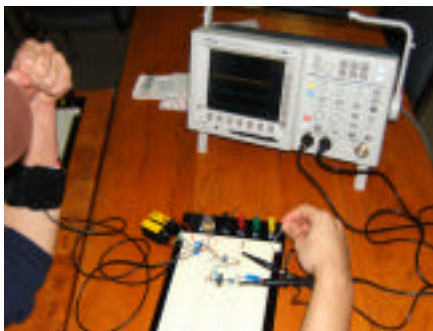


# Versatile Microcontroller Algorithms Using Myoelectric Control

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Losing finite motor control used to be a sentence to a sedentary lifestyle. Diseases such as Muscular Dystrophy or traumatic injuries to the nervous system can leave victims with the ability to sometimes perform only the most basic of movements. Luckily for them, research is now finding ways to exploit even the smallest amount of muscle functions to do tasks that otherwise would have been completely ruled out.



Our research stems from the previous research of Eugene Chabot, John DiCecco and Dr. Ying Sun on the Cricket Car project. They were able to successfully interface a cricket with a remote controlled car, and implemented algorithms from it's muscle impulses that allowed for the cricket to actually drive the car.

Our contribution to this project addresses the following issues:

1. There is more need for human-machine interfaced devices than cricket based.
2. The original circuit and algorithms needed refinement to allow for greater versatility.
3. The value of a simple but effective algorithm for human-machine interface is invaluable to the field of assistive technology.

Our project is divided into four parts:

1. EMG Capture- The raw signal is sensed by the electrodes and sent to the capture circuit.
2. The signal is sent through several stages of amplification and filtering. It is then converted from an analog signal to digital.
3. Digital signal is sent into the PIC 18F452 Processor, where the algorithm Nikola has been developing determines the action.
4. Final stage the signal from the PIC 18F452 tells the remote control to send the appropriate signal to the RC car.

The RC car is just the beginning of this project. It is an easy device to control, and once we develop an efficient algorithm we can further the project by implementing it to other devices such as motorized wheelchairs and hospital beds. From there, a successful algorithm can be used to control a wide range of devices that are based on similar controls as the ones we are, and hope to be experimenting with.

Sources:

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- <http://www.univie.ac.at/cga/courses/BE513/EMG/>
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