

PURPOSE

To study the suitability of the Pupil Core, a cost-effective and clinically implementable **eye-tracker**, for early diagnosis of neurological disorders. Pupil Core was compared and tested against the EyeLink 1000 Plus in a set of clinical trials developed [1] for **eye movement assessment in neurological disorders**.

MATERIALS AND METHODS

Subjects: 5 young healthy subjects (3 men and 2 women) with age 31.8 ± 8.5 years.

Set-up: The eye trackers registered eye movements simultaneously. The calibration was also performed at the same time using the same stimuli. The stimuli presentation, control of the eye trackers and data synchronisation was carried out by means of a custom developed script in python using the Psychopy package.

Pupil Core

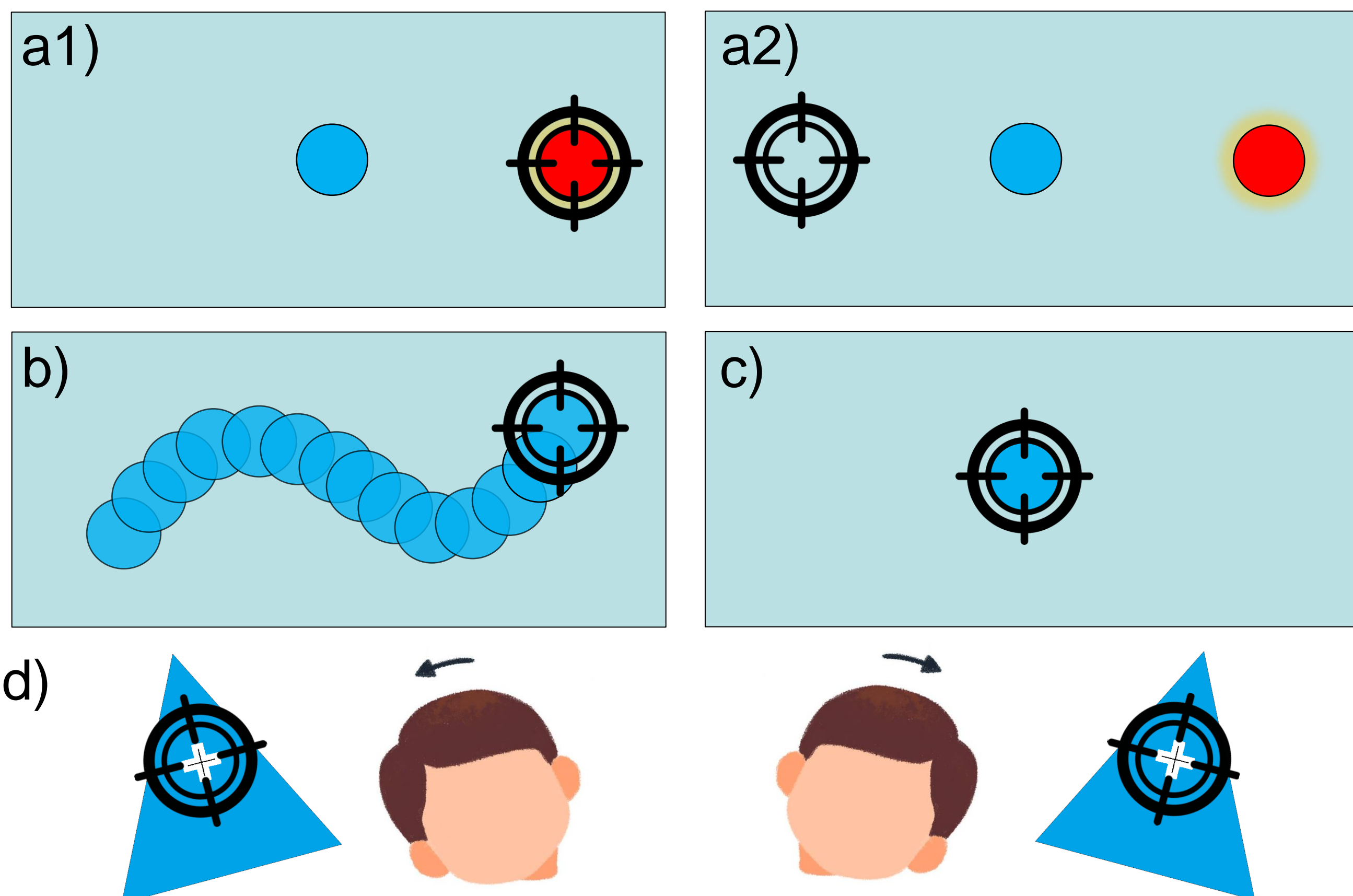


EyeLink 1000 Plus



Measurement protocol: Participants were asked to perform several visual guided tasks displayed on a computer screen:

