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Fine Motor Skills Using Wireless Animatronics

In my project I made a wireless animatronic hand guided by code based in C and tested it to see how my hand related to the hand I created. The main aspect was the wireless application. Because the hand is wireless it opens a huge array of applications from military to medical. Both the animatronic hand and the control glove have an Xbee radio to send and receive the data. The hand itself is powered by a microcontroller and moved by 5 hobby servos. The control glove has 5 flex sensors and a microcontroller to power the glove. Each sensor measures the angle of my finger and sends it to the radio. The receiving radio takes the data and sends the corresponding servo to the correct position. I recorded the hand in use at 1080p at 60 frames per second to get high resolution stills. I measured each finger angle at three different positions, fully extended, half extended and unextended, for both my hand and the animatronic hand. I found that overall the animatronic hand was most accurate at the half extended position with about 10° of difference. It was least accurate at the unextended position with about 30° of difference. Overall the thumb was the most consistent finger at about 10° of difference at each position. There have been other projects like this but they are either lacking the wireless application or need the use of a computer to operate.