

Drone safety: User-centric control software improves pilot performance and safety

October 4 2016

A new study into the safety of drone control interfaces suggests that an overhaul of remote control methods ranging from joysticks to smartphone apps could reduce the number of drone accidents. The findings, published this week in *Interacting with Computers*, suggest that current user interfaces used in some drones makes it difficult for pilots to perceive hazards and react appropriately.

Advances in commercial uses of drones, in film-making and merchandise delivery, for example, as well an increase in amateur interest, has led to a surge in [drone](#) related accidents causing damage to property as well as harm to humans. Previous research suggests that approximately one third of drone accidents are caused by user error, a number that the authors of this latest study believe can be significantly reduced by improving the control software.

Remote control of drones is prevalent particularly in low-cost devices currently on the market for novice pilots, and creates a misalignment of perspectives between the user and the drone. For example, when the drone is flying away from its [remote controller](#), the left-right control directions are aligned with those of the device enabling the user to steer with ease: they steer to the right and the drone moves to the right. However, when the drone turns around and flies towards its remote controller, the left-right direction of the drone must be controlled from the opposite direction of its remote controller interface: the user must steer right to move the drone left. The need for the pilot to mentally rotate negatively impacts their performance, slowing down their

response time, impeding hazard perception, and limiting spatial awareness.

The study was comprised of two experiments wherein participants used flight simulators to compare the ease and safety of user-centric controls (such as those used by an airplane pilot) with external piloting (remote control methods ranging from joysticks to smartphone apps). The 30 participants had no prior experience driving drones or remote control cars, and were tasked with guiding their drone through an obstacle course. The study measured obstacle avoidance [response time](#) as well as avoidance success rate, and shows the user-centric interface improving performance on both counts.

Findings support the conclusion that a user-centric interface design significantly improves performance of drone pilots, and resolves some of the user control issues undermining drone safety.

Professor Kwangsu Cho explains "despite increases in drone-crashes, research and development on user-centered control interfaces has been limited. The user interface of drones is critical to safety, quality piloting, and satisfaction. We are developing other user-centered drone interfaces especially for non-experts, and are eager to collaborate with manufacturers to improve safety".

More information: Kwangsu Cho et al, Fly a Drone Safely: Evaluation of an Embodied Egocentric Drone Controller Interface, *Interacting with Computers* (2016). [DOI: 10.1093/iwc/iww027](https://doi.org/10.1093/iwc/iww027)

Provided by Oxford University Press

Citation: Drone safety: User-centric control software improves pilot performance and safety

(2016, October 4) retrieved 9 April 2024 from <https://phys.org/news/2016-10-drone-safety-user-centric-software.html>

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