
AION
ENHANCING CYBERSPACE
IMMERSION WITH A
VISIONARY PROSTHETIC

AION

Enhancing cyberspace immersion with a visionary prosthetic

Aion, a 2062 vision of a prosthetic, bridges physical and digital worlds using VR and AI, granting users access to an immersive cyberspace. Giving its users additional abilities inspires admiration for prosthetics and future tech. The vision aims to encourage others to explore these possibilities and strive towards a future we want to live in.

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GOALS

The following chapter aims to delve into the goals driving the creation of the project. Exploring its purpose and objectives provides a deeper understanding of its significance and potential impact.

Summary of goals

My goal as a designer is to design for the future to adapt to developing technology that can change every aspect of our lives.

In designing a future environment, my objective is to envision a futuristic scenario that is not only desirable but also inspires us to strive towards a positive future: to create the future we want to live in.

In this environment, I want to show technology in a positive setting by creating a technologically advanced prosthetic.

Lastly, all of these steps aid in the concept of the prosthetic to better the lives of the users and change people's perspective on prosthetics, thus allowing the user to be proud of their prosthetic rather than ashamed of it.

Goal | Create an innovative product

Technology is rapidly advancing, and the world must adapt whether it wants to. This is especially true for product designers who shape future products. The innovation it brings with it has a significant impact on product design, and designers must embrace new technologies and concepts to create innovative designs.

For example, integrating microchips into machines has a profound transformative effect on products. Once integrated, the machine can perform previously impossible tasks.
The integration of microchips allows machines to become more intelligent and more efficient. For instance, when they were integrated into cameras, it completely changed the way pictures are taken. People had to rely on film to take pictures, but with the development of digital cameras, microchips could process and store the digital data of the images. With this progress, the product and interaction design vastly changed.

Industrial designers need to be willing to take risks and embrace new technologies and concepts. Taking risks can help them develop innovative problem-solving products that could significantly impact the world today and in the future. More significant progress in product development can be supported by encouraging designers to think about futuristic concepts and the potential impact of technology. They can adapt to future needs and create products by focusing on trends and technology development.

GOALS

"The future is made everyday by the action of people. We control our own future. It is precisely because of this that we must talk about the future we want to live in and explore the various futures we must avoid"

Johnson, Brian David

Goal | Desirable futuristic scenario

Inspired by this quote, my objective is to envision a science fiction prototype of a futuristic scenario that is not only desirable but also inspires us to strive towards a positive future: to create the future we want to live in

Prosthetic or cybernetic enhancements are often associated with a dystopian view in the cyberpunk genre, leading to feelings of fear and unease. However, technology itself is neutral and should be used to improve our lives and the environment. It is our choices and imagination that determine whether it is utilized positively or negatively.

In my concept, I aim to integrate the concept of a prosthetic within a positive setting, inspiring a vision for a better future.

Continuing on the path of urbanization and neglecting nature would only lead us closer to the dystopian megacity scenarios depicted in cyberpunk films. The genre serves as a cautionary exploration of the consequences of unchecked technological advancement in a dystopian context.

Cyberpunk narratives often portray a future society where technology is highly advanced, while individuals suffer. These stories serve as a reminder of the importance of maintaining a balance between technological progress and the preservation of our core values.

While we enjoy the cyberpunk genre as a work of fiction, we must remember that its scenarios are not far-fetched and could potentially become our reality if we are not mindful. The dystopic lifestyle depicted in cyberpunk is one we should strive to avoid, aiming instead for a future where technology serves to enhance our lives while preserving our humanity.

GOALS

Goal | Prosthetic in a new light

Create a digital vision of a prosthetic to improve the lives of people in need of them

The objective is to improve the perception of prosthetics, turning them from objects associated with shame to sources of admiration. This transformation will be achieved by enhancing the usability and functionality of prosthetic devices.

One key focus is to enable users to have complete and natural control over their artificial limbs, allowing them to seamlessly integrate the prosthetic as an extension of their own body.

Furthermore, I explore the integration of additional advantages and capabilities into prosthetic devices, surpassing the capabilities of individuals without prosthetics. Offering these unique advantages encourages a sense of admiration for the technology itself.

The underlying thesis is that if a product provides its user with advantages or additional abilities, it will become a highly desired product and be perceived positively by society.

Some questions that come to mind

Technological features: Which type of technology can I incorporate to ensure an innovative design which benefits the user? How can it improve the user's experience?

Aesthetic features: What design features can create an aesthetically pleasing prosthetic arm?

