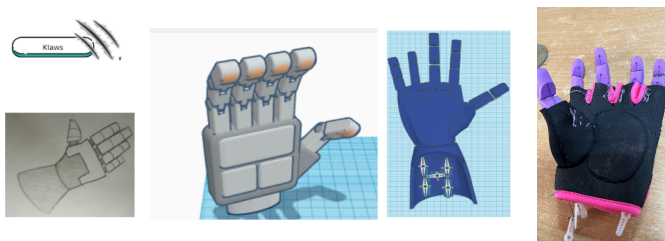


Empowering Lives, One Hand at a Time: Klaw's, Your Adaptive Robotic Companion!

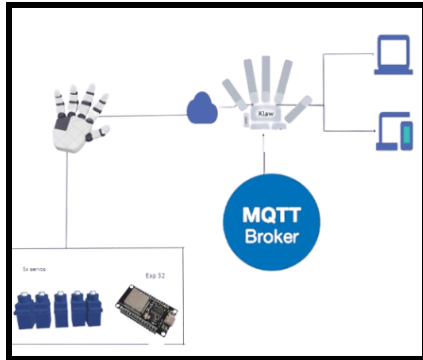
Introducing Klaw, a revolutionary robotic hand designed to enhance the lives of individuals with limb disabilities. For my final project, I'm developing an IoT solution for a prosthetic limb, with a focus on improving grip and strength control. Inspired by the limitations of existing robotic hands and my favorite cartoon character, "Dr. Claw," Klaw aims to provide a powerful and adaptable solution. By offering natural hand movement, a strong grip, and precise control, Klaw addresses daily challenges faced by those with limb differences. Moreover, the integration of IoT technology enables real-time monitoring and customization, empowering users to personalize their experience and regain independence. Klaw is not just a gadget; it's a commitment to making a positive impact on the lives of individuals with limb disabilities, offering a brighter and more empowering future.

Design process



My design process involved creating several models, starting with initial sketches, followed by my first and second 3D hand models, a cardboard prototype, and finally, the printed design. After exploring various concepts, I ultimately chose the second iteration. The cardboard model served as a crucial step, providing insights into the hand's functionality, refining my 3D model, and informing the coding aspect. This iterative approach allowed me to visualize and improve the mechanical aspects, ensuring a more effective and well-thought-out final product.

Internal architecture



Who does klaw work:

- The sliders on the webpage will send info to the servos
- The servos will move accordingly
- Which will make the fingers move

Who will use klaw?

- Diabetics: peripheral vascular disease or PVD, blood clots, or osteomyelitis
- Injuries: Especially of the hand.
- veterans

What will klaw look like?

- It will be like an extra accessory that will sit comfortably on the wrist.
- And it will have a small covering, like a glove, so it will look cool.

What does it do?

- On the app you can use the sliders to move the fingers.

Weeks of work on final project:

- Explored 3D design for hand aesthetics and functionality
- Implemented a cardboard model to assess practicality and functionality
- Initiated coding for five servos, starting with one and gradually adding others
- Focused on understanding coding intricacies and ensuring a step-by-step learning process
- Connected the coded servos to the ESP32 for tangible application
- Iterated through five different HTML page designs before settling on a final hand-like model
- Demonstrated commitment to a hands-on, iterative process for a well-executed final product

Bill of material:

Components	Price
5x servo	11,99
Esp 32	23,99
Breadboard	
Jump wires	

The making process

After printing the fingers, I faced the decision of how to create the palm. While the initial plan was to 3D print it, I aimed for a more innovative approach. I repurposed an old workout glove to serve as the hand, requiring only minor modifications such as resizing the finger holes. This posed a bit of a challenge, but I took the opportunity to relearn the skill of sewing.

After determining my objectives and planning the execution, I delved into the creative process. I extensively researched coding for servos and the ESP32, crafting a comprehensive code to control all five servos. Progressing from simple dashboards that manipulated servos, I iteratively refined them to align with my aesthetic preferences. With valuable advice, I culminated in designing my ultimate webpage. My subsequent enhancement involved incorporating a button feature, enabling the movement of two fingers to form gestures like the peace sign or thumbs up. Looking ahead, my aspiration is to implement complete voice control functionality.

Sources

3d designs	Comments for Humanoid Robotic Hand by grossrc - Thingiverse https://youtu.be/RDvs9FSZElI Makes for Left Hand robot InMoov by Gael_Langevin - Thingiverse
Robotic hand	https://youtu.be/OZ9g3O3X7dk
Voiscontrole	Control Servo Motors Through Voice Command Using Arduino Wekinator Maker Pro
Esp 32 with a servo	https://randomnerdtutorials.com/esp32-servo-motor-web-server-arduino-ide/#more-61334

My presentation slides  “Klavis”

Thank you for taking the time to review details about my final project. I trust you found it informative and engaging. If you consider replicating it, I extend my best wishes for a successful implementation. Should you have any inquiries or require additional information, please feel free to reach out. Thank you for your interest and support.