

# Robot vehicles compete in \$2 million race

Red Team's Sandstorm is one of 20 robotic vehicles facing off in the DARPA Grand Challenge – a rugged race across the Nevada desert. The vehicles must negotiate a 175-mile course within 10 hours, using on-board computers, global positioning satellites, lasers, radar and inertial sensors

**GPS receiver:** Uses signals from up to four satellites to pinpoint vehicle's position on ultra-detailed electronic map

**Gimbal-mounted sensors:** Laser scanner and cameras – with 60 degree field of view – create image of ground ahead

**Main radar**

Sensors to detect obstacles in path of vehicle

**Multisensor system**

Short-range radar: 246ft

Long-range radar: 410ft

Forward scanning laser: 164ft

Supplemental lasers: 82ft

GPS/ inertial sensors

**E-Box:** All electronics housed in box floating on 12 shock absorbers

Shoulder-mounted terrain elevation sensors  
Left and right bumper-mounted sensors scan vertically to detect road edges

**Sandstorm:**  
1986 model  
Humvee fitted with  
6.5 litre turbodiesel

**Artificial Intelligence:** Combines data from sensors with e-map to determine best way ahead

Gearmotors translate AI's driving commands into actions