Next-Generation Simulation that Revolutionizes Training – Mixed Reality Simulators

Dan Brockway, VP Marketing

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MAK’s Solutions Help Customers Demonstrate, Experiment, and Train

Rapid Scenario Generation
- Proposals
- Demonstration
- Concept Development
- Experimentation

System Development & Analytics
- Systems Prototyping
- Systems Test
- TTP Development & Analysis

Training & Wargaming
- Trainers
- Simulators
- Wargaming

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Over Two Decades Helping Customers Build and Populate 3D Simulated Environments
Our technology fits in many system designs
JTAC Trainer
Shipboard Weapons Systems
Mechanized Infantry Trainers
Classroom Training
Wargaming
Air Mission Operations Center
Live training is extremely expensive
Immersive Simulators are very expensive also
Mixed Reality Simulators bring the cost way down

Green areas in head-mounted-camera video are replaced with the corresponding virtual scene and displayed in pilot’s HMD.
Mixed Reality Simulator – Green Screen Approach

Same image processing using a green screen outside the cockpit.
Mixed Reality Simulator – Virtual Cockpit Approach

Here the cockpit is rendered as part of the virtual scene.
Mixed Reality Simulator – No Green Screen

Without a green screen, precise registration between the physical gear and the virtual model mask is required. Inside the mask the camera video is used, outside the mask the virtual video is used.
A combination of techniques can be used in setups with a partial green-screen.
Example of Limited Green Screen
Depth computed from head-mounted Stereo cameras can be used to determine which part of the camera video to use. Everywhere else, virtual video is used.
Augmented Reality Simulator – Future solution

Requires precise registration, a completely dark simulator environment, and high-res see-through, wide-angle displays.

The virtual cockpit is used to mask the virtual scene so that only areas that appear on the black cockpit windows are projected onto the pilot’s see-through display.
Mixed Reality is today’s sweet spot for delivering low-cost immersive training

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