

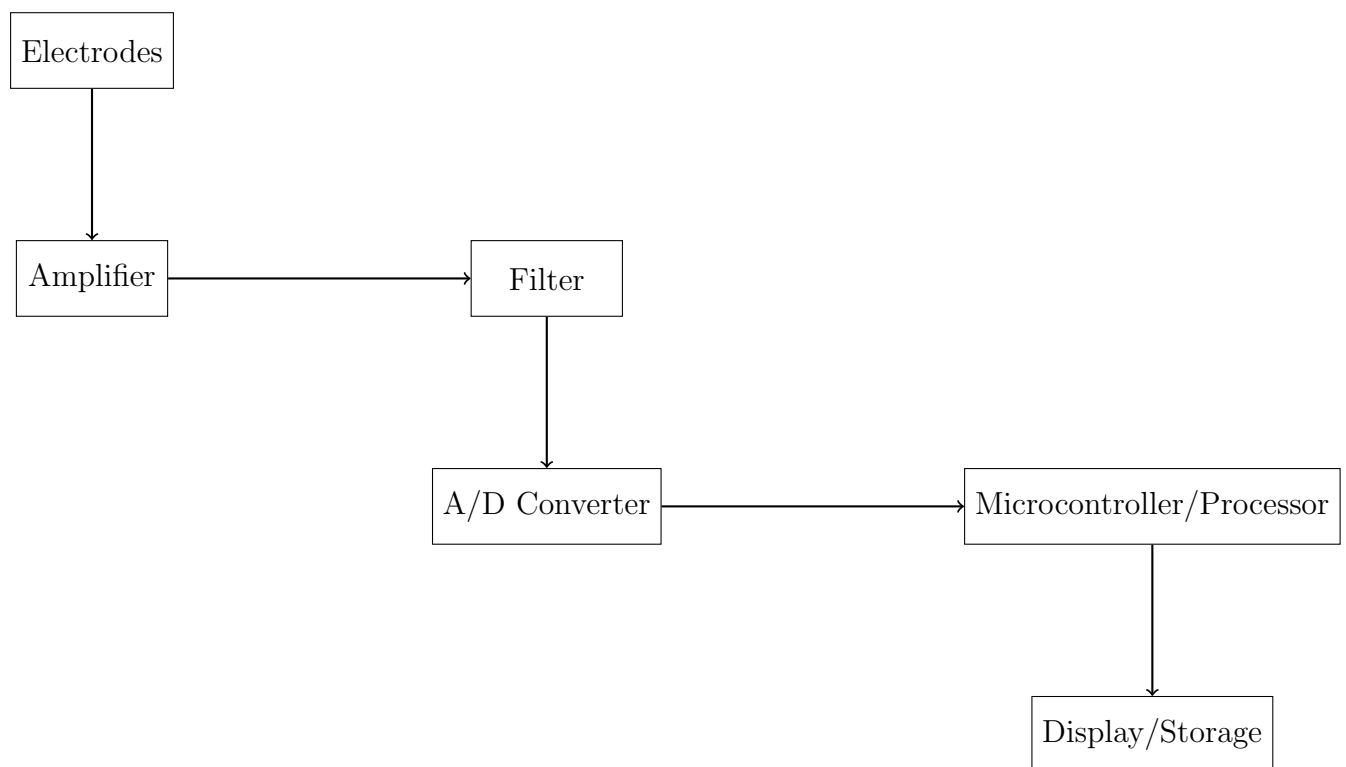
Feasibility Report for EMG Analog Project

Group Name: STEM Project

1 Functionality

The goal of this project is to design and implement an analog EMG (Electromyography) system. The system will measure the electrical activity produced by skeletal muscles, which can be used for various applications such as medical diagnostics, rehabilitation, and human-computer interaction. The system will consist of sensors to detect muscle signals, amplification circuits, filters to remove noise, and a display unit to show the processed signals.

2 Block Diagram of the System



3 Methodology

We will begin by researching and selecting appropriate electrodes for muscle signal detection. Next, we will design and build an analog circuit to amplify and filter the signals. The circuit will be tested using simulated muscle signals to ensure proper functionality.

Once the signals are processed, we will output them to a display unit. The project will be developed iteratively, allowing for adjustments based on testing results.

4 Micro-products and Interconnections

The system will be composed of the following micro-products:

- **Electrodes:** Detect muscle activity and send signals to the amplifier.
- **Amplifier:** Increases the amplitude of the weak EMG signals.
- **Filters:** Remove noise and interference from the amplified signals.
- **ADC:** Converts the processed analog signals to digital form (optional based on final design).
- **Display Unit:** Outputs the final signal to be viewed.

The connections between these micro-products will be established using standard electrical wiring and interfaces. The signals from the electrodes will be fed into the amplifier, then passed through the filter. If digitization is required, the signals will be converted using an ADC before being sent to the display unit.

5 Micro-product Allocation

- **Sivamynthan.N 220619D:** Responsible for the design and testing of the amplification circuit.
- **Ananthakumar.T 220029T:** Handles the selection and integration of the electrodes and filters.
- **Ahilakumaran.T 220017F:** Enclosure designing
- **Mathujan.S 220389U:** PCB designing

6 References

- Article on EMG Signal Analysis: A Review by M. R. De Luca
- Article on Filter Design and Implementation for EMG Signals: A Review by M. S. Obaidat and A. M. Abu-Qasmieh