



# Rochester Institute of Technology

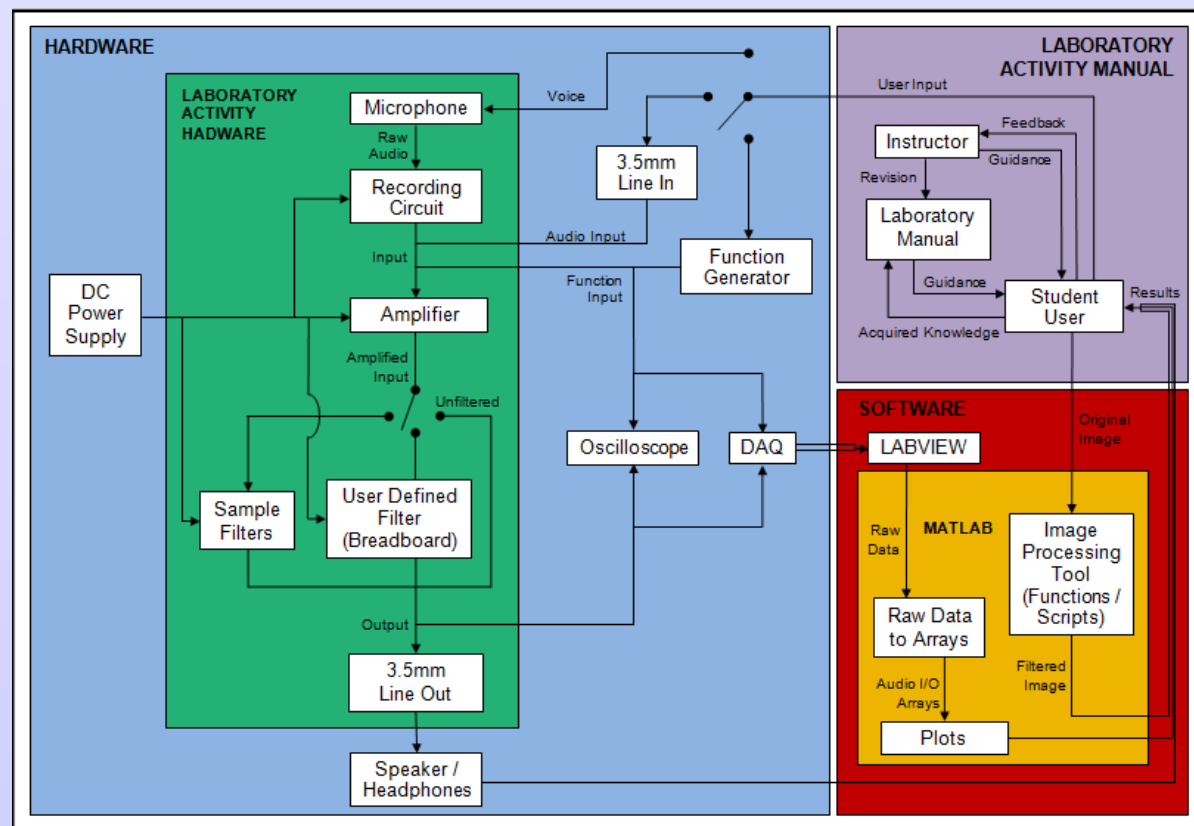
Multi-Disciplinary Senior Design Center

## System Dynamics Filtering Laboratory

P13361: SYSTEM TECH VISUALIZATION



### Project Overview: Systems Architecture

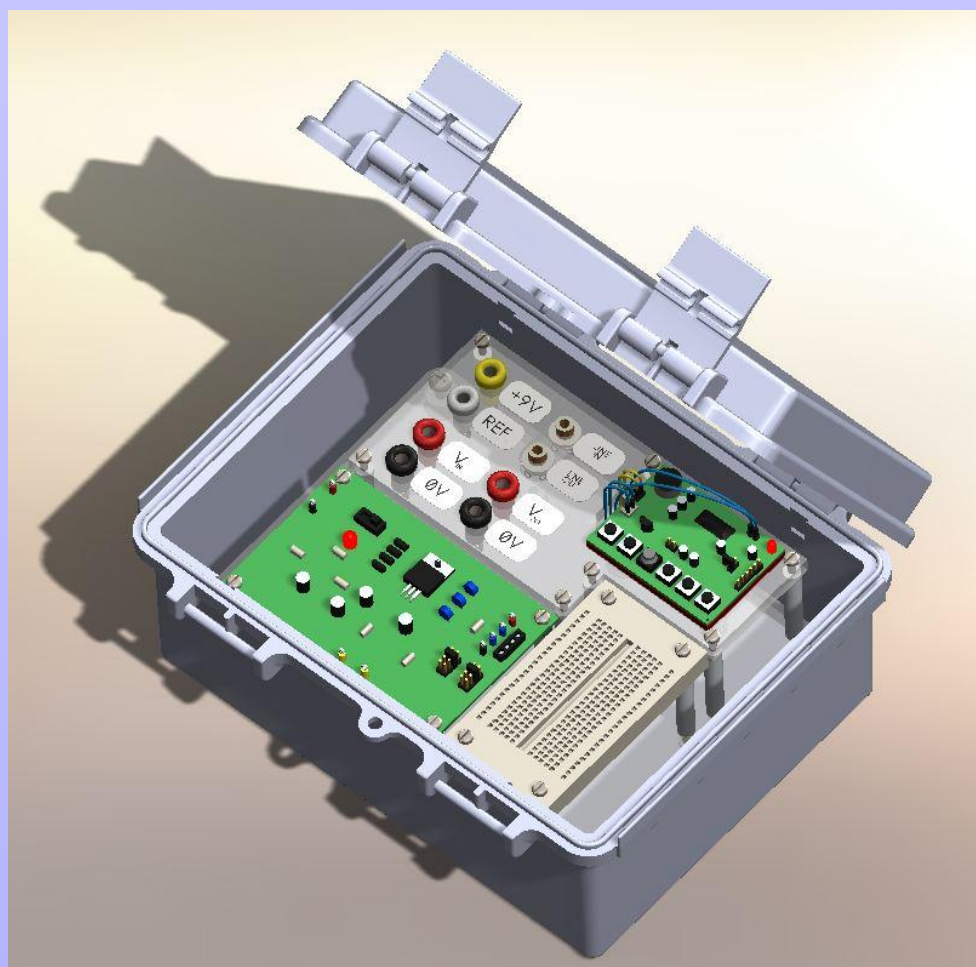


**Key Objective** - Develop a Laboratory Exercise that demonstrates the concepts of filters in engineering and industrial applications

\*Must provide both hardware (electrical and mechanical) and software (MATLAB) components for use in the Studio Electronics laboratory

