NASA SBIR 2011 Phase I Solicitation

X15.01   A New Technique for Automated Analyses of Raw Operational Videos

Lead Center: JSC

Participating Center(s): ARC

Develop a software tool that automatically processes raw motion video footage (from a single conventional 2D camera) of a crew (spacecraft or ground) during a space mission.

Such a tool is needed to address vehicle/habitat design issues, as well as crew-to-crew interaction issues, on the ground. For example, unprocessed space mission operational videos down linked from a spacecraft that involve humans as the subjects of interest need to be analyzed on the ground for their motion and behavioral health information.

Requirements:

- The raw video data shall be video footages from a single conventional 2D camera and with no special lighting or fiduciary markers.

- The processed data shall contain the subjects' geometric information (position, movement, acceleration) relative to their operational environment and crewmates.

- A "tool chest" shall be available for visualization aids, velocity computations, etc. For visualization aids, the tool chest shall enable the user to specify areas or actions of interest. The software shall then locate, mark, count, etc. to indicate how many times the crew accessed a piece of hardware, traversed a path, reached above their heads, etc.

Desirable: 3D information extraction - ability to extract 3D information from the raw video to enable high-precision human motion analyses using the software's tool chest.

Phase I Deliverable: Algorithm

Phase II Deliverable: Functional software prototype