

Augmented Reality trials for unmanned air platforms

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Using a Sony HMZ-T1 Head-Mounted Display fitted with a small webcam, BAE Systems' Typhoon Chief Test Pilot Mark Bowman takes part in a unique experiment to establish whether or not commercial off-the-shelf Augmented Reality (AR) techniques can be used to support the development of future operator interfaces for unmanned air platforms.



The experiments were conducted during March by EECE students at BAE Systems Military Air & Information Division at Warton and involved personnel as diverse as aircrew and advanced systems researchers to engineers and human factors specialists. The challenge given by EECE's HIT Team Director **Professor Bob Stone** (</staff/profiles/eece/stone-bob.aspx>) to MEng student Chris Bibb, supported by MPhil researcher Vish Shingari, was to build a reconfigurable operator console "shell" and to develop a marker-based AR system capable of allowing the placement of different virtual control and display elements - switches, screens, joysticks, rotary selectors, and so on.

The overall concept was to assess whether or not AR technology is mature enough to replace the previously costly and time-consuming process of developing physical console and workstation mock-ups, which can become quite a costly exercise if physical control and display elements are required for prototype testing, not to mention the resources needed to make modifications after each set of end user tests. The results of the evaluation were very interesting indeed and, once again, demonstrated the somewhat immature nature of current commercial/Open Source AR software, not to mention limitations in using narrow field-of-view cameras in contexts that demand technologies capable of matching the human user's natural visual field of view.

Nevertheless, the BAE Systems participants found the experience of great interest, as AR technologies feature quite significantly on their "wish list" of future interactive technologies for simulation, command and control and other defence/aerospace applications. Prof. Stone commented, "We have had excellent support from BAE Systems for this MEng student project and have, as a result, developed a strong relationship with the Human Factors and Advanced Systems teams at Warton. We're now in discussions with the personnel at Warton to investigate future research opportunities both at postgraduate student and School level".