\*Must be informative and engaging, as well as accessible to 3<sup>rd</sup> year Mechanical Engineering students

### Proposed Hardware Design Solution



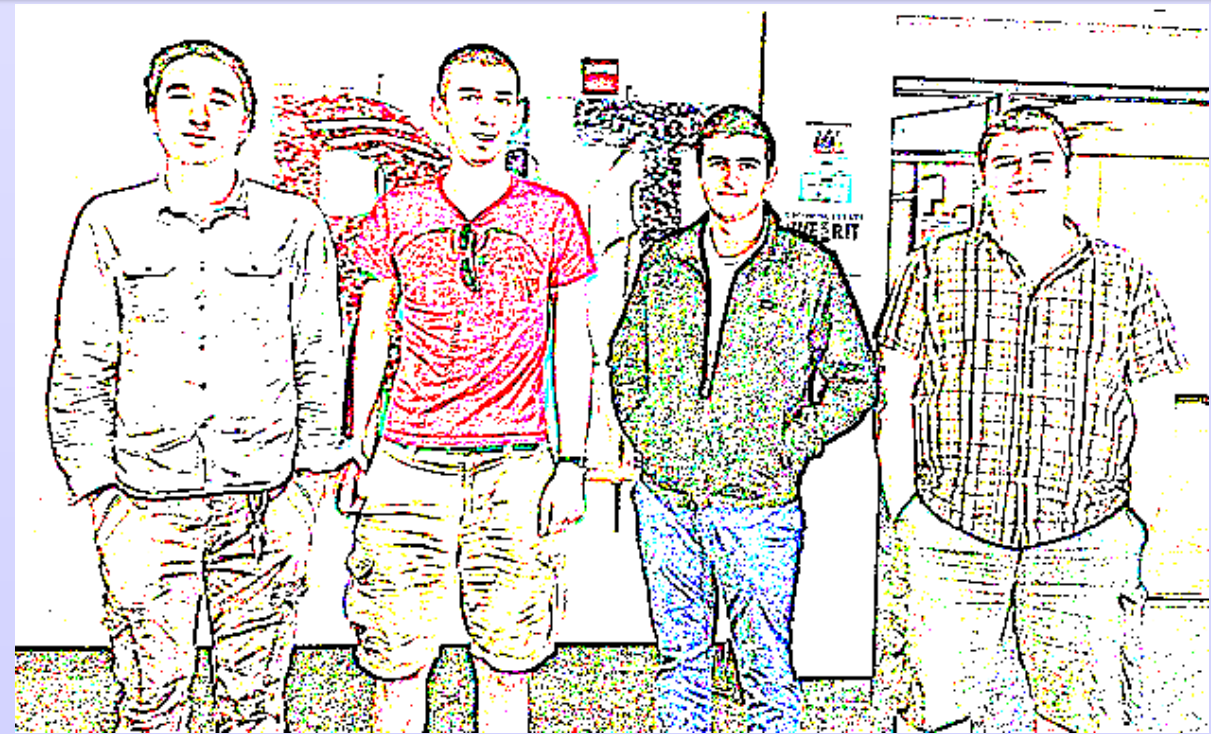
- The mechanical and electrical components comprise the main deliverable and fulfill the need for an interactive piece of hardware to complement learning.
- The hardware assembly includes 5 major components; the case and mounting solution, the interface panel, the printed circuit board, the ISD recording circuit, and the breadboard.