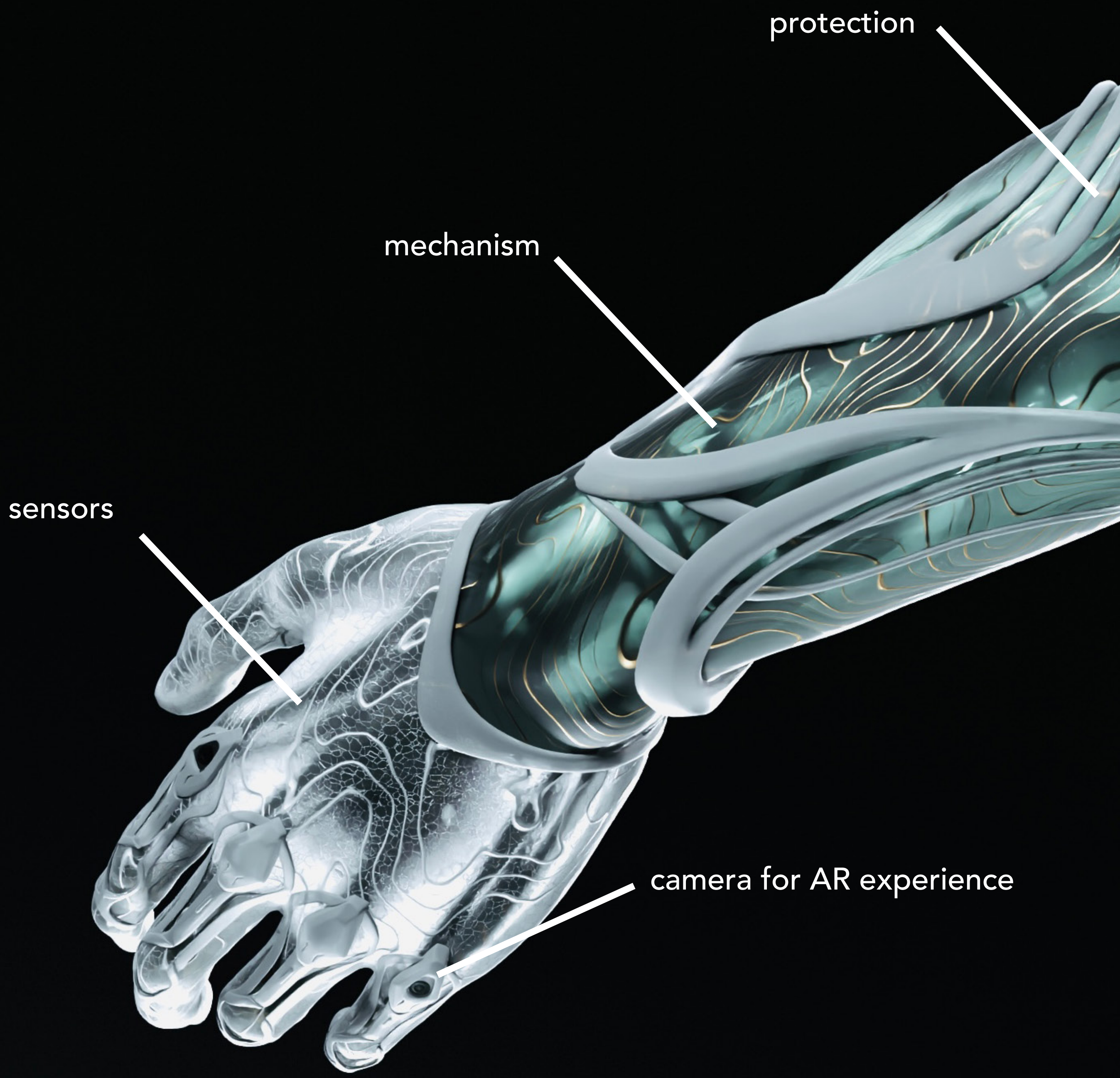
Additional components: How can a prosthetic be personalized? Which additional component could benefit the user?

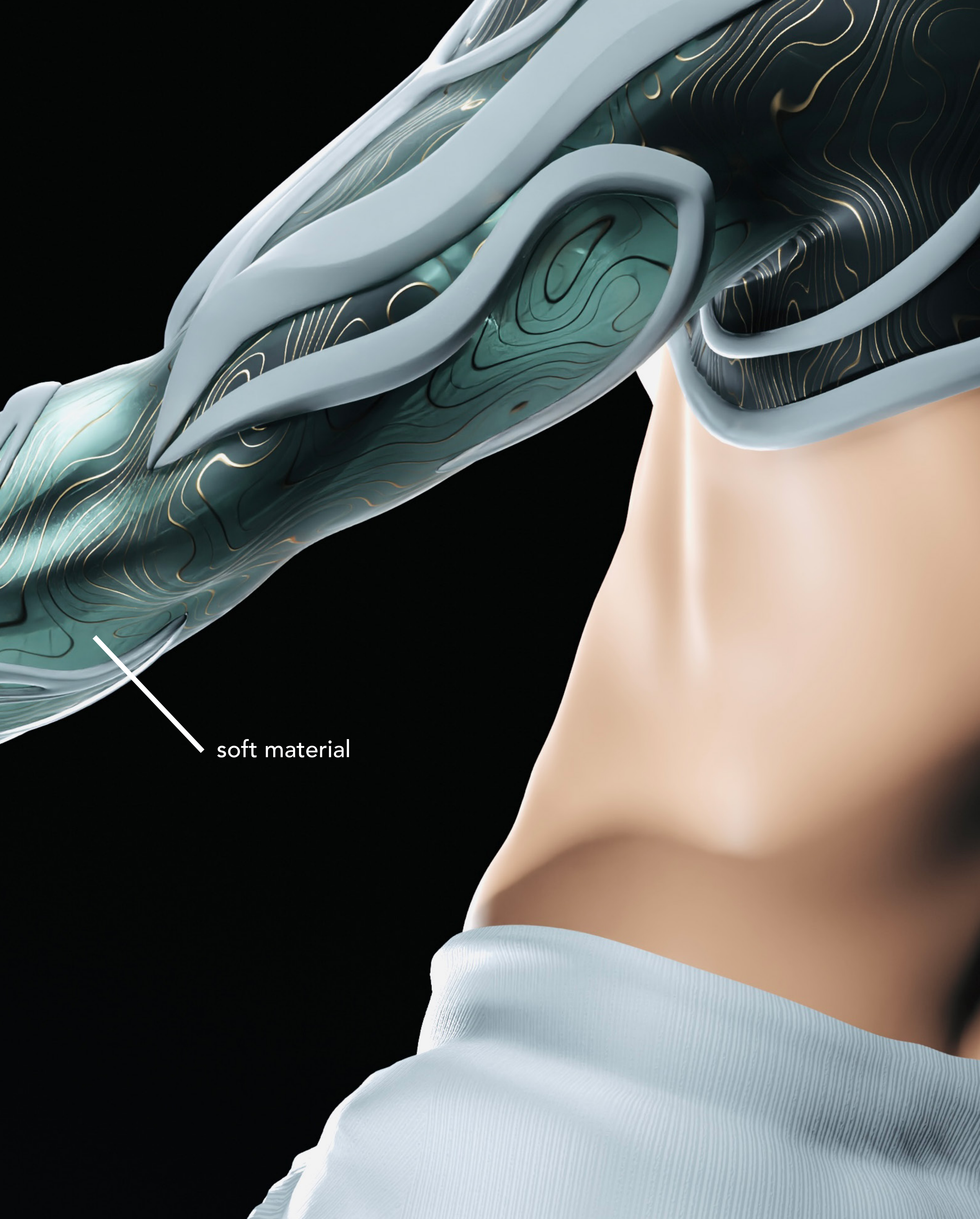
Ergonomic features: How to design the prosthetic to fit comfortably and seamlessly with the user's body, which can improve both the look and feel of the prosthetic?

