TEXAS STATE
INGRAM SCHOOL OF ENGINEERING

# E1.05 - Flextivity

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TXST Sponsor: Dr. Maggie Chen

FLEX TIVITY

## Project Overview

Our project is a bending apparatus that characterizes mechanical and electrical properties of conductive materials, to aid in the production of flexible electronics. Cyclic bending will aid in determining device sustainability while resistivity/conductivity measurements will aid in performance analysis.

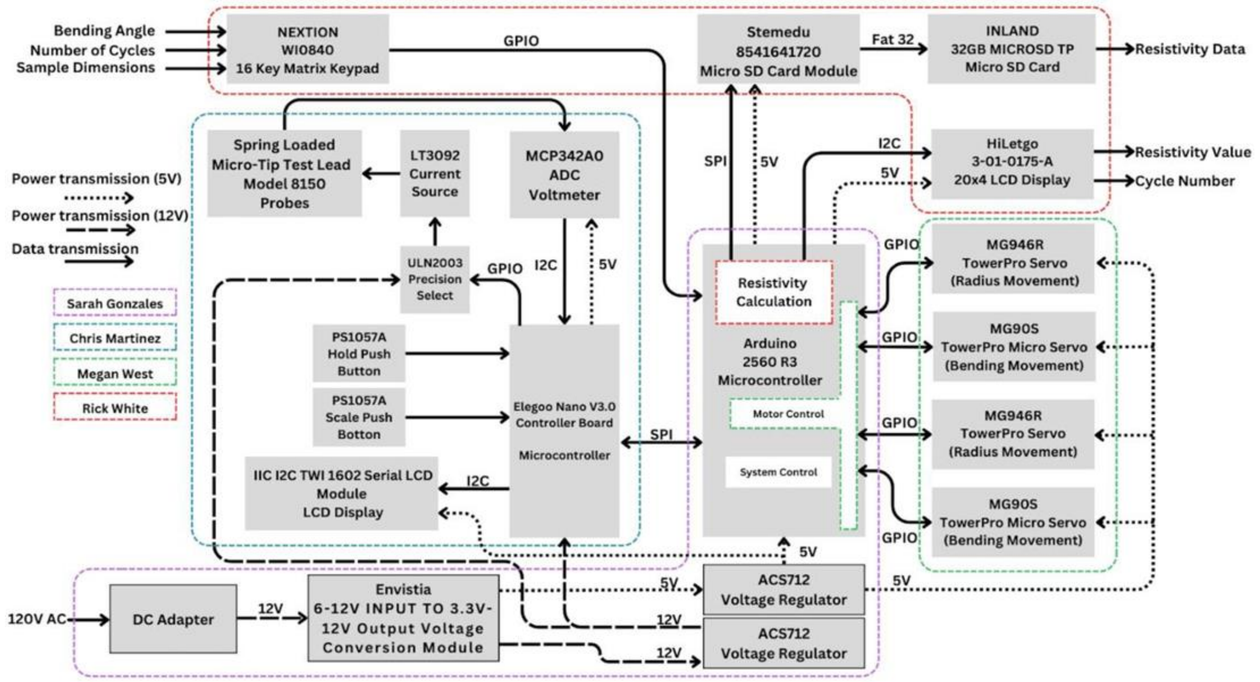
## Requirements

- Design an automatic bending tool that can control the bending angles and number of cycles.
- Additional function – can measure the conductivity in real time and store the angle/cycle versus conductivity data

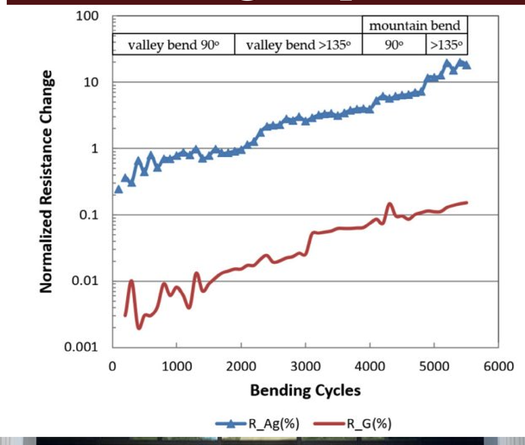
## Features

- 0° to 180° degree tension and compression bending.
- 4-Point Probe resistance Measurements
- Resistivity/conductivity calculations
- Accepts user inputs and displays real time data to user interface.
- Stores data on micro-USB for external data analysis

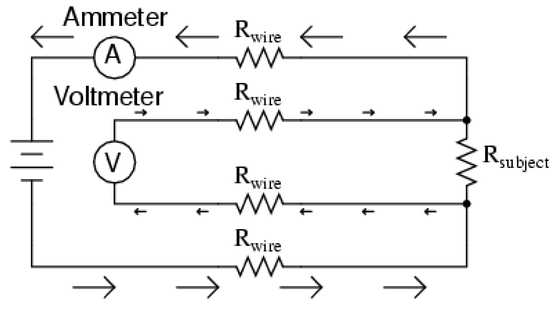
## Top Level Block Diagram

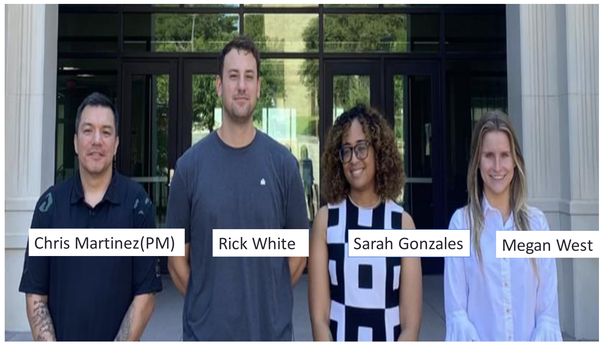


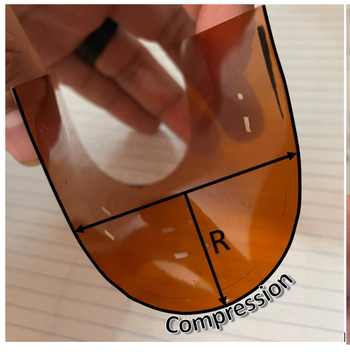

## Bending Properties

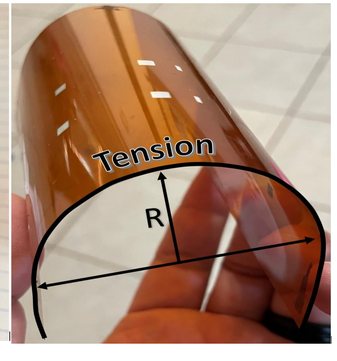



## Ohm Meter Schematic




## Current Progress

- ✓ User Interface accepts user input and displays sample data
- ✓ Bending operations perform tension and compression motions
- ✓ Probes sense resistance measurements

## D2 Project Goals

- Design PCB for system integration
- Design probe calibration to increase accuracy
- Optimize bending parameters to Increase bending angle precision
- Display and store live real time data

## Spending per Subsystem

| | |
|---|---|
| **Bending** | $ 39.18 |
| **UI & Data Processing** | $ 26.15 |
| **Power** | $ 54.79 |
| **Probes** | $ 113.80 |
| **Total Spent:** | **$ 233.92** |

## Acknowledgements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- TX State Faculty: Mr. Mark Welker