Control of Prosthetic Devices Using Interactive RFID Tags

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Most prosthetic devices do not use computer-enabled mechanical components. The most advanced prototype systems, currently under development, seek to create neuro-mechanical interfaces. These approaches rely on the concept of primary "human control". The problem is that many complex movements are unconscious or “Zombie” programs running in different parts of the brain. In other words, a person does not have to consciously think about them. This project enables the "environment" to allow a prosthetic device to control itself, thereby “off loading” enormous amounts of neural control processing while permitting the device to autonomously perform complex movements and tasks. The Arduino-Uno embedded system controls an RFID sensor and servo actuators within a 3-D printed prosthetic hand. An RFID antenna is in the palm of the 3-D printed prosthetic hand. This allows the prosthetic device to read different RFID tags on objects in the environment. Each tag may be associated with a different set of functions which would determine the movement of individual servo motors. This gives the prosthetic device the ability to execute different complex movements depending on which RFID tag is read by the antenna. In the future additional sensors within the 3-D printed prosthetic hand can be used to expand innate human capabilities. This might even include data loggers to "remember" the life experience of the prosthetic device and a broad range of unique sensors.

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