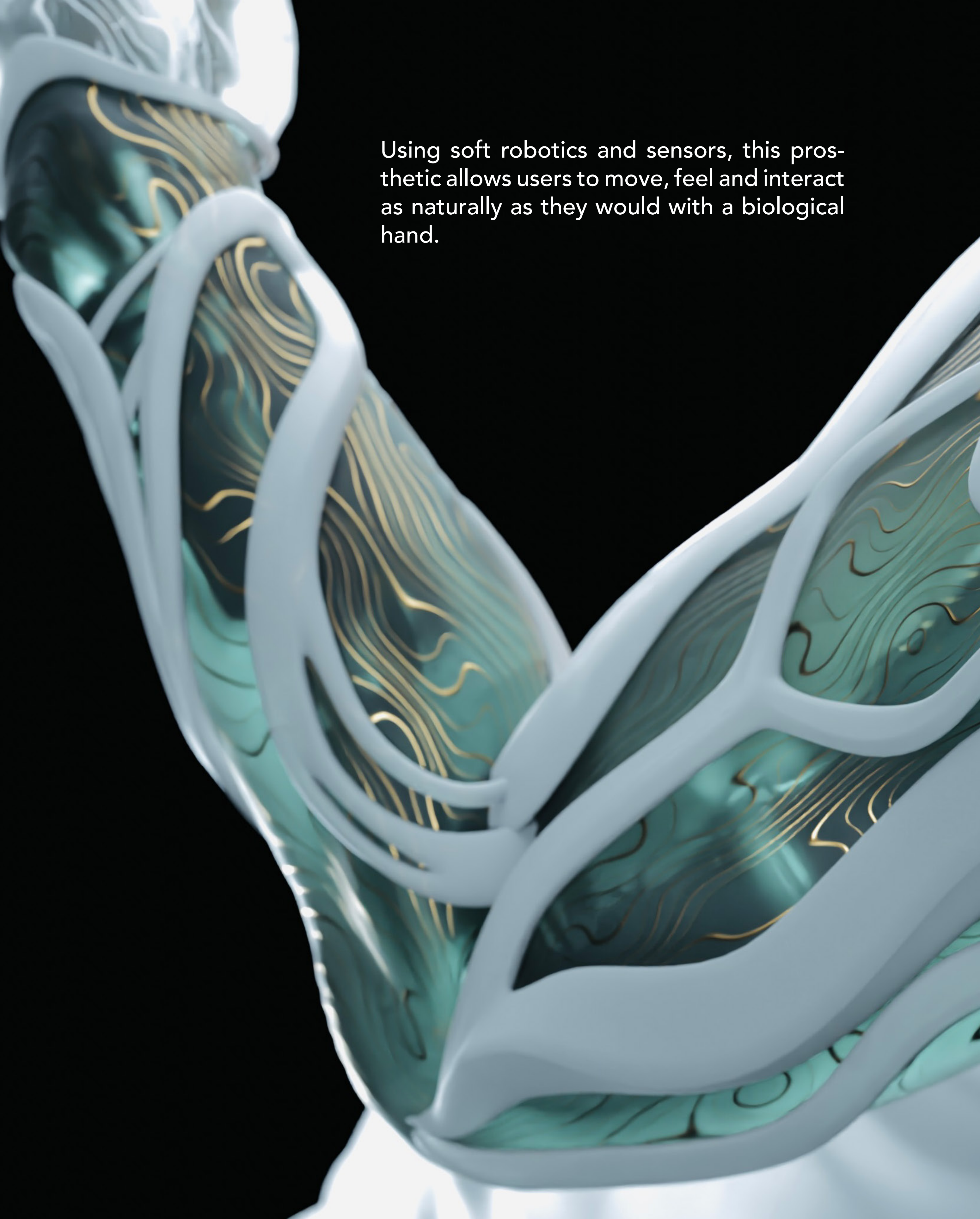
Symbolic features: Can a personal/general symbolic significance support the goal? If so, how could this be integrated and in what way?

Emotional features: What design elements can be incorporated to evoke a positive emotional response from users?

