

Government

U.S. Deploys Unmanned Vehicles

Combat robots garner enthusiasm and skepticism.

In August 2009, the U.S. military announced that Taliban leader Baitullah Mehsud was killed by a missile fired from an unmanned aerial vehicle, or UAV. The CIA hailed the hit as a major success for U.S. attack-drone capabilities. According to the U.S. Air Force, the number of unmanned combat missions has increased 600% in the last six years. The U.S. military hopes to soon use drones for cargo transportation and refueling.

The Air Force and other agencies see enormous potential in the use of remotely controlled robots, perhaps with good reason. Unmanned vehicles could perform a wide variety of missions, according to Missy Cummings, director of the Humans and Automation Lab at MIT.

In fact, one day, soldiers guarding borders may see an army of remotely controlled robots rushing toward them. Cummings reports that “several” U.S. government agencies are

seriously considering how to use unmanned vehicles in first strike or initial invasion settings. She can picture a future beach assault situation similar to the U.S. invasion of Normandy, but with fewer human casualties. In the unmanned vehicle invasion scenario, “the UAVS do the initial strike; we send in robots on the beach and let the robots take the fire, and then set up a logistics camp so that Marines could go ashore.... The robots go in first, but they would always be in communication with humans.”

Cummings cautions that such unmanned vehicles wouldn’t necessarily perform missions better than would humans, but some missions are better suited for a robot. For instance, “I would rather send a bunch of robots to do a mine-sweeping mission, possibly with human oversight several miles away,” she told THE FUTURIST. “That’s one mission that could be more robot-driven than human-driven. In cases where what’s being searched for isn’t a mine but is



iROBOT

An iRobot remotely controlled “Small Unmanned Ground Vehicle” or SUGV robot in simulated patrol with U.S. soldiers. The company has received more than \$60 million to develop machines like the SUGV for the U.S. government.

instead a human victim, I would want a dismounted soldier working with the robot, walking through the field side by side."

In a 2007 paper titled "An Operator Taxonomy for Unmanned Aerial Vehicle Missions," Cummings and her co-authors lay out various tasks that drones might be able to perform in the near future. These include acquiring targets and rescuing people or soldiers from dangerous situations, collecting data from sensors to make better digital maps, dropping payloads or supplies for soldiers in discrete places, even assisting with cyberwarfare attacks.

Although Cummings is optimistic about the potential of unmanned technologies, she sees future progress fraught with failure and disappointment. Human commanders often harbor unrealistic hopes about the level of autonomy that drones and unmanned vehicles will be able to achieve.

"Parts of the military think of robots or unmanned vehicles and people as being mutually exclusive—it's either them or us," says Cummings. "The reality is, if we're ever truly going to move forward, it's going to have to be collaborative. How do the robots support us and take risks for us? What are the jobs they do better? There are a phenomenal number of jobs *humans* will always do better, at least during my lifetime."

Robotic systems may become adept at executing ever more complex and difficult commands, but they won't be capable of reasoning, nor will they demonstrate any real understanding of their environments or of their missions. They'll need considerable human guidance, and that fact will remain for a very long time, says Cummings. Engineers will have to design new unmanned systems with the pilot in mind as well as the mission. This, too, is a lesson many in the military still have to learn.

"We have a technological stampe for cool stuff," Cummings says. "All these agencies are racing to get the next cool technology out to market. They don't take into consideration human capabilities and how humans would work with these sys-

tems. They're not designing these machines from a human systems perspective; they're designing them from a technological perspective. So my forecast for the future is [that] we're going to see a lot of cool technology in various forms of research stages, but we'll also see a lot of failure, because many systems won't be designed with the human in mind. In the end, a system like that isn't

very useful."

—Patrick Tucker

Sources: "Unmanned Aircraft Take on Increased Importance" by Gerry J. Gilmore, American Forces Press Service, www.af.mil.

"An Operator Function Taxonomy for Unmanned Aerial Vehicle Missions" by C. Nehme, J.W. Crandall, and M.L. Cummings., 12th International Command and Control Research and Technology Symposium, Newport, Rhode Island, June 2007. Web site: <http://web.mit.edu/aeroastro/labs/halab/publications.shtml>.

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