

Space Technology

Game Changing Development

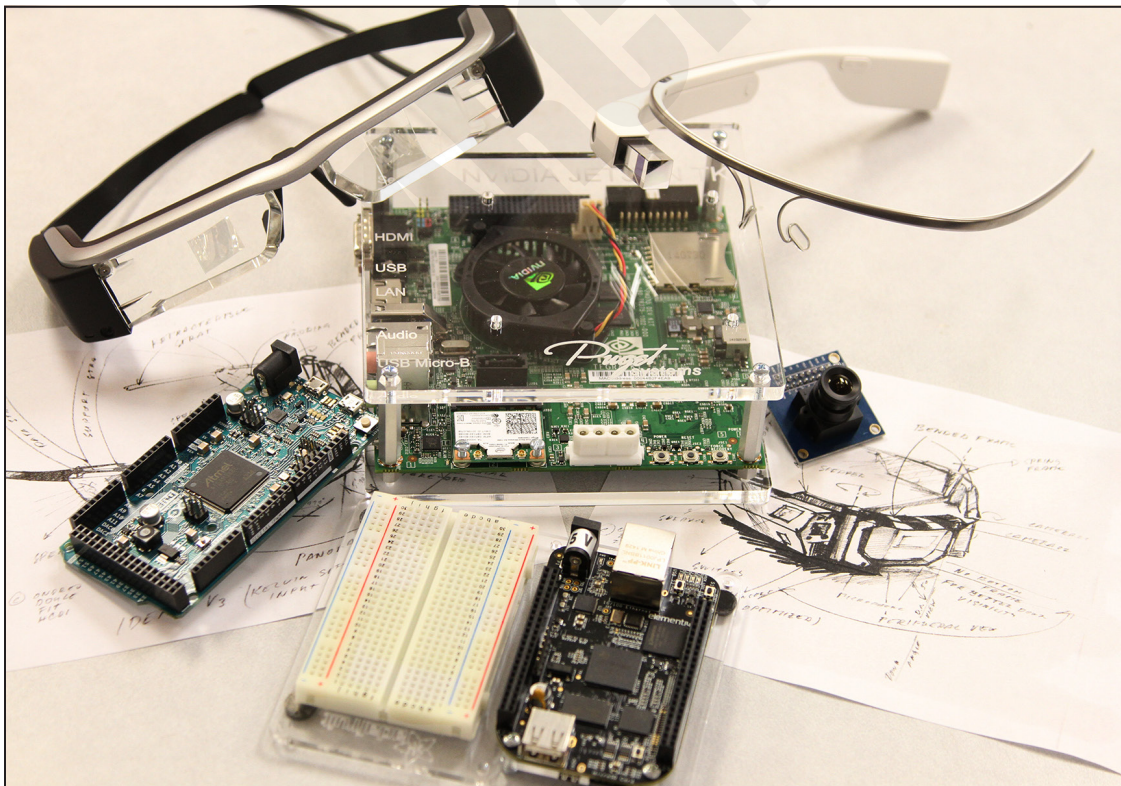
IDEAS: Integrated Display and Environmental Awareness System

NASAfacts

Imagine that you are an engineer or technician working on a critical space system and all the information you need is immediately available to you when you need it. All your work procedures, not just the ones you happen to have with you, are accessible on demand. You can quickly document your work with images and text with ease. Every move you make is recorded on demand, and you can play it back later for training or

analysis. For your particular task, you can immediately see exactly what others have done before you. Imagine having a telepresence capability that streams what you are seeing—as you see it—to colleagues anywhere in the world.

In addition, all the emergency sensors and system health data are instantly available. When an emergency occurs, you find out



The IDEAS team is currently investigating the use of commercial off-the-shelf smart glasses, development boards, and sensors for inclusion in the final design.

immediately, and further instructions are made available exactly when you need them. And all of this can be wirelessly transmitted across the globe or stored locally. Now imagine all of this displayed and accessible right from your safety goggles using an embedded, lightweight wearable computer.

Emerging wearable technologies are showing promise across many industries, from manufacturing to medical, and now NASA is investing in this exciting technology to apply it to the Agency's unique mission.

The technology being developed for the Integrated Display and Environmental Awareness System (IDEAS) project is a wearable computer system with an optical heads-up display (HUD) providing various means of communication and augmented reality data to the user. The wearable computer, in the form of smart glasses, would allow personnel to have access to and modify critical information on a transparent, interactive display in a nonobstructed field of view, without taking their eyes or hands off the critical work in front of them.

The data users may need include life support information, air pressure, and instrument measurements (such as torque). The product is being designed in a modular manner so that the user can adjust device capabilities depending on needs. In addition, via its camera and microphone, the wearable computer would allow a telepresence capability by sending real-time audio and video to a third party.

Such a technology will dramatically improve situational awareness, thus improving safety and efficiency. Initially the technology will be proven-out for launch site ground operations, but in the future it can be transitioned for use in many other areas, ranging from an airplane's cockpit to laboratory research on the

International Space Station, and even eventually on an exploration mission on the Martian surface. In all these realms users will need assistance, and this technology will bring them the needed information where and when it is necessary.

The IDEAS project is being managed by a NASA Early Career Team at Kennedy Space Center in Florida as part of the Agency's Game Changing Development (GCD) Program. GCD is part of NASA's Space Technology Mission Directorate (STMD).

This KSC team is one of four that were selected from across the Agency as part of STMD's Early Career Initiative (ECI) pilot program. The program encourages creativity and innovation among early-career NASA technologists by engaging them in hands-on technology development opportunities needed for future missions.

The NASA team has partnered with Abacus Technology of Chevy Chase, Maryland; Florida Institute of Technology's Human-Centered Design Institute of Melbourne, Florida; and Purple Rock Scissors of Orlando, Florida.

The GCD Program investigates ideas and approaches that could solve significant technological problems and revolutionize future space endeavors. GCD projects develop technologies through component and subsystem testing on Earth to prepare them for future use in space. GCD is part of NASA's Space Technology Mission Directorate.

For more information about GCD, please visit <http://gameon.nasa.gov/>

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