Wearable Supercomputing Platform for Search-and-rescue Operations

VTIP 21-053: "A Wearable Computing Cluster and Platform for Multi-agent Cyberphysical Systems"

THE CHALLENGE

Each year, thousands of people go missing in the United States. Coordinated search and rescue operations provide the best chance to locate a missing individual alive. In remote areas, challenging terrain and other search constraints represent a barrier to human searchers. Unmanned aerial vehicles (UAV) can more easily explore difficult terrain, and gather information beyond human capability. However, cloud computing systems necessary for UAV coordination, tend to be impractical in remote or disrupted environments.

OUR SOLUTION

Virginia Tech researchers have developed a wearable computing backpack that consists of a scalable array of specialized computers and a networking head. The computing array allows for distributed processing and storage while leveraging networking capabilities to aid cooperative environmental or situational cognition. The form factor and custom chassis renders the backpack rugged and weather proof for ground operations such as search and rescue. The design ensures scalability of the system and sufficiently provides for the electrical power demands of onboard equipment.
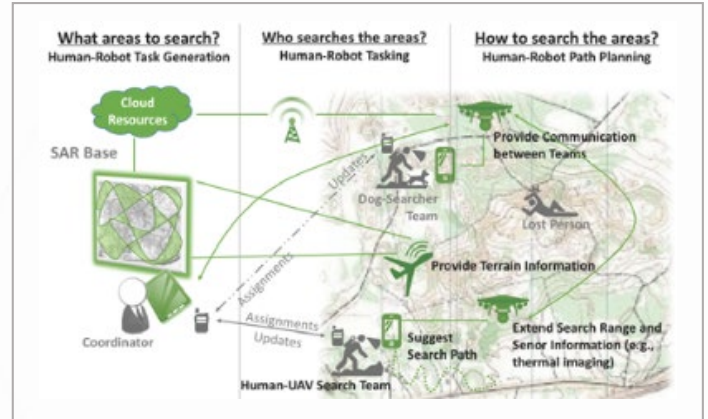
Human-robot collaboration in search and rescue.

The wearable computing backpack shown in a variety of outdoor environments.

CONTACT:

David Irvin
davidi86@vt.edu
540-231-7376