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SWADAPT1: Evaluation on standardised circuits of the interest of a robotic module for assisting the driver of an electric wheelchair: pilot, prospective, controlled, randomised study

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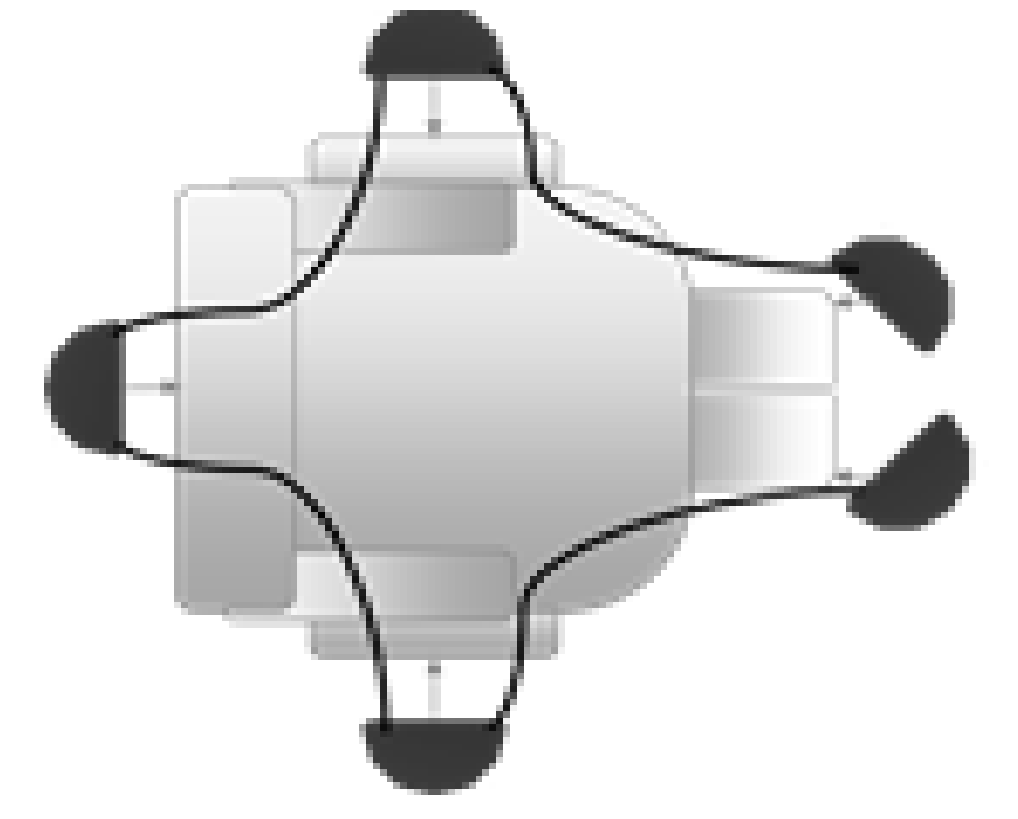
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SWADAPT1 : EVALUATION ON STANDARDISED CIRCUITS OF THE INTEREST OF A ROBOTIC MODULE FOR ASSISTING THE DRIVER OF AN ELECTRIC WHEELCHAIR: PILOT, PROSPECTIVE, CONTROLLED, RANDOMISED STUDY

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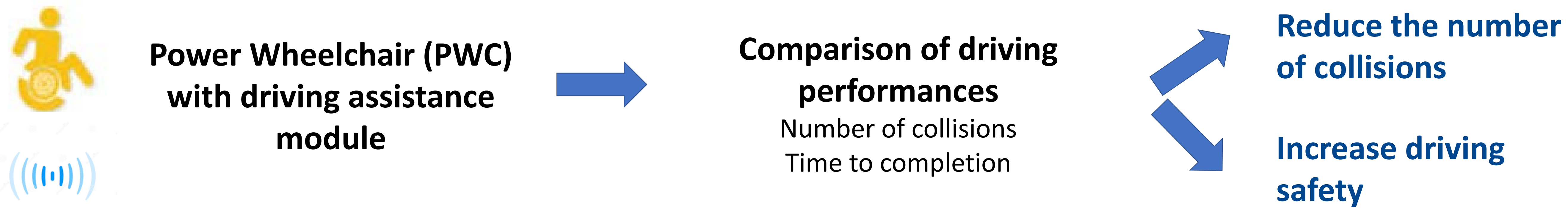


