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PORTFOLIO

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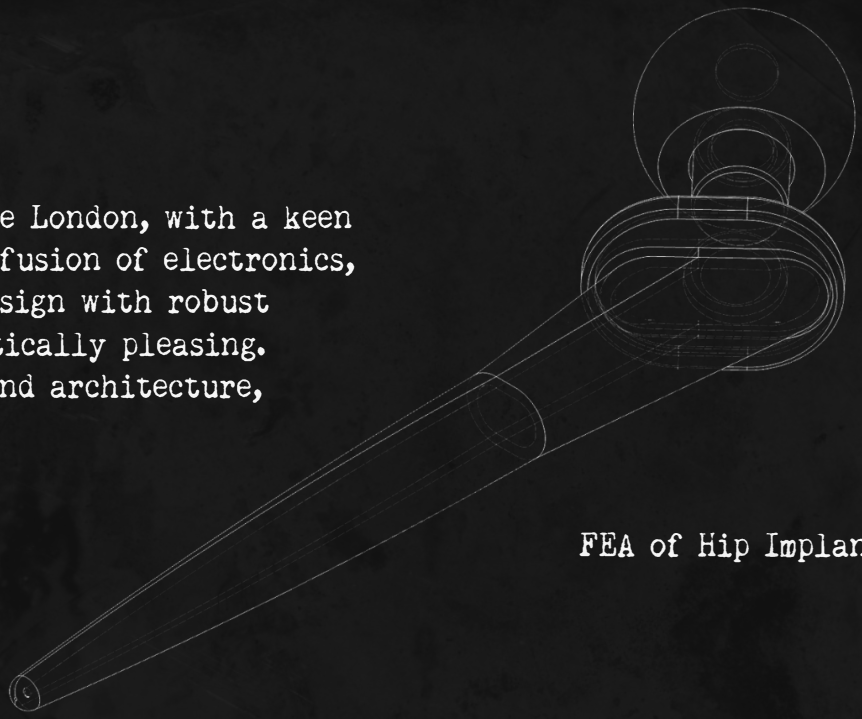
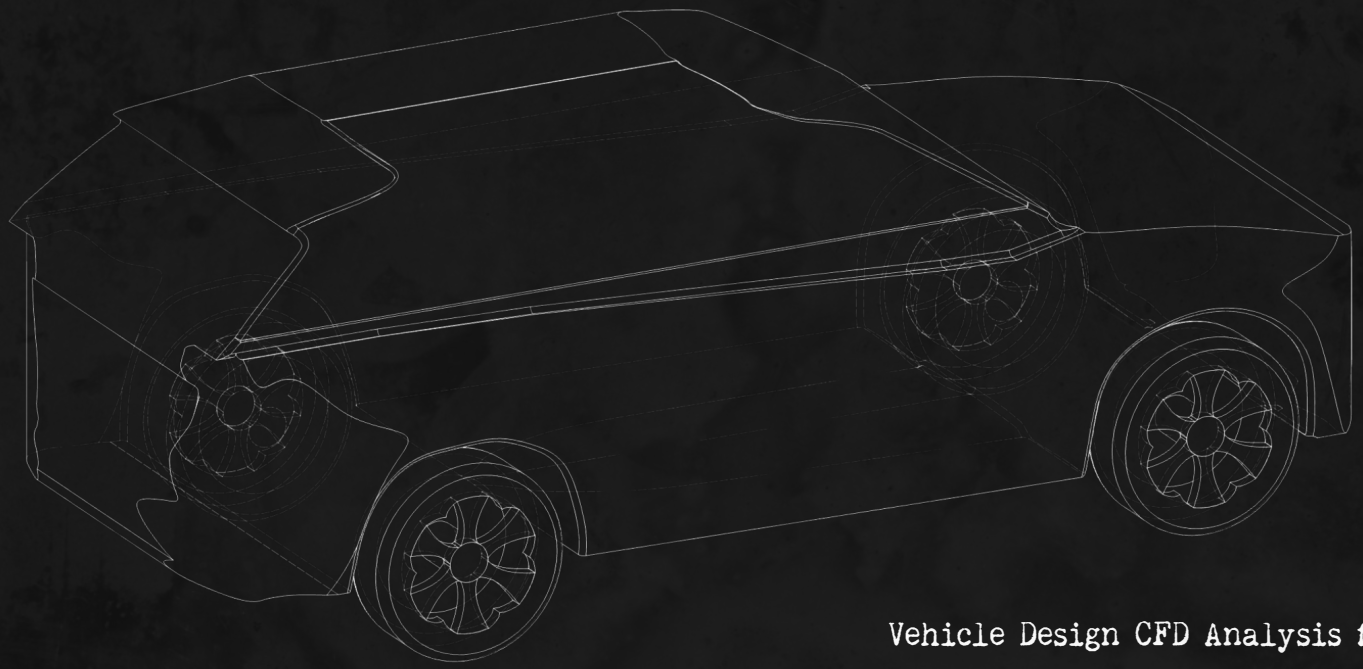
ANASTASIA

