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A New Command Space Design Tool for the Royal Navy

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HIT Team researchers have developed a novel interactive command space planning tool using games-based simulation techniques, enabling future Royal Navy (RN) multi-role vessel designers to explore a variety of command space layout concepts prior to finalising a specific solution.

The Command Space Study project was sponsored by the Defence Science & Technology Laboratory (Dstl) at Portsdown West near Portsmouth, via the BAE Systems-led Maritime Collaborative Enterprise (MarCE). The project was designed with the aim of optimising team-working amongst RN command teams.

Central to the concept was the ability to explore multiple command space layouts in detail and, in a short period of time, eliciting feedback from serving RN personnel. The result was a detailed computer simulation of two types of vessel decks and spaces, allowing for multiple layouts to be created, reviewed and modified. The initial prototype, which is based on the Unity game engine, provides a start-up 3D representation of one of two generic (and initially empty) decks, together with bulkhead and side panel representations.

By moving the bulkheads and selecting a range of objects from a 3D library, the end user is able to construct and save a range of different options for subsequent presentation, discussion and evaluation. The object libraries include a variety of single and dual-screen consoles, wall-mounted displays, command tables, seats, ladders, and so on. The user is also able to select a number of 5th, 50th and 95th percentile avatars (male and female – based on data from recent military anthropometric data sources) and can position these around the deck area, in either seated or standing postures. Seated avatars can be configured to represent basic console poses and, for early ergonomics assessments, all avatars can be endowed with basic vision cones and reach envelopes.

End users are able to visualise the results of their designs from both a third-person and first-person perspective, and the tool also supports the use of a range of human-system input and display devices, including head-tracked head-mounted displays, such as the Oculus Rift, game controllers, such as the Xbox gamepad and spatial hand trackers, such as the Razer Hydras.

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