

# Prosthetic Thumb

**Design prosthetic thumb to complete everyday tasks**



- open a pill bottle
- carry a plate
- pull a suitcase
- eat with a utensil
- button up a shirt

*3D printed prosthetic thumb with silicone exterior, actuated by a friction hinge that can be locked into position with a lever*

## Full Prosthesis Assembly



## Prosthetic Thumb

*Prosthetic thumb is attached to arm using custom-fit 3D printed cuff (interior: moleskin padding) secured with boa cable system fitted with easy-to-turn 3D printed cap*

## Design Process Analysis

***Lateral pinch could satisfy the most client-requested tasks as opposed to a palmar pinch. Friction hinge with lever mechanism allows client to manually position thumb before securing with one motion. Arm cuff disperses forces over a large surface area, moleskin padding mitigates possible pain associated with all-day wear. Boa system with custom cap requires simple motion for securing prosthesis to arm.***

## Hardware Performance

***Completes client-requested tasks quickly and effectively with minimal user force. Does not interfere with client's existing mobility, is comfortable for all day wear, and can be put on & utilized by client without assistance. Operation is intuitive and requires little training.***

*Prosthetic devices improve amputees' mobility and allow them to regain independence*

*This prosthesis will improve the client's quality of life by giving him back the ability to complete everyday tasks he cannot currently do*

## Future improvements

*Modify prosthetic thumb to utilize a ball-joint and hinge to allow the thumb to rotate to oppose 2nd digit to give client additional pinch and more capabilities*

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