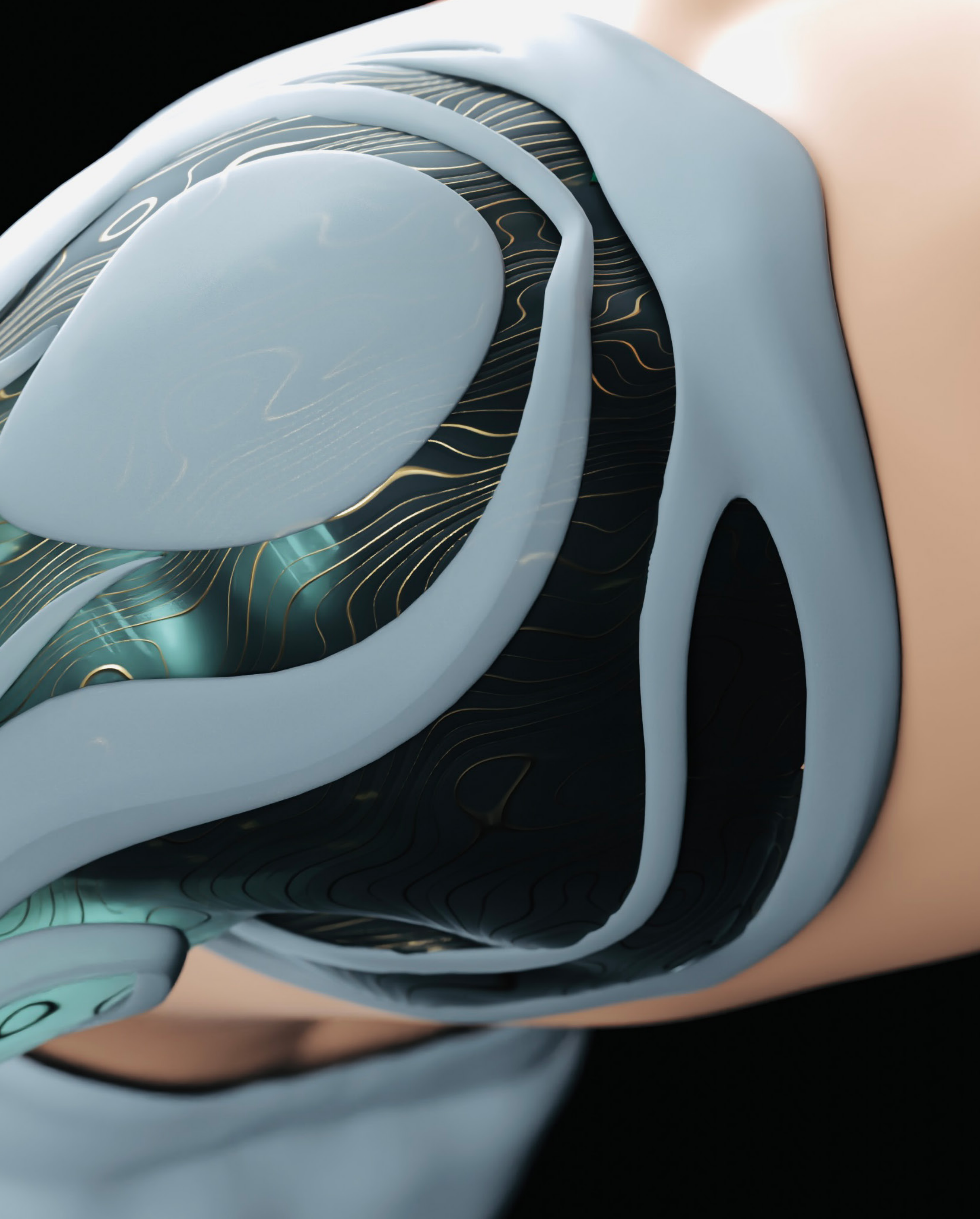
AION'S CONCEPT



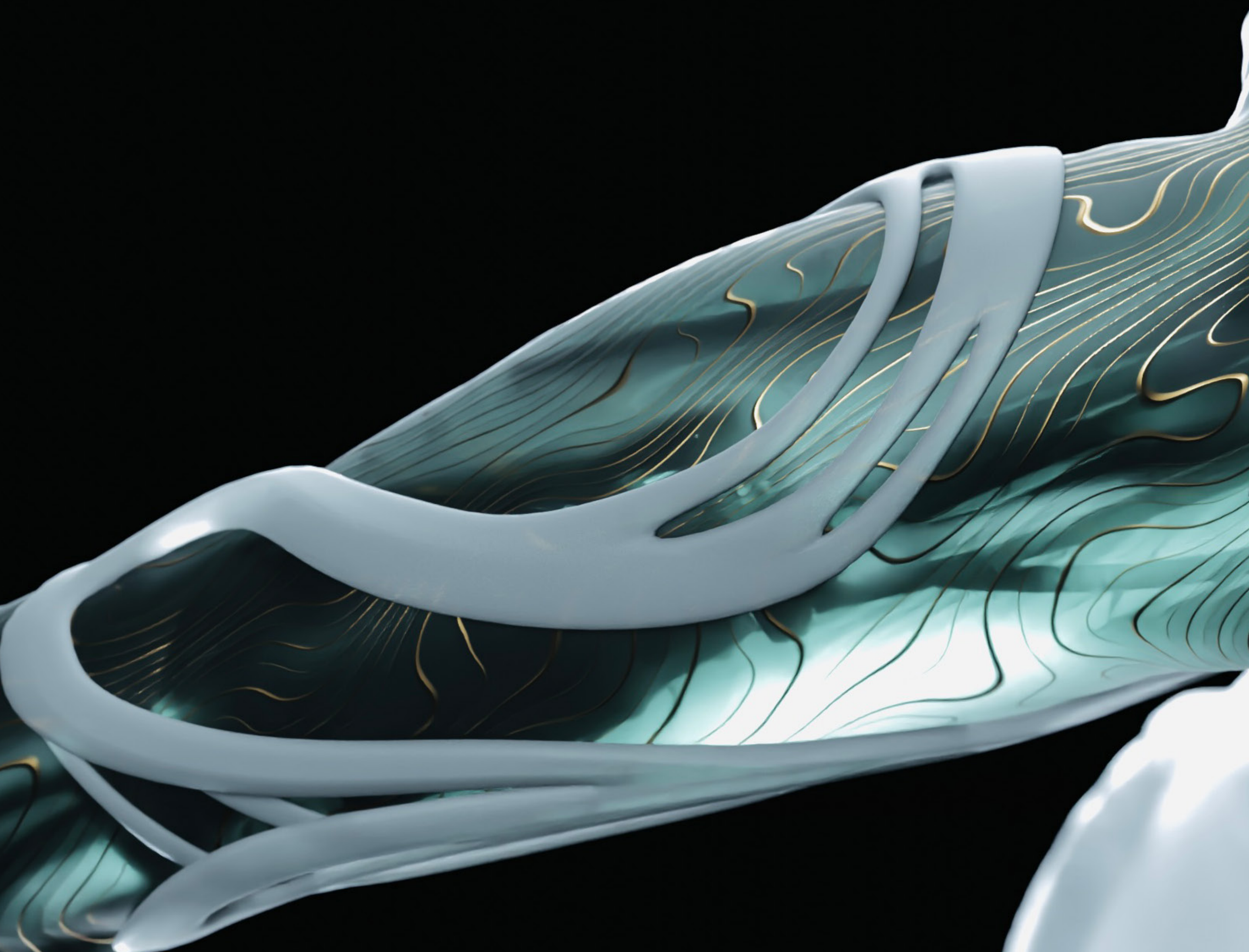

soft material

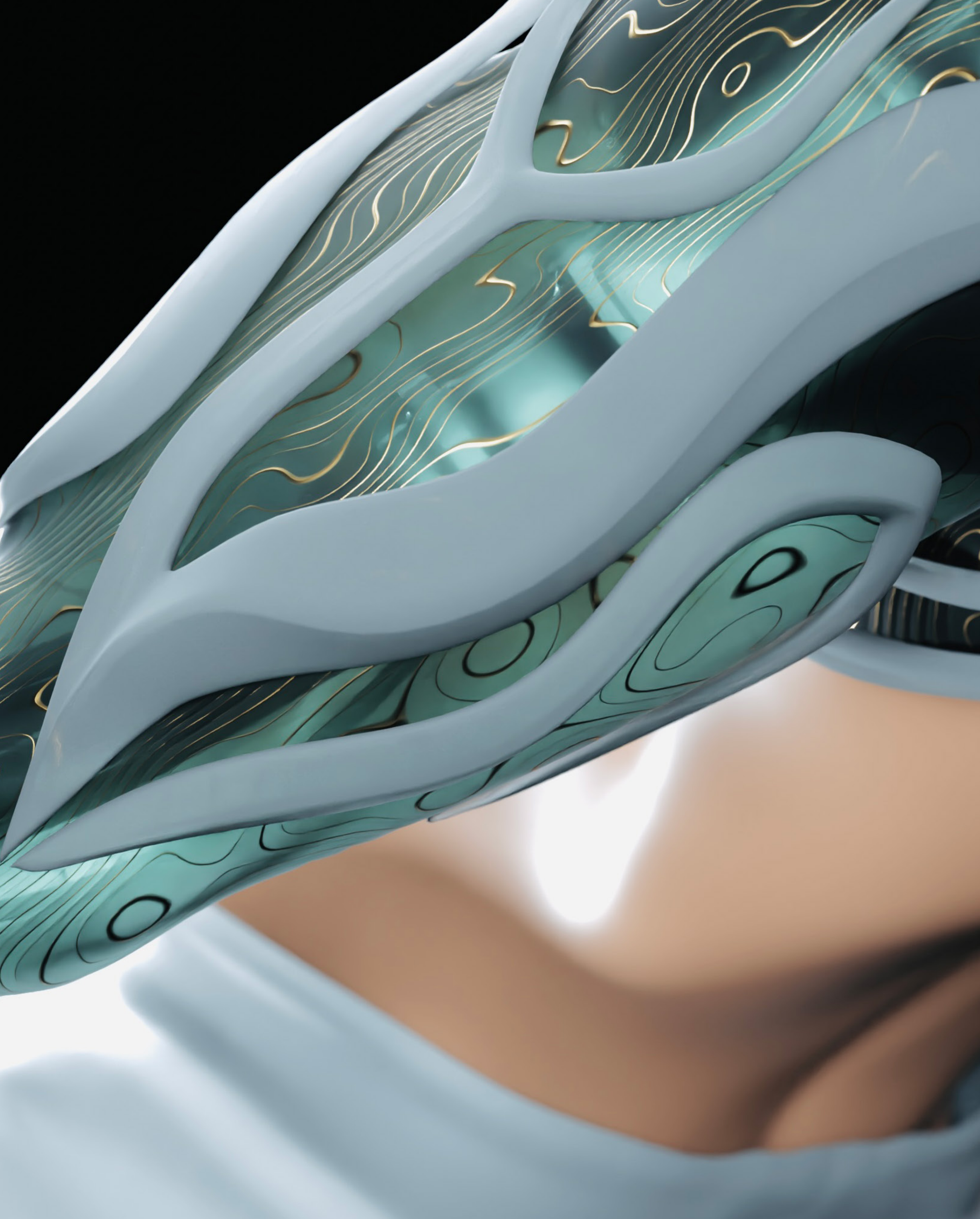


Using soft robotics and sensors, this prosthetic allows users to move, feel and interact as naturally as they would with a biological hand.