I am a second-year MEng Design Engineering student at Imperial College London, with a keen interest in the innovative field of wearables. My passion lies in the fusion of electronics, AI, and fashion. I am driven by a commitment to integrating elegant design with robust engineering to develop solutions that are both functional and aesthetically pleasing. Beyond my core focus, I have a deep interest in the arts, literature, and architecture, which continually inspire my work.



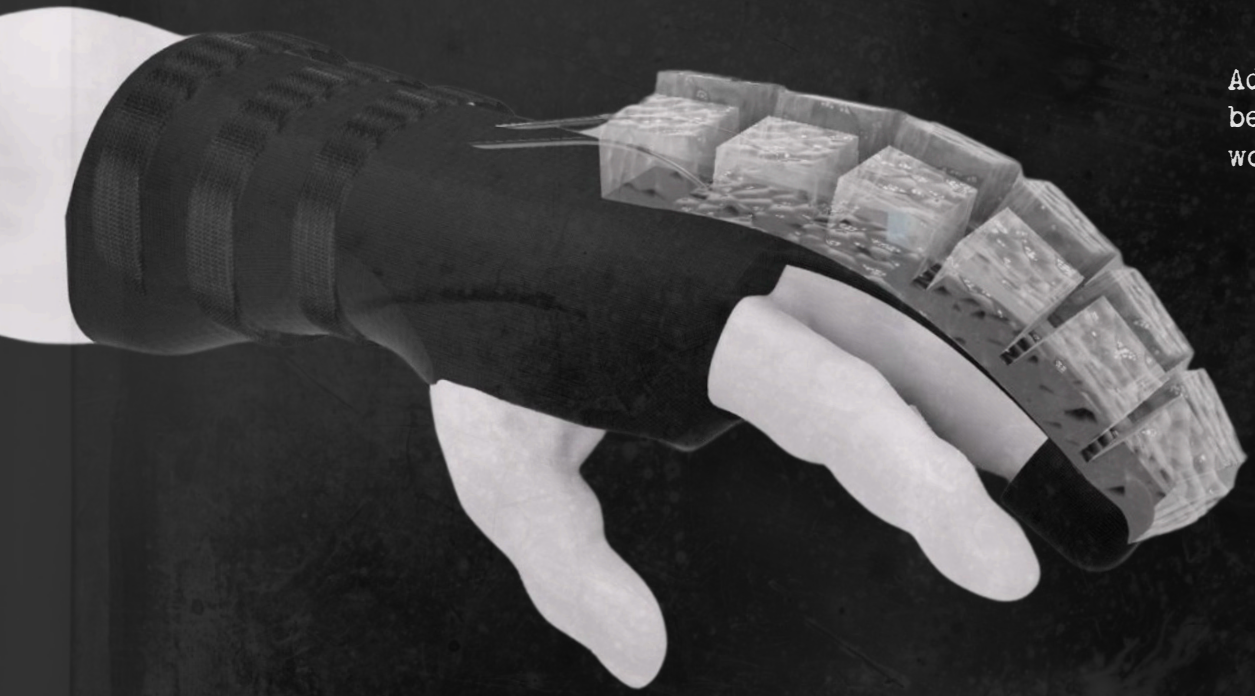
FEA of Hip Implant



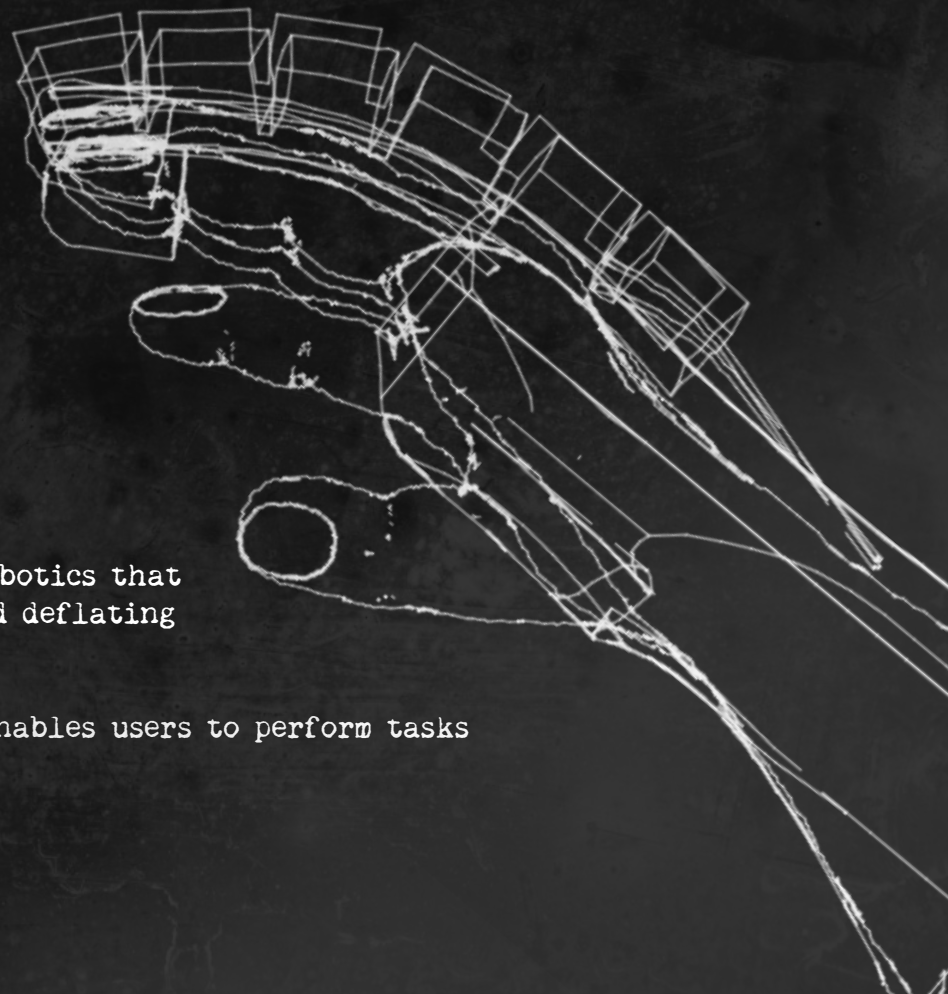
Vehicle Design CFD Analysis for Thermofluids

EXO GLOVE

The Exo Glove is a wearable technology designed to boost grip strength and reduce strain for women DIY enthusiasts and homeowners.



Addressing the gap in grip and upper body strength between men and women, the Exo Glove aims to empower women to handle home improvement tasks efficiently.



Make power tools universally accessible, transcending gender biases and challenging the notion that has seen men as the default human model.

This innovative glove enhances grip strength using air pumps and soft robotics that curl the fingers upon contact with an object, providing a secure hold and deflating once the object is released.

By focusing on ergonomic comfort and minimising fatigue, the Exo Glove enables users to perform tasks requiring manual dexterity more effectively.

June 2024, Industrial Design Engineering

EXO GLOVE