### Project Completion

**Deliverables**- Lab manual, operations manual, assembly manual, hardware kit, software kit, verification test procedure/results

**Suggestions**- Filter PCB values can be tweaked to complement single-tone generation, additional software filters can be implemented with included skeleton filter, and side covers to protect the interior could be added.

### People



Design Team (from left):

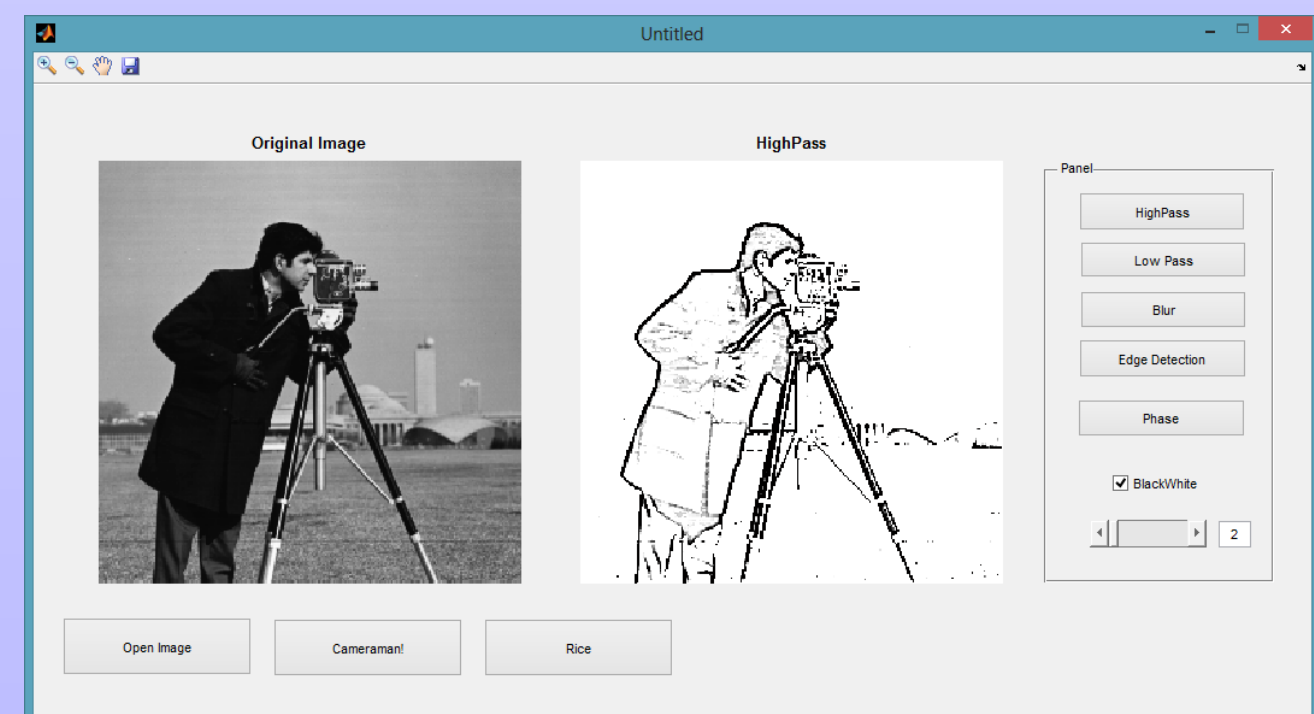
Bardia Ghajari (EE), Ryan Hare (EE), Francisco Saravia (EE) Ethan Flöw (ME)

Faculty Guides: Leo Farnand, Vince Burolla

Customer: Mechanical Engineering (Mark Kempfski, Kathleen Lamkin-Kennard)

Acknowledgements: Peter Goebel, Vincent Amuso, Sohail Dianat

### Software Graphical User Interface (GUI)



-The software deliverables consist of several M files that operate a GUI that includes multiple filtering options and associated image sizing and process functions to allow for flexibility of input options.

-The GUI is simple to use and can easily provide filtered outputs to compare to given inputs and allows for an intuitive approach to explore the various methods of image processing.

### Final Implemented Hardware Solution