Soft robotics is a technology that uses flexible materials to mimic the natural movement of biological systems. It moves in response to electrical signals and pneumatic or hydraulic systems.



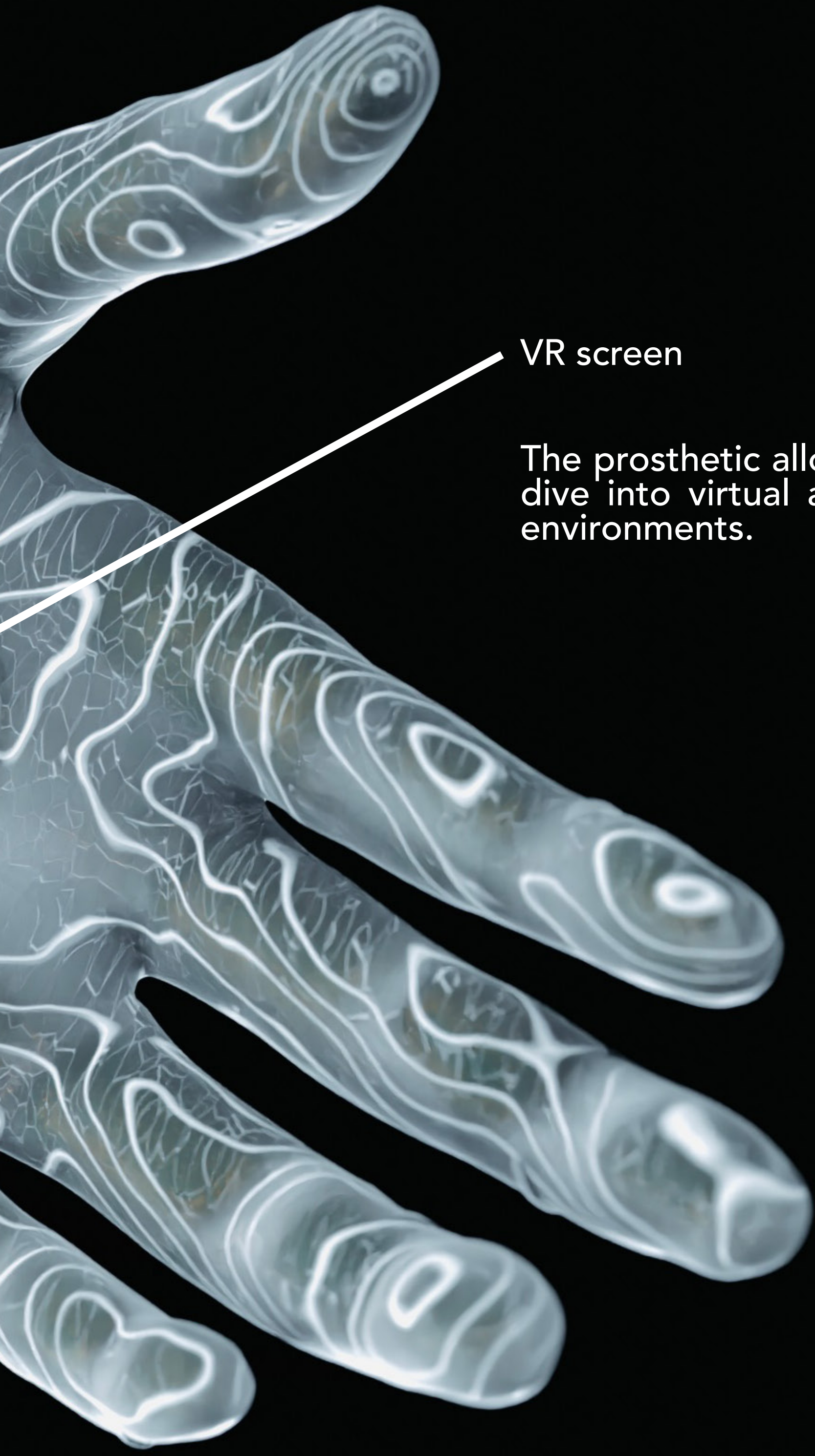


Soft Robotics

+Provides a wider range of motion.

+Safer for both the user and those around them.

+Support meaningful interactions with others.



