Stroke Rehabilitation Biometry Device

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Research

Title: Stroke Rehabilitation Biometry Device

Stroke rehabilitation methods often rely on qualitative data obtained from medical professionals' observations. Recent advances in technology use various computer programs for therapy, biometry, sports performance optimization, and other human performance assessments. Our proposed system uses flex sensors and Inertial Measurement Units (IMUs) to provide accurate biometric measurements of finger, wrist, elbow, and shoulder positioning for use in assessing stroke rehabilitation progress. Sensor data is processed by a mounted, wearable Arduino and sent via USB cable to a PC running MATLAB software. MATlLAB is used to represent the joint movements graphically. This device is proposed for use in clinical settings in concurrence with traditional qualitative evaluations such as the Wolf Motor Function test.

Figure: Prototype biometry device

Lesson Plan

Title: Using a Microcontroller to Model Biological Principles

Students construct an experimental unit using a temperature sensor, LEDs, and Arduino microcontroller. They write Arduino program to instruct the LEDs to turn on as the sensor

detects a certain temperature range (code basics are provided to them but the students must determine the appropriate range given their setting). When that range is exceeded, the LEDs turn off. In this way, the principle of homeostasis is demonstrated. Students then write a summary paragraph relating the sensor unit to homeostasis.

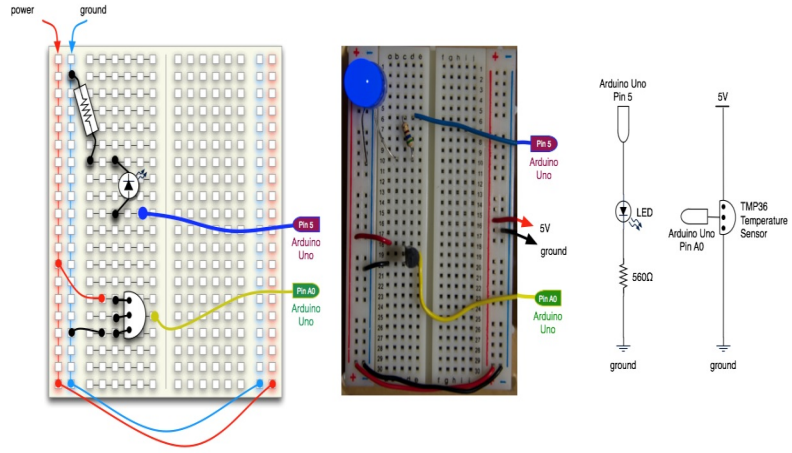

Figure: Prototype system to model homeostasis