College of Engineering
Department of Mechanical & Industrial Engineering

College of Engineering
School of Electrical Engineering & Computer Science

To Predict ▶ To Design ▶ To Perform

ME, ECE Capstone Design Programs

Robotic Guitar Interface Device-Rehabilitation and Research Guitar Bot (RRGB

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LSU School of Kinesiology

Objective Statement

The RRGB will be designed primarily as a research apparatus for the Louisiana State University Kinesiology Department that will enable stroke victims to undergo an experimental rehabilitation technique that combines rhythmic and discrete movements while playing guitar.

Engineering Specifications

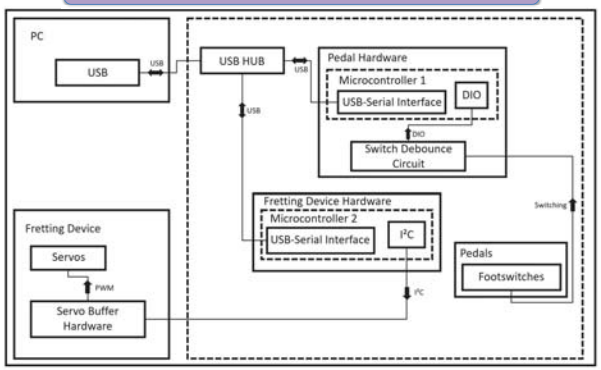
Functions:

- Actuates chords on first four frets of guitar
- Foot pedal controls
- Computer-Based user interface for device configuration
- Scrolling Timing Indicator on Computer Interface

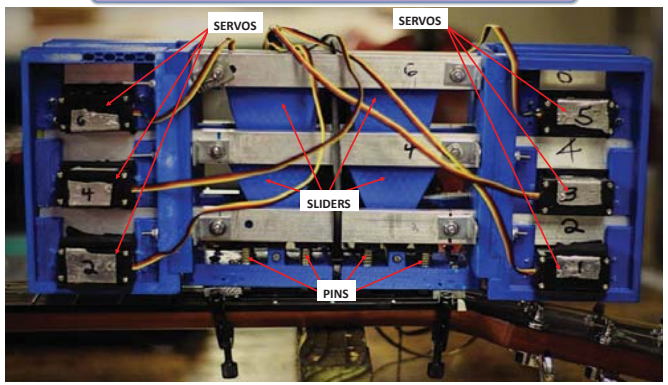
Constraints/Measurable Specifications:

- Attachable/Detachable
- PC compatible user interface
- Two modes of operation
- Four foot pedals
- Less than 500ms actuation delay

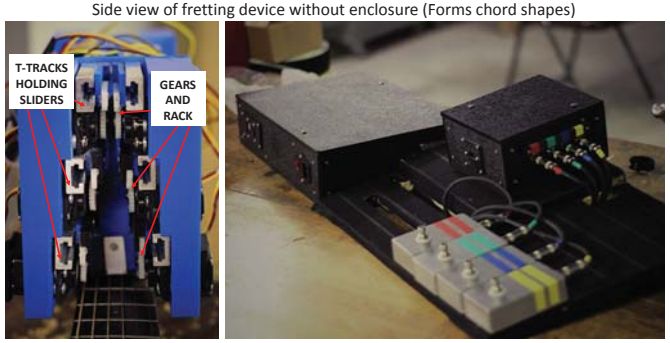
Electronic Hardware Schematic



Prototype



Side view of fretting device without enclosure (Forms chord shapes)

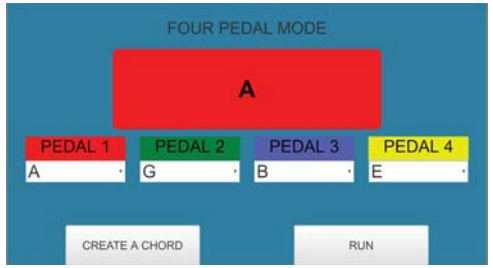


Back view of fretting device (left). Power supply along with pedals and pedal board (right).

Safety Considerations

- Moving and electrical components will be enclosed to prevent injury
- All electronics will be capable of handling currents that meet or exceed the range required for normal operation of the device.

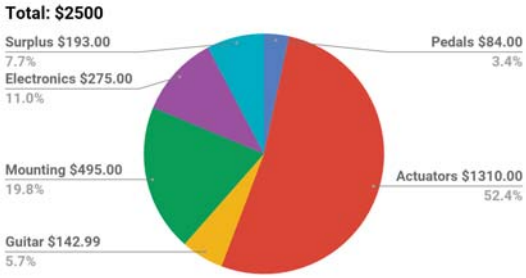
User Interface and Pedal Board



Four Pedal Mode page from the User Interface.

Device pedal hardware (Controls Actuation of Chords)

Budget



September
- Force Testing
- Response Delay

October
- GUI Layout
- Preliminary Design Choices
- Choose Parts

November
- Embodiment Report
- Prototype Drawings

December
- Prototype Final Report
- Part Purchasing

January
- GUI Coding
- Device Construction

February
- Skeletal GUI Completed
- Initial Testing

March
- GUI-Device Integration
- Device Testing

April
- Final Device and GUI Complete

Sponsors: Dr. Nikita Kuznetsov and Dr. Hunter Gilbert

Adviser: Dr. Jerry Trahan