The Exo Glove was developed using advanced soft robotics and ergonomic design principles. Silicone actuators made from EcoFlex 20 and 30 were prototyped with 3D-printed molds to ensure optimal flexibility and durability. High-performance synthetic fabrics like polyester, nylon, and spandex were chosen for comfort and breathability. Force-sensitive resistors (FSRs) were integrated into the fingertips to detect grip pressure accurately. An ESP32 microcontroller manages the air pumps and solenoid valves, ensuring precise and responsive operation. Additionally, the glove was designed to be ambidextrous, catering to both right-handed and left-handed users. Through this detailed and iterative process, the Exo Glove emerged as a sophisticated, user-centric solution to enhance grip strength and reduce strain for women DIY enthusiasts. The glove is powered by rechargeable lithium-ion batteries arranged in a 3S5P configuration, providing ample power for up to eight hours of continuous use.

An appropriate case was designed using AutoCAD and 3D printed, providing space for both the breadboard and Arduino.

June 2024, Industrial Design Engineering

BIOMORPHUS

This project unveils a conceptual, biomimicry-inspired dress that blends fashion with technology, reacting to environmental changes like natural organisms. Equipped with sensors for distance, light, and sound, the dress transforms with fabric flowers, Electroluminescent Wire, and reactive movements, mimicking nature's intricate behaviors.

Try to redefine the interaction between humans and machines, transcending beyond the conventional confines of buttons and passive interfaces.

At the core of this creation is the idea of symbiotic interaction, where the dress becomes an extension of the wearer, responding and adapting organically to environmental stimuli.

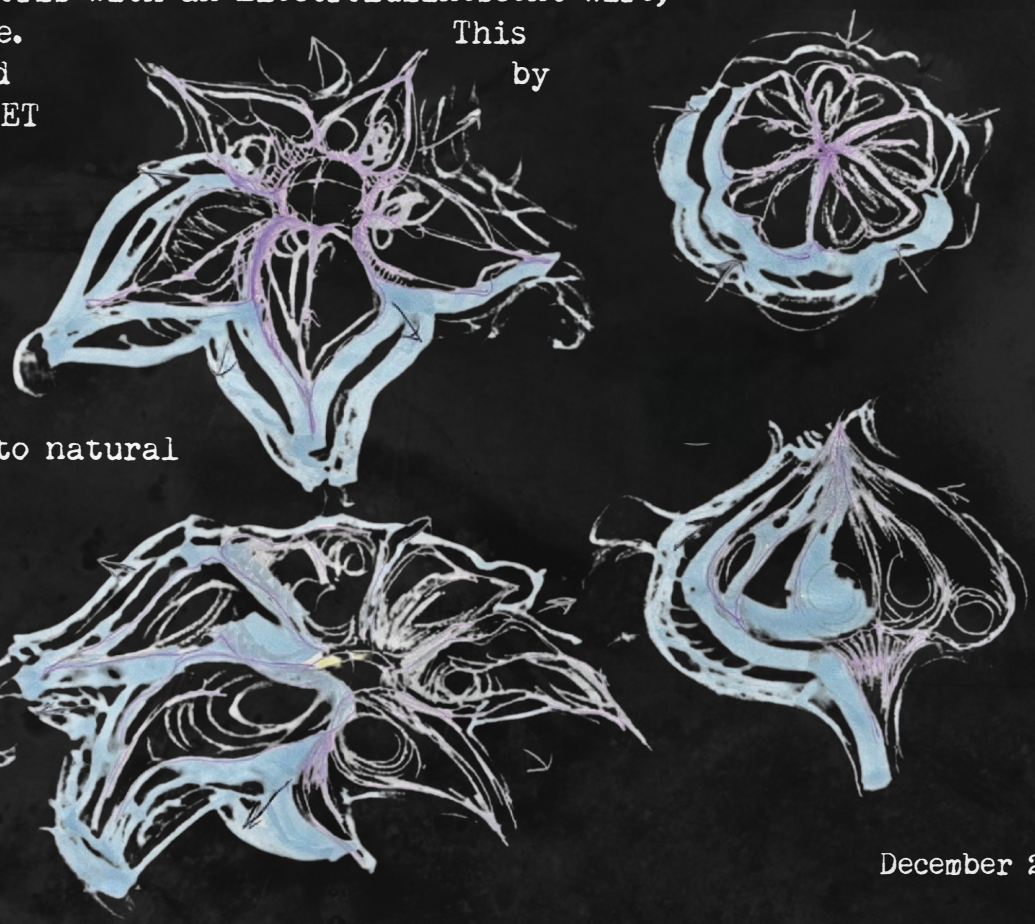
This concept challenges and expands our understanding of how we can harmoniously integrate technology into our daily lives.

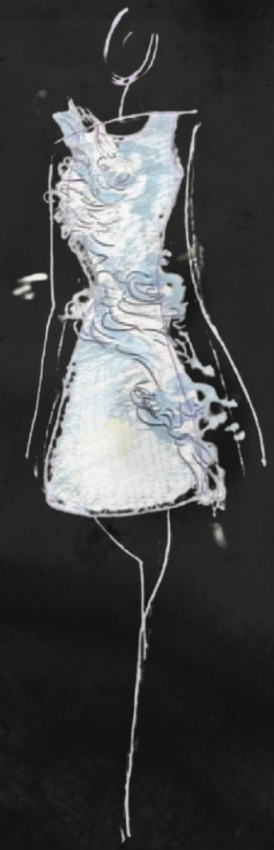
By incorporating elements that mimic natural organisms, it blurs the lines between the animate and inanimate, creating a more dynamic and empathetic relationship between humans and the technology they interact with.

December 2023, Physical Computing

BIOMORPHUS

The dress, crafted from a transparent, pearl-like fabric, incorporates three sensors that enable it to respond uniquely to environmental in ways akin to certain living organisms. The dress, crafted from a transparent, pearl-like fabric, incorporates three sensors that enable it to respond uniquely to environmental in ways akin to certain living organisms. The distance sensor, connected to a DC motor, animates fabric structures resembling flowers, mimicking the reactive behaviour of plants like the Mimosa Pudica through a thread pull system. These structures close when an object approaches and reopen as it movesaway. As the light dims, the dress transforms with an Electroluminescent Wire, reminiscent of bioluminescent algae. This feature is integrated and regulated by a light sensor coupled with a MOSFET circuit, adding a mystical glow to the garment. The dress features a servo motor that reacts to sound and sudden air movements, particularly sudden loud noises and sudden air movements. Causing the dress to oscillate in a manner akin to natural defense responses.

