Unmanned Explosive Disposal

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Robots used by Explosive Ordinance Disposal (EOD) Specialists in the United States Army specialize in transport and detonation of unexploded ordinance, improvised explosive devices, and weapons of mass destruction. However, the US Army does not currently use robotics for disabling explosives, due to radio signals potentially setting off the explosives and a lack of dexterous ability on the part of the disposal unit. The goal of Unmanned Explosive Disposal was to construct an unmanned ground vehicle with a dexterous anthropomorphic robotic hand that could be remotely controlled via communication tether and flex sensors to mimic the natural movements of a human hand. This project would help Explosive Ordinance Disposal (EOD) specialists perform their duties in a safe and more efficient manner. Arduino microcontrollers, breadboard, and servo motors were repositioned on a newly constructed thermoplastic armature. A stepper motor was added to the robot armature to enable vertical arm movement. An entirely new set of controlling devices were constructed using a glove, flex sensors, DB9 tether cables, and an electronic game controller. Strength, dexterity, speed, and turn radius tests were performed and data collected. The robotic hand conclusively demonstrated improved dexterity and more precise vehicle maneuvers all without generating wireless signal noise.

Awards Won: