

Senior Design Project Data Sheet

Project #	Project Name	Project Track	Project Family
P09023	Air Muscle Artificial Limb	Assistive Devices and Bioengineering	Artificial Organ Engineering
Start Term	Team Guide	Project Sponsor	Doc. Revision
Fall 2008	Dr. Lamkin-Kennard	Dr. Lamkin-Kennard	

Project Description

Project Background:

This is a second generation project aimed at developing a scalable robotic hand. The first generation created three fingers with complete range of motion. The hand could be scaled down for microsurgery, and it could also be scaled up for deep sea maintenance applications.

Problem Statement:

The primary objective of this project is to improve upon the first generation of an anatomically accurate robotic hand. The mechanical design and the controls system should accurately imitate motions of the human hand and the design should be robust and easy to use.

Objectives/Scope:

1. Gain understanding of past project
2. Make current design more robust
3. Update controls scheme
4. Determine joint/muscle attachment methods
5. Implement Design

Deliverables:

- Hand that exhibits all directions of freedom of a human hand
- Optimized control algorithm

Expected Project Benefits:

- Reinforcing the biomechanical program at RIT.
- Hand will be a great teaching tool.
- Basis for future senior designs
- Recruiting tool
- Benefits in prosthetics field
- Possibility of wireless surgery

Core Team Members:

- Jim Breunig – Project Manager
- Kelly Scarbrough
- Alexandra Bird
- Eva Ames
- Thomas Keane
- Chris Music

Strategy & Approach

Assumptions & Constraints:

The team's first task will be to research the anatomy of a human hand and become familiar with what has already been done with the first generation project. The team will then begin optimizing the current design and adding a pinky thumb and palm. The main constraint is to develop a hand with all directions of freedom of a human hand with the specified budget of \$2000.

Issues & Risks:

Not all DOF in final design

Not scalable

Fragile

Unable to get prototypes completed on time

Unexpected long lead times

Project goes over budget