Product Design Specifications:
Computer Input Device for Individual with Muscular Dystrophy

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Team Leader: Nathan Werbeckes
Communicator: Vincent Mi
BSAC: Kuya Takami
BWIG: Hyungjin Kim

Function: The goal of the project is to minimize the setup time and improve the usability of the computer input device currently used by the client. Our focus will be replacing the trackball mouse control device with something more suited to his limited motor control. We will also provide wrist and forearm support which can be easily set-up and adjustable.

Client requirements:

- more accessible mouse control device
- Wrist and forearm support
- Comfortable forearm support
- Quick set-up time
- Adjustable

Design requirements:

- Must be able to connect with a normal home computer (probably via USB)
- Easy to set-up without confusing components
- Should be able to reach entire monitor with 1cm of movement he has
- Finger posture on buttons must be maintained with minimal effort
- Should not chafe skin

1. Physical and Operational Characteristics
a. *Performance requirements*: Client must be able to easily have full input control of the computer. Mostly regarding the movement and clicking of the mouse with the

limited motion in his hands. He prefers to use his left hand for clicking; however, we are considering different methods of selecting such as a tapping pad. He has more control in his right hand so we will continue to use that for cursor movement. He can control his thumb, pointer and middle fingers on both hands reasonably well. Wrist and forearm movement is non-existent.

b. *Safety:* Wrist and forearm supports must not cause rough contact or chafing against his skin. Forearm support should be stable and not tip over in any use.

c. *Accuracy and Reliability*: Sensitivity of cursor control device must be maintained over time because of the small range of motion.

d. *Life in Service*: Service should be minimal since device is assumed to be basically permanent. Device would be used for multiple hours daily.

e. *Shelf Life*: Not applicable. Device is used daily; storage conditions are same as usage conditions.

f. *Operating Environment*: Normal room temperature, maybe a bit hotter and more humid than most. Corn syrup in environment may affect moving parts.

g. *Ergonomics*: Device must conform precisely to client's physical capabilities. This includes operating position, padding for comfort, and wrist and forearm support.

h. *Size*: Product must fit client's hand and arms, and fit on his computer desk.

i. *Weight*: No explicit requirements; should be easily handled and supported by the desk.

j. *Materials*: Arm and wrist supports must not wear on his very sensitive skin.

k. *Aesthetics*, *Appearance, and Finish*: Appearance and colors negligible, finish should be for comfortable extended use.

2. Production Characteristics
a. *Quantity*: one.
b. *Target Product Cost*: $500

3. Miscellaneous
a. *Standards and Specifications*: None.

b. *Customer*: Prefers right hand use for movement control. Tactile feedback preferred.

c. *Patient-related concerns*: Skin sensitivity must be considered. He prefers movement to be operated by his right hand. He is not able to lift his arms and wrists so they must be supported at the proper angles to use the device we come up with.

d. *Competition*: Similar but inadequate products are available. No known competition.