

Designing a Common Robotic Control System for Military Platforms

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Abstract

To replace numerous platform-specific operator control units, this paper presents a design methodology and implementation for a portable common robotic control system for military platforms that is chassis and operator control unit independent. Using a common controller will enable research and development of semi and fully autonomous systems using current military platforms. In our design, we exploit an embedded computer with multiple input/output ports to integrate additional sensors and cameras. With new sensors, different operating modes can be introduced to include way-point navigation, blob tracking and obstacle detection and avoidance. Existing military platforms could easily be networked and teleoperated or enabled with an autopilot to perform critical missions. Our approach standardizes the controller to platform link and utilizes a computer-based graphical user interface to control many of the existing military platforms via wireless connectivity. By leveraging low cost, off-the-shelf components, existing wireless infrastructures with decreased latencies, our highly programmable and adaptable control system can also be applied to civilian usage in a wide variety of areas, such as search and rescue, fire fighting, assisting the handicapped and others. Regardless of the sector, an urgent need exists to meet the current challenges of unmanned system interoperability. We achieve a level of standardization between various platforms in order to incorporate greater autonomy and intelligence.

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