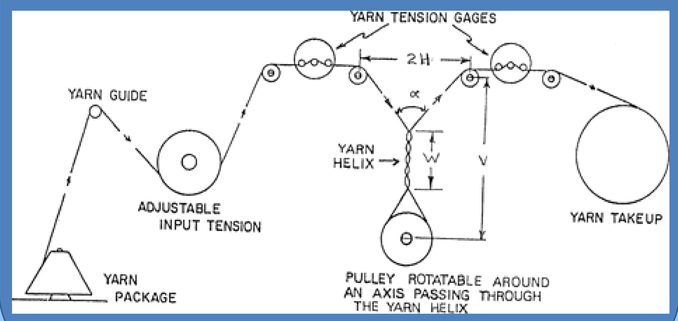
In-Situ Friction Analysis Between Reinforced Fibers

Problem Statement

- Design and build a mechanism capable of measuring friction forces between polymeric fibers
- Update current model of testing (ASTM Test Method D3412) for use in scanning electron microscope

Proposed Design



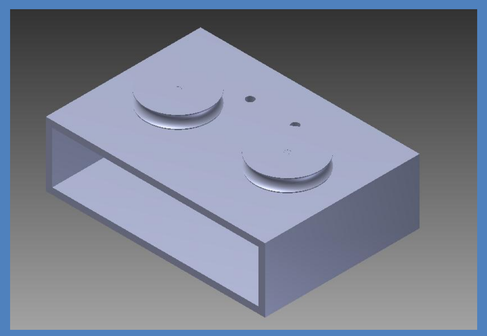
Design Objectives

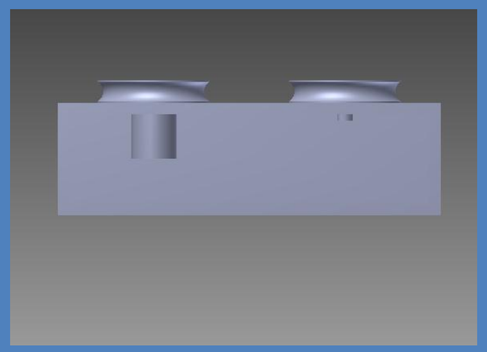
- Must fit in space of dimensions 170mm x 120mm x 50mm
- Motor should pick up between 1 and 4 inches of yarn per minute
- Requires input tension device
- Must be vacuum-friendly and SEM compatible

Motivation

- Understanding friction analysis on the nano scale
- Evaluating and enhancing materials
- Modernizing and reforming the testing standard

Model

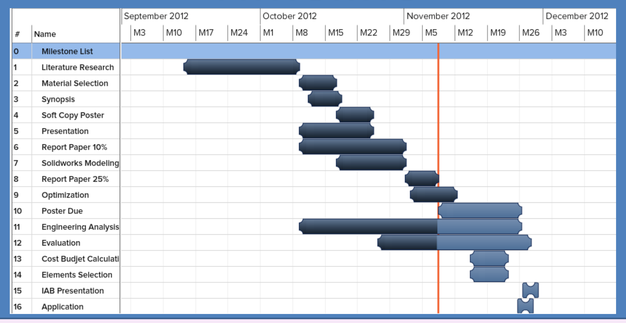




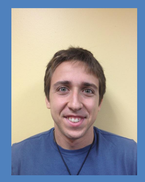
Prototyping and Testing

- Solidworks modeling and motion analysis of prototype
- Construction and testing of prototype under working conditions
- SEM integration

Timeline



Team Members



Eduardo Escobar

Jean Paul Arroyo

Advisor: Dr. Benjamin Boesl