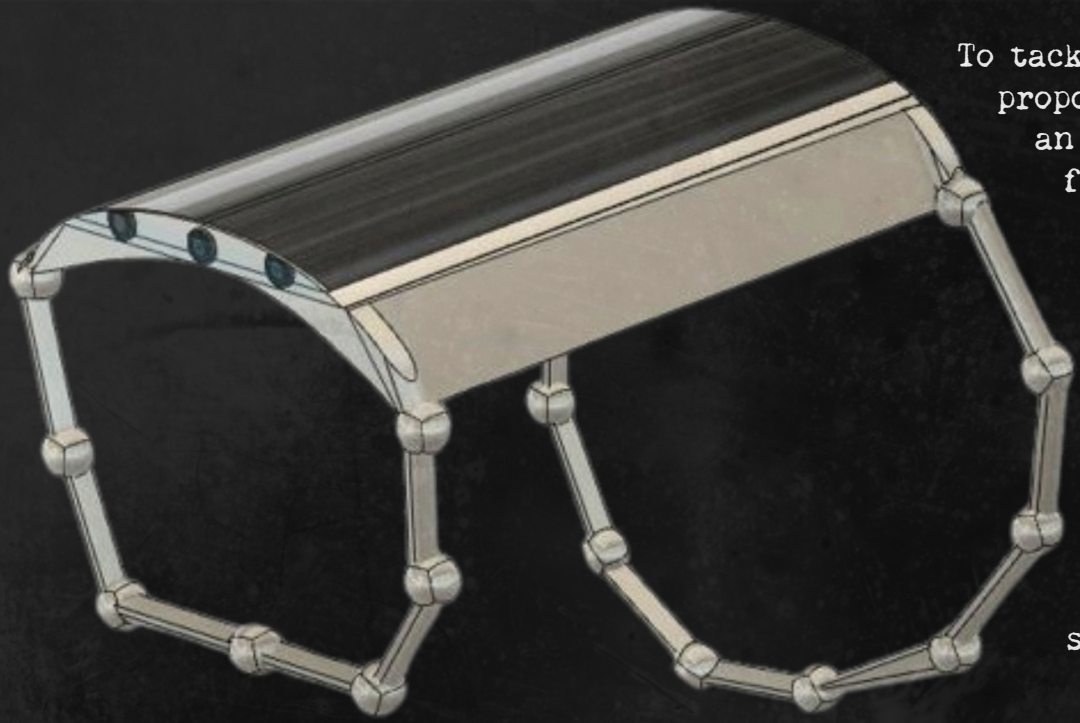




December 2023, Physical Computing

INNOVICE

The project aims to address the significant wastefulness in the furniture industry by targeting the inefficient management of discarded furniture. In the UK alone, only 17% of disposed furniture is recycled, with 22 million pieces discarded annually. The primary focus is on large corporations where most furniture disposal occurs, emphasising the repair and return sector to prevent potentially fixable furniture from ending up in landfills.



To tackle this issue, the project proposes the development of an AI-powered platform that facilitates furniture repair. The solution includes creating a concept for a damage scanner that can be used in the industry to streamline and expedite the fixing process. The goal is to make the furniture repair process easy and accessible.

By integrating this technology into existing systems, such as handheld computers used in large furniture companies, the project aims to reduce the manual errors in the repair process and enhance the skill set of employees involved in furniture repair.

June 2023, Human Centred Design

INNOVICE

Data collection involved dividing the furniture life cycle into five stages: design, manufacture, retail, consumer, and landfill.

This scanner would
facilitate damage
includes a wearable
camera, and CAD
workers by
and comparing
The ergonomic
environments, while
repair solutions,
fostering a circular

be integrated into handheld devices used by waste managers to
repair and promote a circular economy. The solution also
AI-powered mobile computer equipped with a 3D scanner,
software. This device would assist furniture repair
providing style, color, and pattern suggestions
prices and dimensions of different products.
design ensures ease of use in workshop
the AI algorithm generates efficient
ultimately reducing waste and
economy.

The project aims to merge manual scanning
and application functions into a single
efficient device, revolutionising the furniture
repair industry.

INNOVICE

June 2023, Human Centred Design