

Frank De Winne is to evaluate "WEAR" technology in orbit

On Saturday, September 19, 2009, the Belgian astronaut Frank De Winne will test in orbit a new tool designed to assist crew of the International Space Station (ISS) in the execution of maintenance tasks inside the Columbus laboratory. This tool called WEAR for "Wearable Augmented Reality" has been developed by the Belgian company Space Applications Services with headquarters located in Zaventem.

WEAR is a powerful lightweight and compact tool which superimposes video, animations, graphics and text in the field of view of an astronaut. This assists him in localising and manipulating complex equipment just at the moment he needs the support. The astronaut interacts with WEAR solely by voice allowing him to use both hands to perform his task.

The tool comprises a helmet with a monocular goggle (Head Mounted Display), two cameras, an inertial measurement unit and an audio interface all connected to a small computer. The goggle allows vision in "Augmented Reality" i.e. the wearer's position and head orientation are computed in real-time by processing the images recorded by one of the cameras and used by the software to compute where to project the virtual images over the actual elements of the scene. WEAR provides other useful functions such as speech recognition enabling hands-free control of the tool, speech synthesis, recording of video and audio sequences as well as vision-based scanning of bar codes..

WEAR will be used on the ISS this Saturday to assist astronauts performing a complex maintenance procedure in the Columbus European laboratory..

Beyond support to astronauts, ground applications in fields as diverse as architecture and construction are planned. A ground specific version of WEAR for use in outdoor environment is in development and will be marketed in the coming months..

WEAR is funded 50/50 by Space Applications Services and ESA with the support of the Belgian Science Policy Office. Space Applications Services is prime contractor for the project and its Systems and Ground Segment (S&GS) group had responsibility for the design, development, validation and flight qualification of WEAR. The group Vision for Industry Communication and Services (VISICS) of the Katholieke Universiteit Leuven (KUL) is the subcontractor responsible for the development of the localization software based on real-time image processing..

A synopsis describing the WEAR operations on ISS scheduled for Saturday is presented in Annex. .

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ANNEXES:

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Synopsis of the WEAR evaluation sessions

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WEAR project leaflet

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Two photos taken from inside the Columbus mockup located at the European Astronaut Centre (EAC) of Köln and presenting the Belgian astronaut Frank De Winne together with his backup the Dutch astronaut André Kuipers during a training session with WEAR.

Photo 1 / Photo 2

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Illustration and video of what Frank De Winne will actually see through the WEAR goggle during execution of the maintenance procedure selected for evaluating the tool.