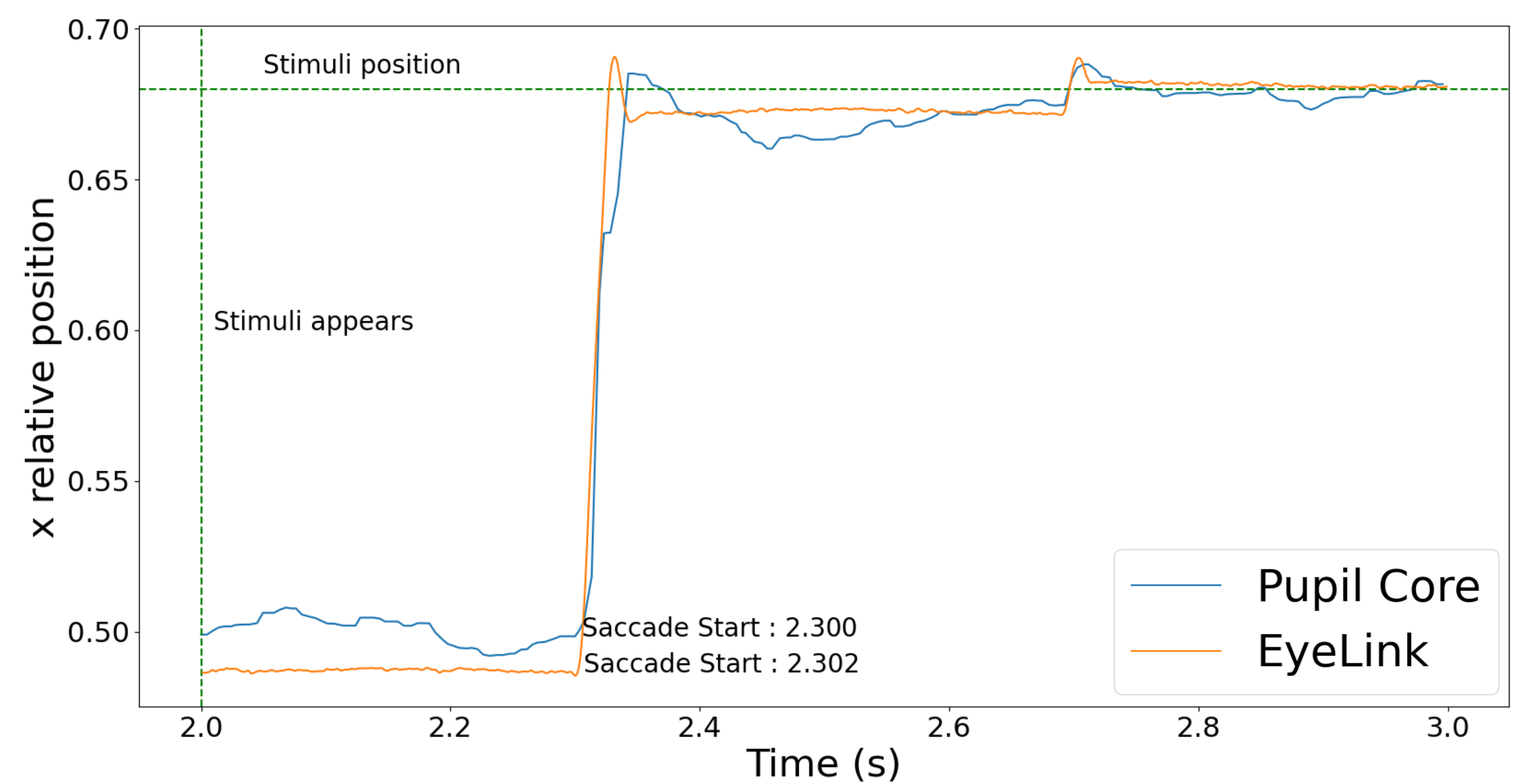
- Pro-saccade and a2) anti-saccade
- Smooth pursuit
- Fixation
- Head's roll fixation