- Most people with disabilities require assistance and often use a technical mobility aid.
- Prevalence of people using wheelchairs = increase with an estimate ranging from 60 to 200 per 10,000 inhabitants (Vignier 2008).
- 10% of wheelchair users use electric models (Kaye 2002; Vignier 2008)
- 25% of accidents with Power Wheelchair (PWC) (Kirby 1995).
- 100 000 accidents involving wheelchair users in the United States in 2006,
- 54.7% of subjects reported having had at least 1 accident in the last 3 years (Chen 2011).



a prototype anti-collision system based on Infra Red technology and algorithms for a low cost solution

OBJECTIVES



MATERIALS AND METHODS

PROSPECTIVE

MONOCENTRIC

CONTROLLED

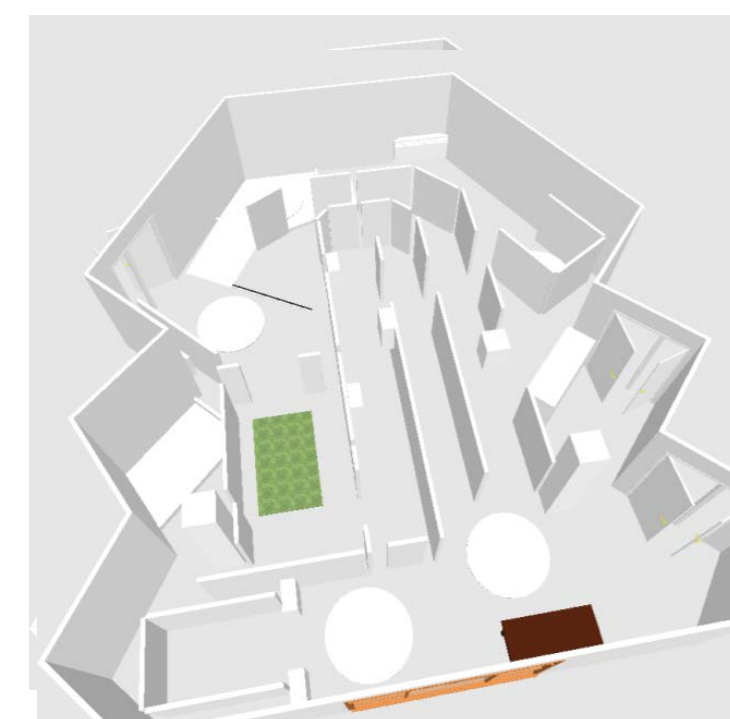
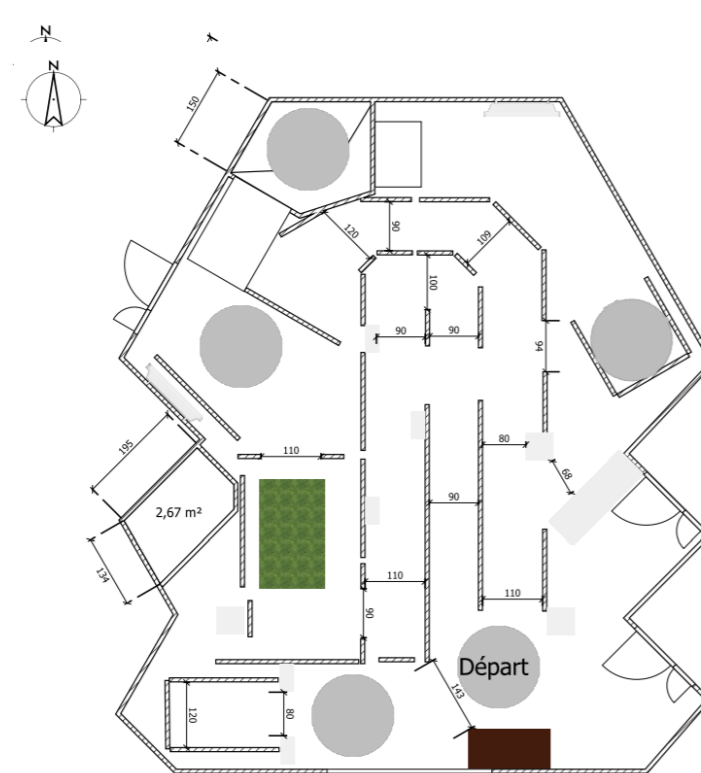
RANDOMIZED

