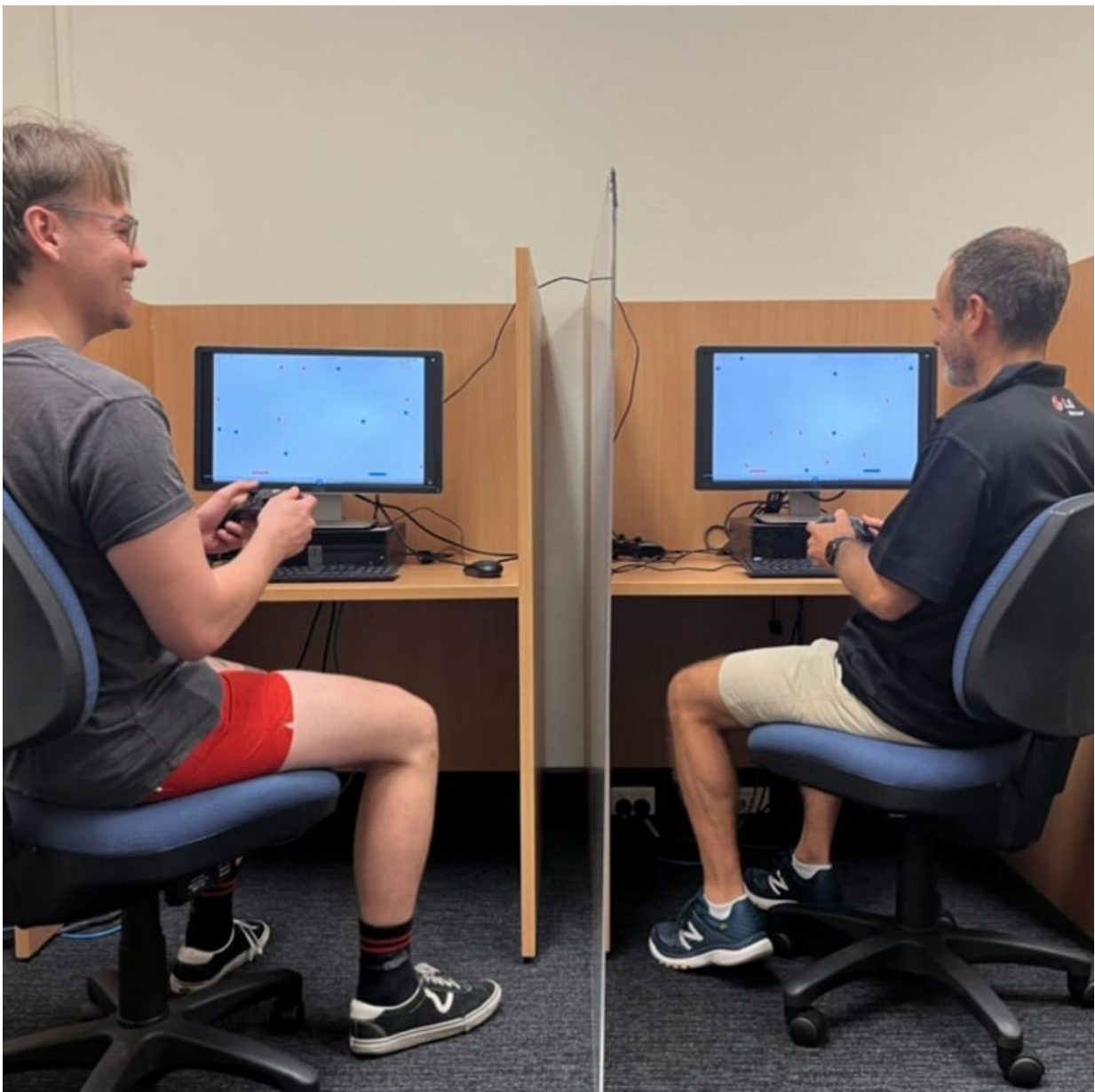# Evaluating human performance in competitive and collaborative human-machine teams

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Laiton (L) with his PhD Supervisor, Associate Professor Ami Eidels playing Pong. Credit: Newcastle University

Do teams perform better when working collaboratively or competitively? How does a human perform when working alongside AI?

A first-of-its-kind study has put the teamwork skills of both humans and robots to the test in a computer-based challenge like the arcade game, Pong.

Led by two University of Newcastle Ph.D. students, the study compared the performance of teams with an AI player and a human player against teams with two human players. The skill level of the AI player was matched to the skill level of the human players to fairly assess teamwork capability.

Human teams outperformed teams that had a robot player. Human players demonstrated better intuition to understand their partner and adjust their actions to improve team performance, whereas teams with a robot player seemed to lack this competitive edge.

The researchers also investigated whether people perform better when they are competing or collaborating. Surprisingly, they found teams playing collaboratively outperformed teams playing competitively against each other.

Published in the journal *Topics in Cognitive Science*, the study was led by Ph.D. students Laiton Hedley and Murray Bennett from the Newcastle Cognition Lab at the University's School of Psychological Sciences.

Cognitive psychology is the study of how the human brain works—how we think, remember and learn.

More information: Murray S. Bennett et al, Human Performance in Competitive and Collaborative Human–Machine Teams, *Topics in Cognitive Science* (2023). DOI: 10.1111/tops.12683

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