Medical Need
- Neonatal Brachial Plexus Palsy (NBPP) affects 1 to 4 per 1000 births
- Leads to overstretching and/or avulsion of the BP nerves
- Biomechanical injury mechanism is poorly understood

Project Goal
Develop a biomechanical device to cause in vivo external neck stretch that will lead to BP injury in neonatal piglets

Solution
- Actuator
- Load Cell
- Sliding Platform
- Swivel Joint
- Head Stabilizer

Approach
- Measure Traction Force (load cell)
- Control magnitude and rate of linear distraction (actuator)
- Control lateral bending angle of the neck (swivel joint)

Note: Our device will replicate force and lateral bending on a piglet model

Results - Verification Testing

<table>
<thead>
<tr>
<th>Test</th>
<th>Average % Error</th>
</tr>
</thead>
<tbody>
<tr>
<td>Known Weight vs. Measured Weight</td>
<td>5.20</td>
</tr>
<tr>
<td>Input Displacement vs. Measured Displacement</td>
<td>0.342</td>
</tr>
<tr>
<td>Input Displacement Rate vs. Measured Displacement Rate</td>
<td>1.72</td>
</tr>
</tbody>
</table>

Future Plan
- Develop fastening system
- Solder the wires on the circuit board

Impact
- With the development of this device, clinicians will understand more about the mechanisms and biomechanical properties of BP injury