THE UNIVERSITY OF ALABAMA IN HUNTSVILLE

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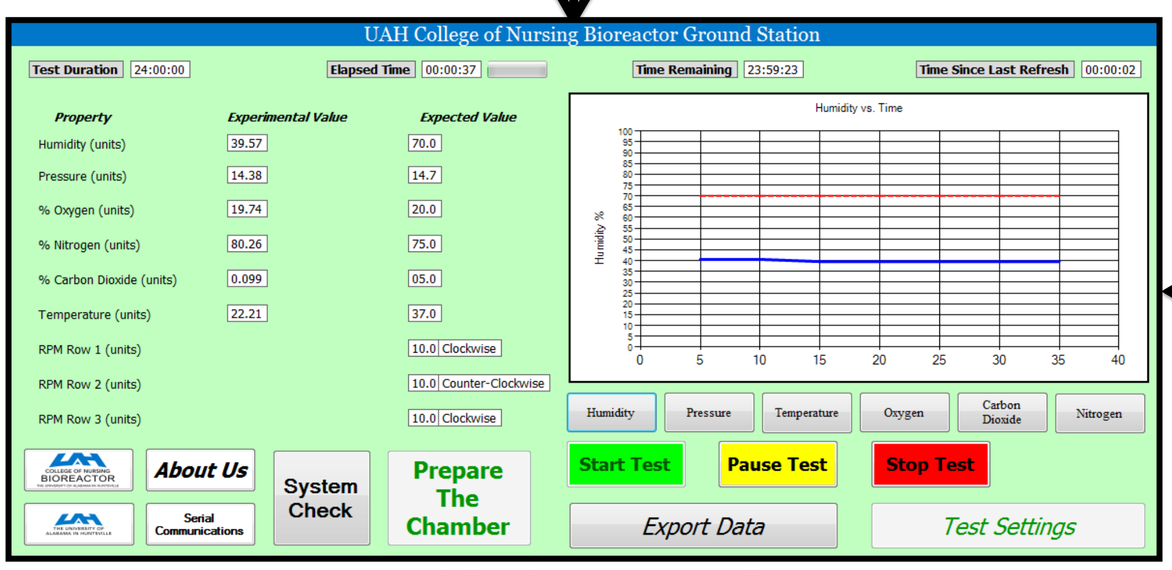
# The Research, Design and Implementation of a Remotely Operated Bioreactor with Incubation System for the Purpose of a 3D Cell Line Growth

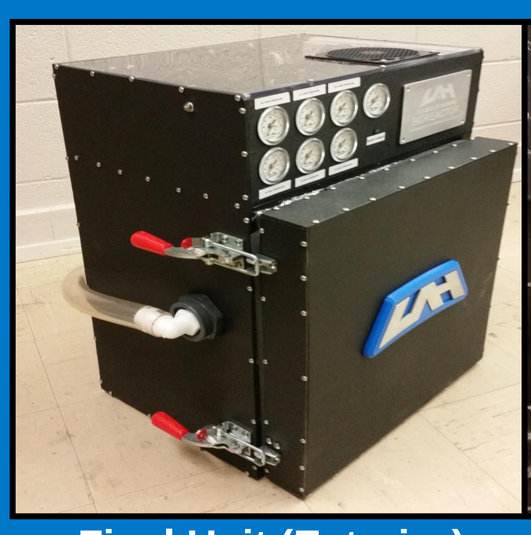
*Steven Doyle, John Helms, Ryan Longchamps & Dr. Azita Amiri*
*Department of Mechanical & Aerospace Engineering*
*College of Nursing*

**User Input**



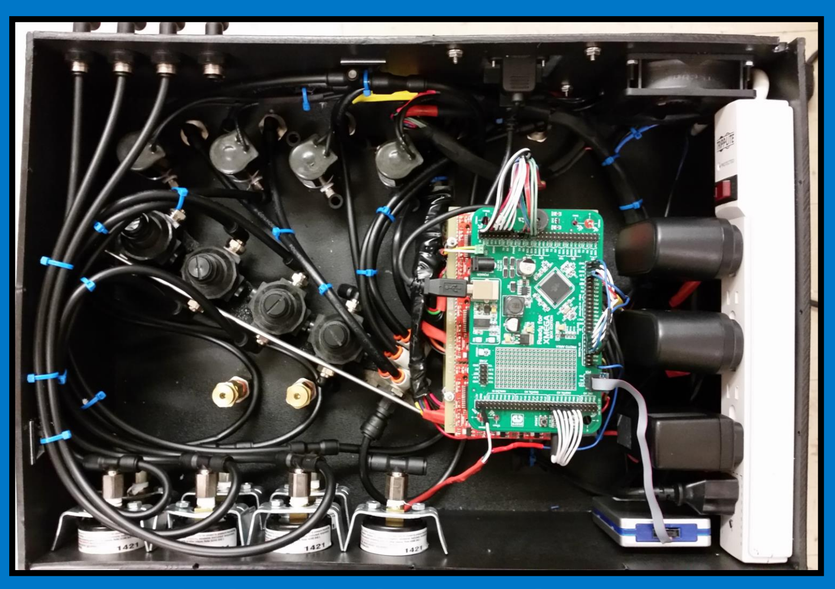

**Graphical User Interface**

**Set Point Data**



**Final Unit (Exterior)**

**Final Unit (Interior)**



**Gas and Electrical Control Components**

**System Status Feedback to User**

## Overview

- Integration of independent components from current systems: tumbler and incubator
- Reduced culture settling due to gravitational force
- Chemical testing is more accurate due to 3D culture properties

## Impact

- Cost effective alternative design with system integration and remote operation controls
- Test platform capable of handling various experimental conditions
- Reduced error in experimental process as a result of minimal handling

## Key Findings

- System performs in accordance with the approximate thermal analysis
- Configuration ensures minimal error through simultaneous triplicate testing
- Next generation design will need to be condensed through custom circuit boards

## Explanation

- An effective ground model represents a strong movement forward to developing a space ready version capable of enduring the flight to space and its harsh conditions.
- Further testing with three dimensional growths offers an unmatched potential for biomedical science breakthroughs.

## Acknowledgements

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