Virtual Reality Assessment for Spatial Neglect

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Spatial Neglect is a reduced or absent attention to one side of the body, space, objects, or even mental imagery.

Spatial neglect is highly prognostic for rehabilitation outcome and caregiver burden.

Around 50% of stroke survivors is expected to show initial spatial neglect and 20% after one year.

Spatial Neglect is conventionally assessed using pen-and-paper tests. But they:

1. have little similarity to the real world, which is 3D and dynamic.
2. are insensitive to mild neglect and small changes over time.

Virtual Reality is a method to assess spatial cognition in life-like, yet controlled environments. We can track natural spatial behavior using 6D head-tracking, 6D motion-tracking, and eye-tracking.

The VR@SN platform combines precise tracking of movement and control of the visuo-spatial environment. This offers new opportunities for the assessment of spatial cognition in brain-injured patients and non-injured populations alike. Improving assessment of spatial neglect is an important first step towards the ultimate goal of individualized treatment.

PILOT DATA: MUSEUM SCENE

Controls’ head orientation vs. Patients’ head orientation

Individual horizontal eye-head control patterns

Results and Perspectives

MUSEUM SCENE: Controls orienetered equally to both sides with a consistent head-gaze control pattern.

Patients neglected the left of their body midline with two exceptions. Interestingly, many patients had abnormal head-gaze control patterns in the intact hemifield with large individual differences.

KITCHEN SCENE: Patients also exhibited a strong rightward bias in this more complex and naturalistic scene.

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