Heading Perception of Tunnel-Vision Patients

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Introduction

Human observers can perceive heading from optic flow even when the field of view is restricted to 5~10 degree (Correll & Banks, 1995; van den Dobbelsteen & Cornsweet, 1999; Warren & Katz, 1992).

Questions:
- Can tunnel-vision patients perceive heading from natural flow displays?

Experiment 1

Subjects:
- Retinitis pigmentosa (RP) patients (2 patients, Visual Field = 5 deg; 2 patients, Visual Field = 10 deg)
- 4 age-matched normal controls

Displays:
- Random-dot forward motion onground (2 m/s)
- Field of View = 128 x 95 deg
- Duration = 3 sec

Heading Perception Results

Results Summary:
- Comparable heading perception performance on textured ground and random-dot ground displays.
- For both RP patients and normal controls, heading performance gets worse with restricted visual field and fixed fixation.
- With free eye movements, RP patients looked at the FOE for most of the trials.

Experiment 2

Question:
- RP patients look for the fixation point (FOE) in optic flow to judge heading?

Eye Tracking Results

References

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Appendix

Eye Movement (Normal Control)

POM (Age = 35)