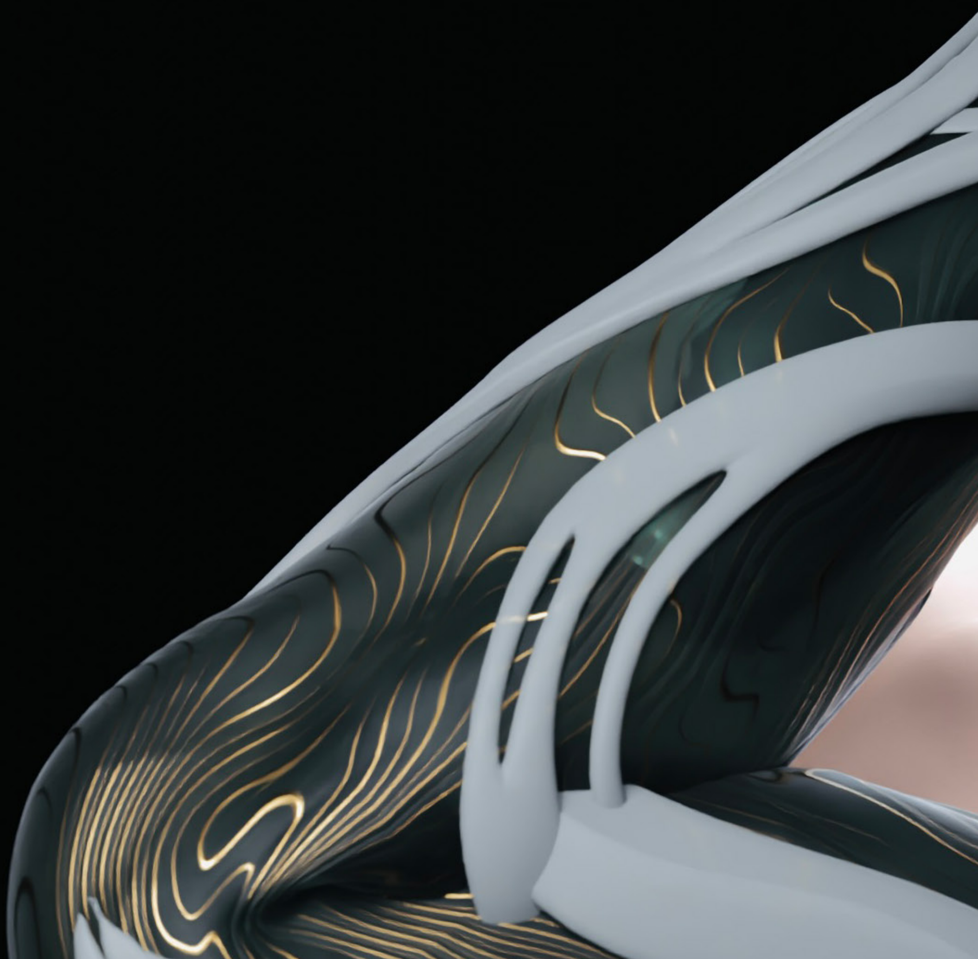
The prosthetic allows the user to quickly dive into virtual and augmented reality environments.

In 2062, virtual and augmented reality (AR/ VR) replaced screens, offering immersive experiences.

The seamless ability to swiftly dive into AR/VR has become essential for the future user.

By simply placing the palm of their prosthetic hand over their eye, users can enter immersive digital worlds through an embedded screen.

Enabling an immersion into cyber-space and access to communica-tion, information, entertainment and more.