SINGLE-BLIND

3 circuits of increasing complexity (C1, C2, C3).
 Conditions

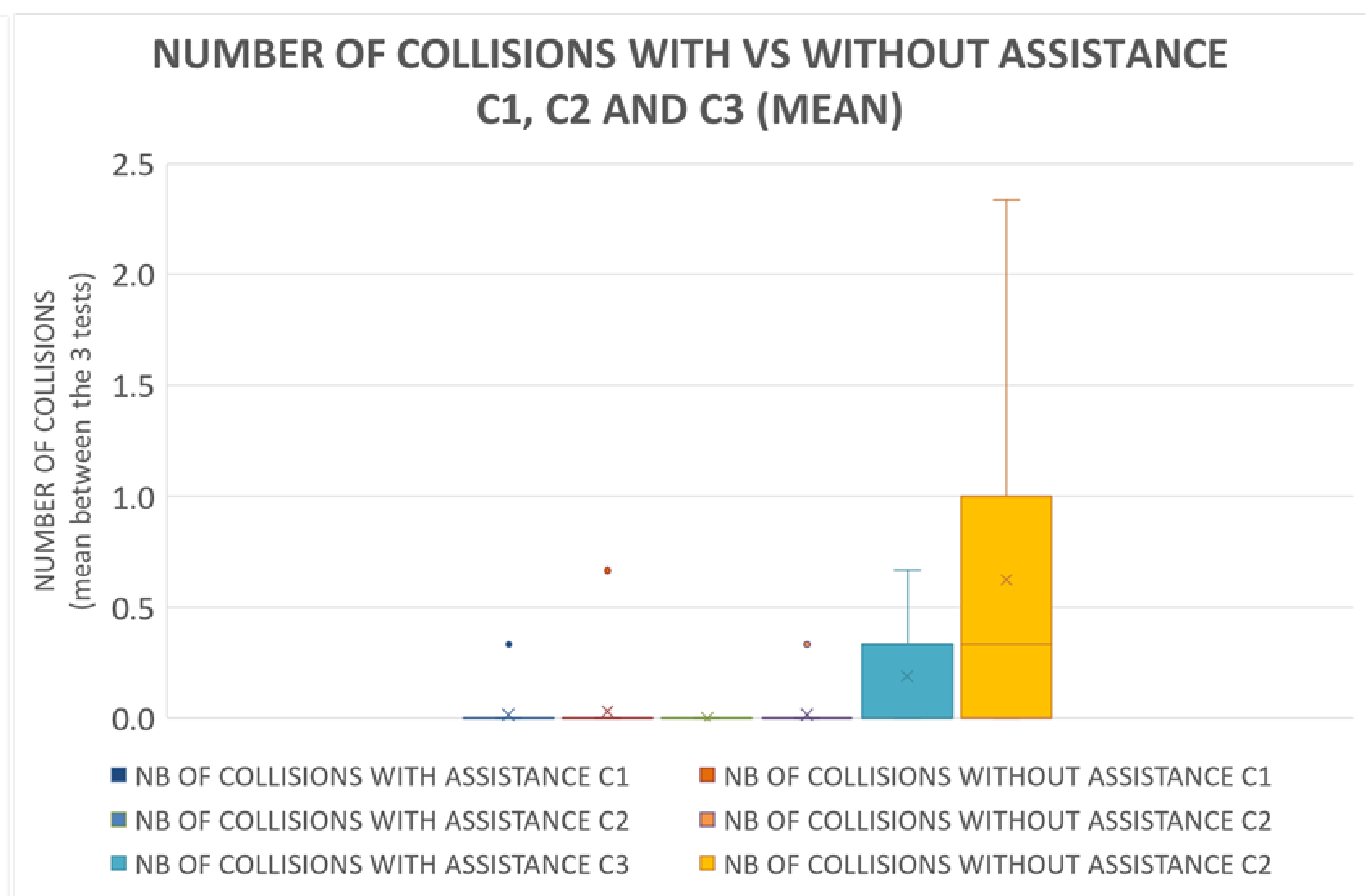
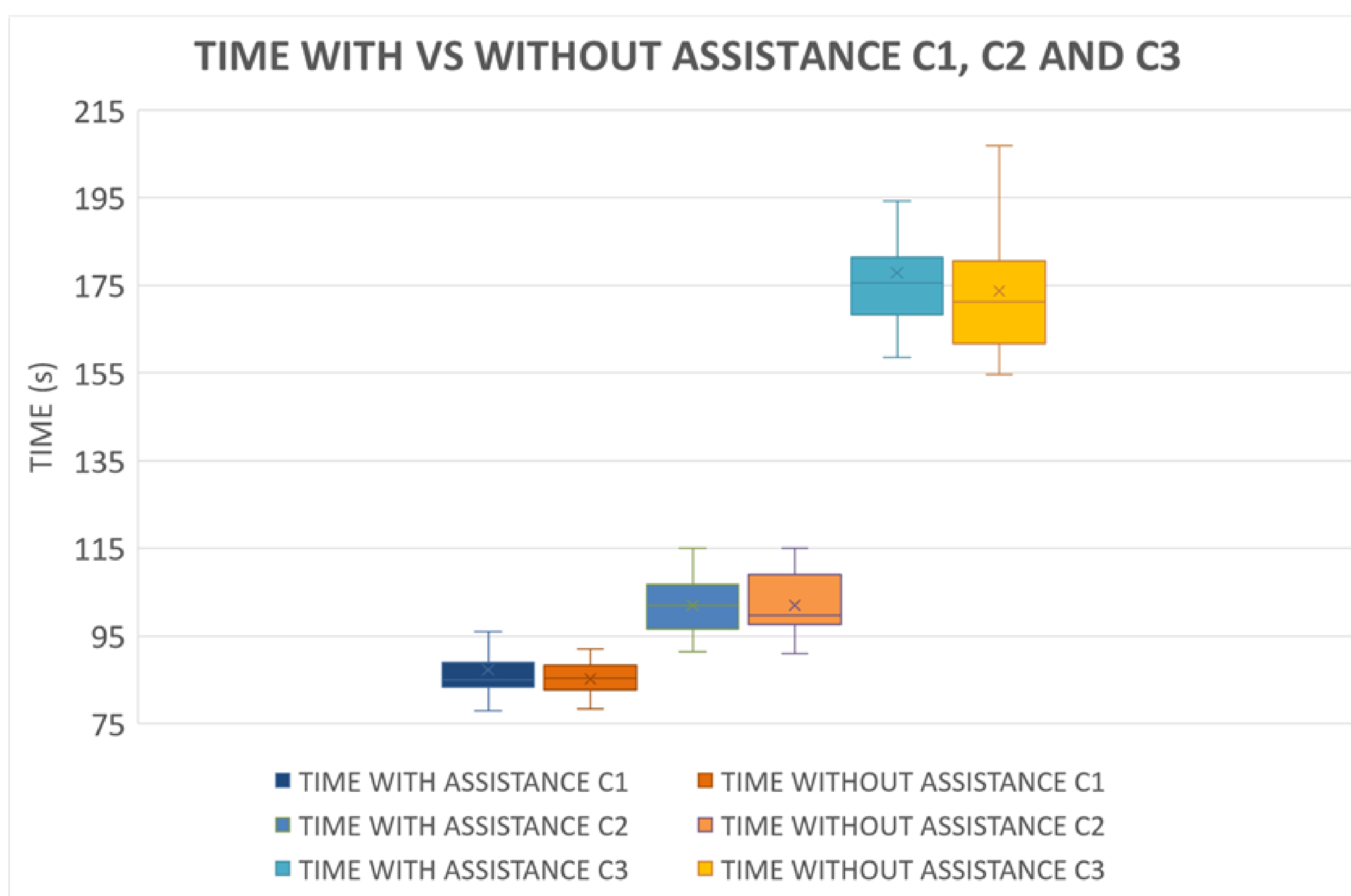


population
23 patients with neurological disabilities who usually use PWC



Example of circuit 3 : map, 3D representation and picture

RESULTS



DISCUSSION - CONCLUSION

- Statistically significant reduction in the number of collisions on the most complex circuit (13 versus 46)
- Significant slowdown due to the activation of the driver assistance module but a real increase of safety.

→ Efficiency of the PWC driver assistance module **in terms of safety without reducing travel speed** in a population of people with disabilities who are usual wheelchair drivers.

Future trials : **tests on the target population** in failure or driving difficulties

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