



NASA SBIR 2011 Phase I Solicitation

X7.01 Human Robotic Systems - Human Robot Interfaces

Lead Center: ARC

Participating Center(s): JPL, JSC

The objective of this subtopic is to create human-robot interfaces that improve the human exploration of space. Robots can perform tasks to assist and off-load work from astronauts. Robots may perform this work before, in support of, or after humans. Ground controllers and astronauts will remotely operate robots using a range of control modes, over multiple distances (shared-space, line-of-sight, in orbit, and interplanetary), and with a range of time-delay and communications bandwidth.

This subtopic seeks to develop new technologies that enable crew and ground controllers to better operate, monitor and supervise semi-autonomous robots. Of particular interest is software that improves robot operator productivity, situational awareness, and effectiveness.

Proposals are sought that address the following technology needs:

- Crew telerobotic interfaces. User interfaces that enable crew to remotely operate and monitor robots from inside a flight vehicle, habitat and/or during an extra-vehicular activity (EVA). User interfaces must be appropriate and relevant for use with near-term flight systems.
- Robot performance monitoring software. Software tools that enable remote monitoring of robot performance, detection of anomalies and contingencies, assessment of robot utilization and situational awareness of remote robot operations.
- Robot tactical planning software. Software tools that enable efficient, rapid handling of contingencies during robot tactical operations. This may involve a combination of embedded and user interface modules.
- Robot ground data systems. Systems and software for robot command planning and sequencing, telemetry processing, sensor/instrument data management, and automating ground control functions.

This subtopic does not solicit proposals for direct teloperation (e.g., joystick-based rate control), telepresence, or

immersive virtual reality subsystems or systems.