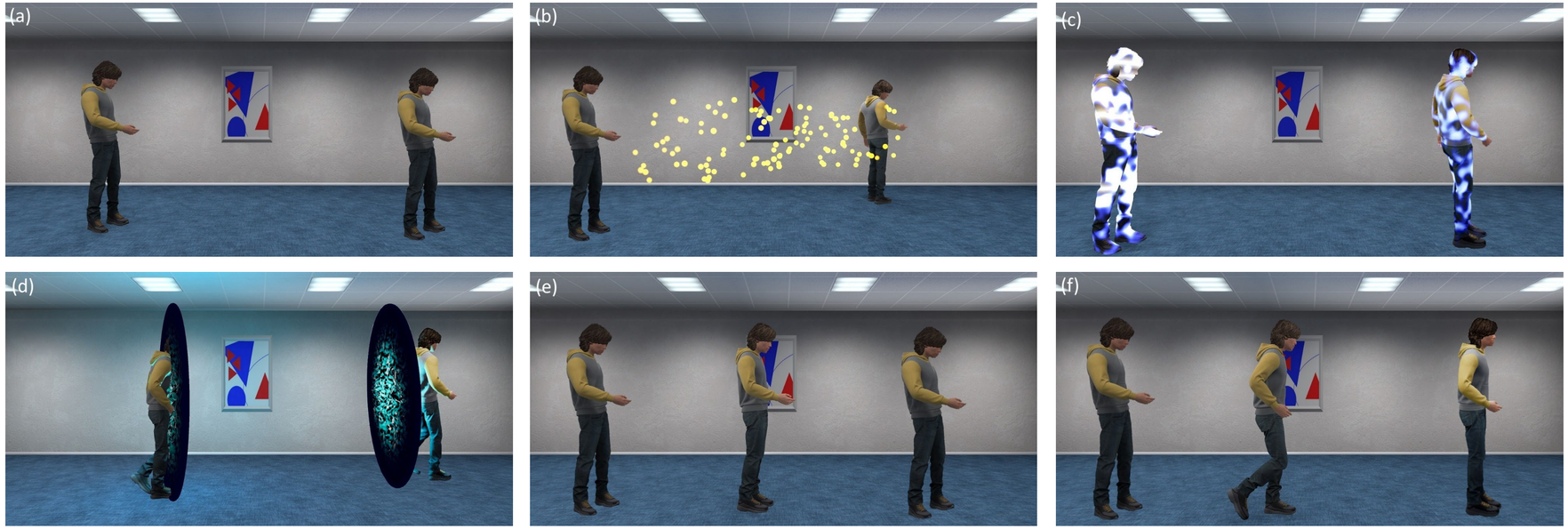
Bremen

CG VR

Thank you for your attention!
Questions?



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