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License Opportunities

MITRE technology transfer office

MITRE's Technology Transfer program was established in 1999 to place MITRE-developed technologies in the hands of commercial companies that can make them available to our sponsors and the public as supported, affordable products. Working on critical issues of national importance, MITRE continues to develop new and innovative technologies.

MITRE Immersive Vision System (MIVS)

Telepresence technologies rely on sensory input and an advanced graphical interface to give the user the impression that he or she is actually inside a made-up environment. The MITRE Immersive Vision System (MIVS) integrates commercial components with software created by MITRE's scientists. It uses a commercial hemispherical digital camera system and a head-mounted display. An orientation sensor, is attached to the display tracks the position of the user's head while allowing the person to move around in any direction. A wireless signal is sent from the head-tracking device to the hemispherical camera on the robot to control its position.

The MIVS started out as a MITRE-sponsored research project, stemming from MITRE's Advanced Perception and Three-Dimensional Simultaneous Localization and Mapping (3D-SLAM) research projects. The Advanced Perception project team is developing new methods for combining information from multiple sensors on Unmanned Ground Vehicles (UGV) to improve maneuvering, navigation, safety, and situational awareness. The 3D-SLAM project team is developing technology to enable soldiers to build a 3D, real-time view of an unknown environment before entering it. Designed to provide situational awareness of urban environments, 3D-SLAM uses video sensors and visual odometry on UGVs and hovering unmanned aircraft systems to create 3D views.

Applications

A vision system like MIVS would be useful in many applications. Unmanned platforms will be the primary vehicles for this research. For design purposes, MIVS represents a fast, intuitive vision system for multiple users with no blind spots and excellent field-of-view characteristics.

Benefits

The spherical camera array employed in the vision system allows for increased physical durability and multiuser/multi-region of interest support. Conventional camera systems use motors to steer the vision system. These motors have a high failure rate and tend to be expensive. The MIVS technology employs no moving parts and, as a result, is easier to ruggedize. The tiling of images into regions of interest also reduces the bandwidth required to project the composite image.

Additional Information and Links

Van Cleave, D., January 2009, "Immersive Vision Gives the Best Control to Military Robots," The MITRE Digest, *www.mitre.org/news/digest/advanced_research/01_09/vision.html.*

MITRE Immersive Vision System video, February 2009, *www.youtube.com/watch?v=811M9TDSHOQ&feature=PlayList&p=841E18196AACAB7C&index=0.*

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