

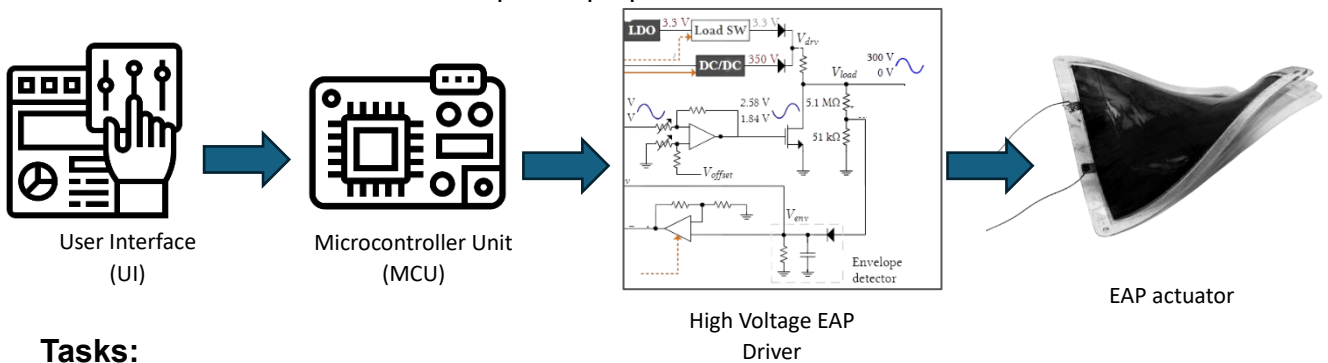
SS2024

Programmable High Voltage EAP Driver

Project type: Hardware Software Hardware/Software Simulation Modelling

Project description:

Ever wondered how your phone vibrates or how VR controllers create realistic sensations? These effects are achieved using tiny motors that spin very fast. However, there is another technology that can achieve similar effects: Electroactive Polymers (EAPs), also known as artificial muscles. EAPs are soft and flexible materials that can contract and bend when stimulated with electricity. This makes them similar to real muscles and here we will mimic the role of a neural control system by designing an embedded system that generates electrical signals to regulate the behavior of an EAP actuator. This project aims to design and build an embedded system that generates user-selectable voltage and frequency signals to drive a high voltage EAP actuator. The system should allow for precise control over the EAP's stimulation for research and development purposes.



Tasks:

1. Research and Design
 - Select appropriate component
 - Design the circuit schematic and simulate it (e.g., LTSpice)
2. Assemble the hardware components on a PCB
3. Write code for the microcontroller to read user input (voltage & frequency) and generate control signals
4. System Integration and Testing
5. Documentation: Report and presentation

Competences:

- Basic knowledge of electronics and circuit design (LTSpice)
- Familiarity with microcontrollers and programming (e.g., Arduino C++)
- Ability to work with and interpret schematics
- Self-learning ability, creative thinking and motivation to work independently

Contact:

Dipl.-Ing Ahmed Attaoui

Chair of Measurement and Sensor Technology
 E-mail: ahmed.attaoui@etit.tu-chemnitz.de