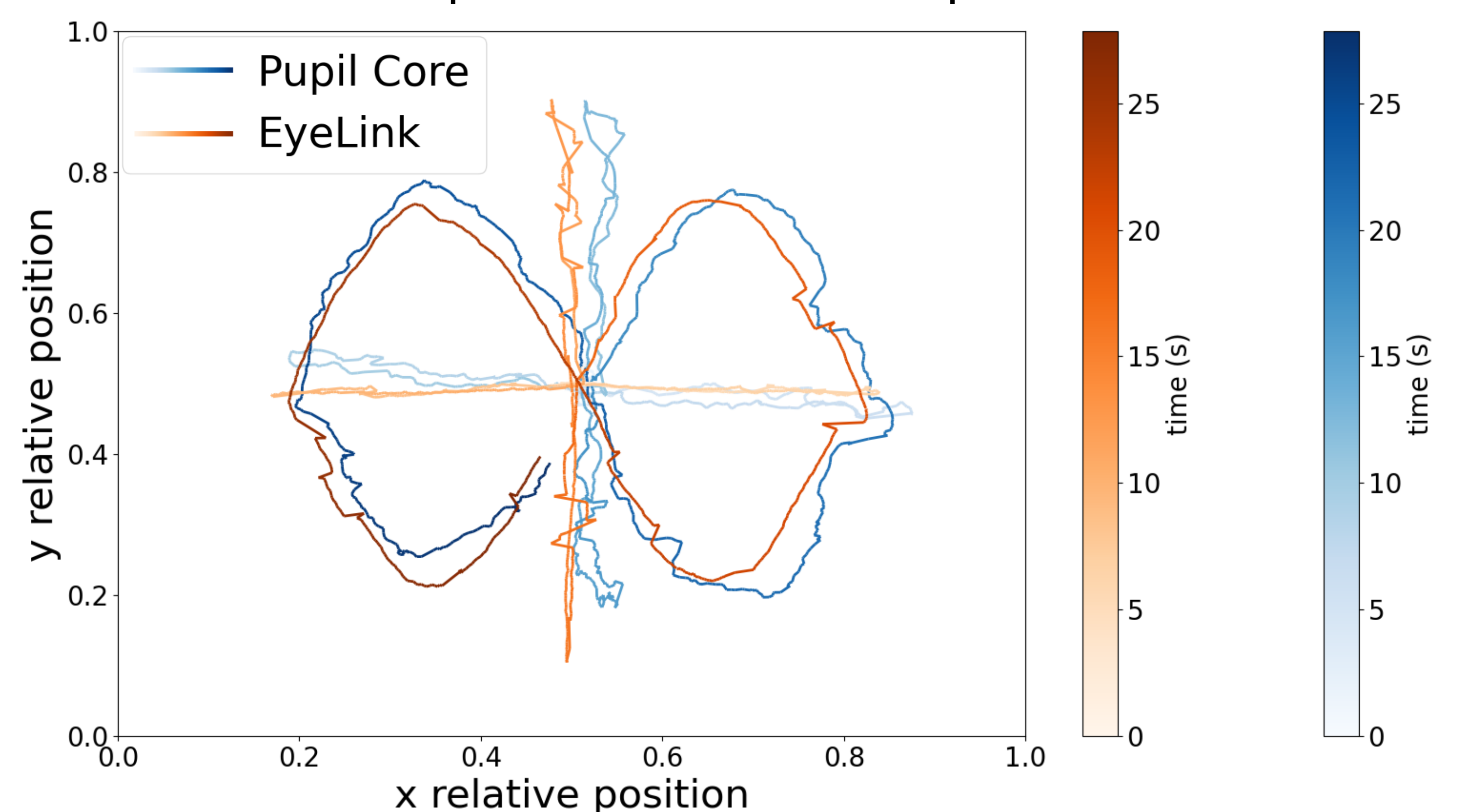
RESULTS

Visual task	Mean difference between eye trackers	
Pro-saccade latency	4.1 ± 2.9 ms	
Anti-Saccade latency	2.1 ± 3.0 ms	
Fixation	1.2 ± 0.3 °	
Head's roll fixation	Pupil Core vs stimuli	EyeLink vs stimuli
	2.4 ± 1.5 °	3.7 ± 1.1 °

Temporal response for both eye trackers in a pro-saccade:



Qualitative comparison of the smooth pursuit test:



CONCLUSIONS

- Results from Vinuela-Navarro *et al.*[1] highlight differences between control and patients with neurological disorders of 100 ms for the latency in anti-saccades and 1° in fixation tasks.
- The comparison between both instruments in our experiments has shown differences, but lower than those reported in the former study.
- Consequently, our data suggest that the Pupil Core can be considered suitable for the diagnosis of neurological disorders with enough accuracy.

References

[1] Vinuela-Navarro *et al.* (VPO 2022 submission) Eye movement control after COVID-19 disease: a pilot study.

ACKNOWLEDGMENT :This publication is part of the project PID2020-112527RB-I00, funded by MCIN/AEI/10.13039/501100011033

CONTACT ME:

joan.goset@upc.edu