Exoskeletons, Robots and System Software: Tools for the Warfighter?

Paul Flanagan, Tuesday, April 24, 2012 11:15 am– 12:00 pm

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Emerging technologies such as exoskeletons, robots, drones, and the underlying software are and will change the face of the battlefield. Warfighters will be able to carry more and cover longer distances, but with less effort. Robots and drones greatly decrease exposure to hazardous situations while augmenting human capabilities. Join us for an enlightening session where we expose the power of these technologies in an interactive session and where we think they are headed.
• Robotics is in 2004 at the same place that computers were in 1978. In 1978 computers were expensive, owned by large organizations, notably the military, and performed tedious, routine functions. Since that time computers have become small, inexpensive, commonplace and are used in ways never imaged in 1978.
An exoskeleton is a wearable robot suit that basically does any lifting for the wearer, enabling him or her to do the work of two or three soldiers.
Robotic Assisted Humans

HAL-3

- Backpack
- Controller (PC)
- Wireless LAN
- Battery
- Power Unit
  - For Power up of Lower Limb
- Angle Sensor
  - Detection of joint angle
- EGM Sensor
  - Detection of slight human body voltage that is transferred from the brain to the muscle

Counteraction force sensor
- Detection of gravity center of the wearer

Figure 2: HAL3
Robotic Assisted Humans

Figure 3: HAL5

Figure 4: HAL5 demonstration at EXPO 2005

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• http://www.ted.com/talks/eythor_bender_demos_human_exoskeletons.html
DARPA Challenges


http://link.brightcove.com/services/link/bcpid1374481183/bctid1377895007

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Google’s Robot Car

- [Link](http://www.youtube.com/watch?v=bp9KBrH8H04)

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DoD robots in the air 2004?

Features

Air Vehicle
- ~36,500 lb Gross Weight
- ~18,000 lb Empty Weight
- ~0.8 Mach / 40,000 ft altitude
- 1100-1300 nm combat radius

J-UCAV X-45 System

http://www.airforce-technology.com/projects/x-45-ucav/
Air Force special operations forces from the 22nd and 23rd Special Tactics Squadrons prepare to launch a Pointer UAV from the deck of USS Alabama.

http://www.time.com/time/specials/packages/article/0,28804,2074830_2080103_2080115,00.html
Questions and Comments