Project Simon: Development of an Advanced Telerobotic System

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The goal of Project Simon is to develop the world's most advanced telepresence robot. Telepresence is the use of virtual reality technology, especially for remote control of machinery or for apparent participation in distant events. There are many applications for developing a telerobotic system such as bomb defusal, rescue missions, security surveillance and many more. Achieving true telepresence is making sure that the robot can move like a human. The robot will have wireless communication between custom modules and itself. The modules will consist of many sensors of two types: accelerometers and flex sensors. The flex sensor will be used for less complex joints such as the elbow and fingers because they only bend in one direction. The accelerometers will be used for more complex joints such as the wrist, shoulders, and the head because not only do they bend in multiple directions, but they also rotate. The MPU6050 is a perfect module for achieving this task because it can detect six directions of motion which means the robot can have 6 degrees of freedom (DOF) per joint. The sensors for each arm will all be connected to custom modules that contain an RF module, and an Arduino which allows for all sensor data to be processed and transmitted to the robot which is equipped with a powerful microcontroller capable of processing all the sensor data and controlling multiple motors according to that data. The robot will be equipped with a first-person-view (FPV) camera that will transmit live video to a monitor in front of the user.

Awards Won: