3 Point Bending Device

Group: Michael Harman, Xuan Nguyen, and Eric Sirois
4/9/09 Presentation by Mike Harman
Project Overview

- **Construct a three-point bending device**
  - Capable of performing flexure testing on soft tissues
  - Capable of calculating the flexure rigidity, bending stiffness, transmural strain, transverse shear stiffness

- **3 Principle goals**
  1. Measure the stress-strain response in the low-strain region (<5%) by evaluating the instantaneous effective modulus, (E)
  2. Identify the location of the neutral axis
  3. Provide a suitable environment for testing (temperature, pH) such that data are relevant and repeatable
Completed Work

• Mike
  – Camera mount construction
  – Bending bar mount attachment
  – All hardware for the temperature control loop is on hand
Camera Mount
Bending Bar Attachment
Completed Work

• Xuan
  – Labview front panel for image processing module
  – Image processing and marker tracking code
Image Processing Front Panel
Completed Work

• Eric
  – Converted programs to input only functionality
  – Successfully implemented flexural rigidity Matlab code in Labview
  – In the process of converting the transmural strain code
Matlab -> Labview

• Hang-ups:
  – Mathscript and Matlab Script do not allow use of nested functions
  – Data cannot be processed in 3-D matrices

• Solution:
  – Eric rewired the program accordingly to account for these discrepancies
  – The program output is verified against the pilot test results
Hang-ups

• Need to purchase mounting table for entire device
  – Size dramatically increases price and we must find a cost effective balance
  – Will consider using plywood board for attachment
Future Work (1 Week)

- This week, we intend to:
  - Successfully integrate transmural strain code in Labview- Eric
  - Wire the heater/ thermostat and integrate the temperature control loop – Mike
  - Transmural point tracking – Xuan
Future Work (2 Weeks)

- User operation manual—Mike
- Final report—Xuan
- System calibration and troubleshooting—Eric
## Hours Worked

<table>
<thead>
<tr>
<th>Name</th>
<th>Total Hours</th>
</tr>
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<tbody>
<tr>
<td>Michael Harman</td>
<td>15</td>
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<tr>
<td>Xuan Nguyen</td>
<td>11</td>
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<tr>
<td>Eric Sirois</td>
<td>18</td>
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Questions?