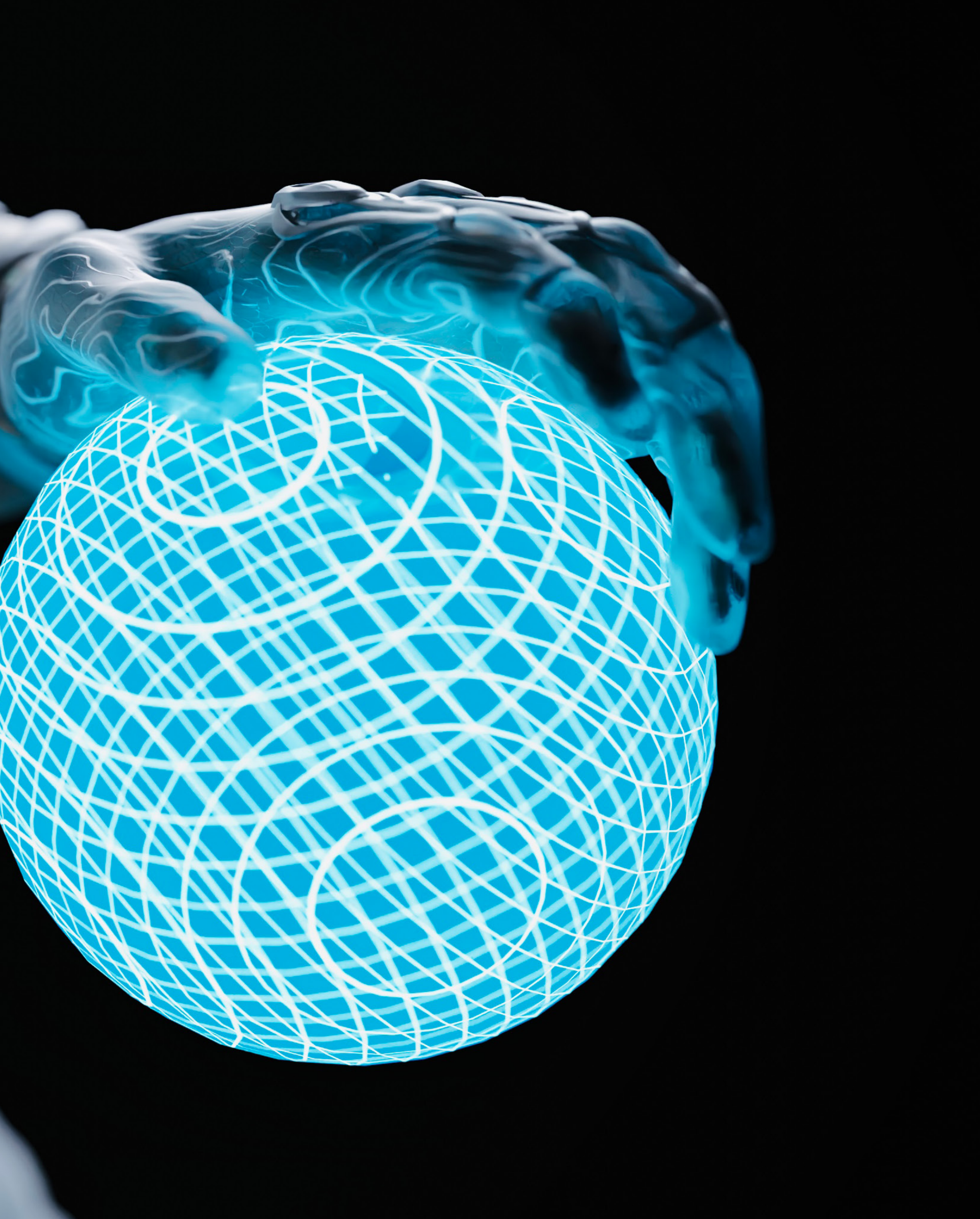


As the user enters the digital realm with their palm, the physical prosthetic remains still and the nerve control and sensory feedback transfer over to the digital arm in AR.

The digital arm, which is solely visible in the virtual world, allows the user to feel and interact with virtual objects.

This innovative approach blurs the boundaries between the physical and digital realms, creating a unique and immersive experience for the user.

To dive for longer periods of time in the virtual world, the user can use AR glasses.
In this scenario, AI algorithms can halt the prosthetic's movements when the user interacts with a digital object. This gives the user the illusion of touching and manipulating objects in the virtual world.



This vision aims to inspire developing technologies today, scientists and others to dive into these possibilities and take a look at what the future may hold.

SCENARIO

This chapter dives into the creation of a vision of a scenario for the goal "desirable futuristic scenario"

In the past, there have been various visions and predictions from science fiction pioneers about how products and technology would evolve in the future. These predictions often reflected the aspirations, imaginations, and expectations of that time. While some of those visions have become true in some form, others may appear funny or absurd in hindsight.

Predicting the future remains an ongoing practice pursued by scientists and people worldwide. Through analysis, research, and imaginative speculation, individuals continue to envision how products, technology, and society may evolve.

Today, Michio Kaku, a prominent figure in theoretical physics and futurism, actively engages in envisioning the future through his work. Drawing on scientific knowledge and technological advancements, he offers insights into potential developments, particularly in advanced technologies. Kaku's contributions inspire dialogue and encourage us to shape a future that aligns with our goals and values.

Kaku's predictions often revolve around advanced technologies, such as nanotechnology, artificial intelligence, quantum computing, and space exploration. He explores how these technologies could transform various aspects of our lives, from healthcare and energy to transportation and communication.

Michio Kaku's visions, along with the work of science fiction pioneers, have been a great inspiration for me. They have motivated me to embark on a similar journey of envisioning the future. Drawing inspiration from today's technology, I aim to create a scenario that combines elements of the present with a desirable and appealing vision of the future, according to my perspective.

SCENARIO

Venture on a trip to the year 2062, a world that is experiencing a technological revolution fueled by the fourth wave of science and technology.

The fourth wave of science and technology has hit, and it's now in full swing. The advancements we've seen in recent years have transformed the world in ways that were once thought impossible, bringing us into a new era of innovation and progress.

But what are these waves of technology, and what makes the fourth wave so special? The first wave began with the Industrial Revolution when steam power and machinery transformed the way we lived and worked. The second wave followed in the mid-20th century, with the advent of mass production and the rise of electronics.
The third wave was the digital revolution, which began in the 1970s and continued into the early 21st century. This wave was characterized by the rise of computers, the internet, and other digital technologies that have transformed the way we communicate and access information.
And now, we find ourselves in the midst of the fourth wave, which is characterized by the convergence of technologies such as artificial intelligence, nanotechnology, biotechnology, and robotics. This wave has brought about a level of innovation and progress that we could only have dreamed of in the past.

As we walk down the streets of the city in the year 2062, we're struck by the beauty and efficiency of our surroundings. Smart buildings tower above us, equipped with advanced energy-efficient systems that help reduce the carbon footprint of our city. Transportation is fully automated, with self-driving cars and high-speed trains.

The role that artificial intelligence plays in everyday life is truly remarkable. AI assistants are commonplace, helping us manage our schedules, answer questions, and provide companionship. Our AI assistants can understand us like never before, responding to our natural language commands and even anticipating our needs before we ask.

The cyberspace of 2062 is a world of endless possibilities. It's an immersive experience that goes far beyond screens. We enter virtual reality environments and interact with others in new and exciting ways. We can explore far-off lands, learn new skills, and attend concerts and events without ever leaving our homes. And the best part is that AR and VR technologies have replaced screens, allowing us to interact with the world in more natural and intuitive ways.

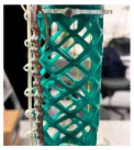
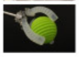
But perhaps the most significant change in the world of 2062 is the way we interact with each other. With more time on our hands, we're able to focus on building relationships with others, whether in-person or online. The world is a more connected and empathetic place, with people taking the time to understand each other and to build communities around shared interests and values.

The challenges that we face in 2062 are met with a sense of optimism and hope. Thanks to the power of technology, we're able to create a brighter and more equitable future for ourselves and for generations to come. The world of 2062 is full of exciting opportunities.

DEVELOPING TECHNOLOGY

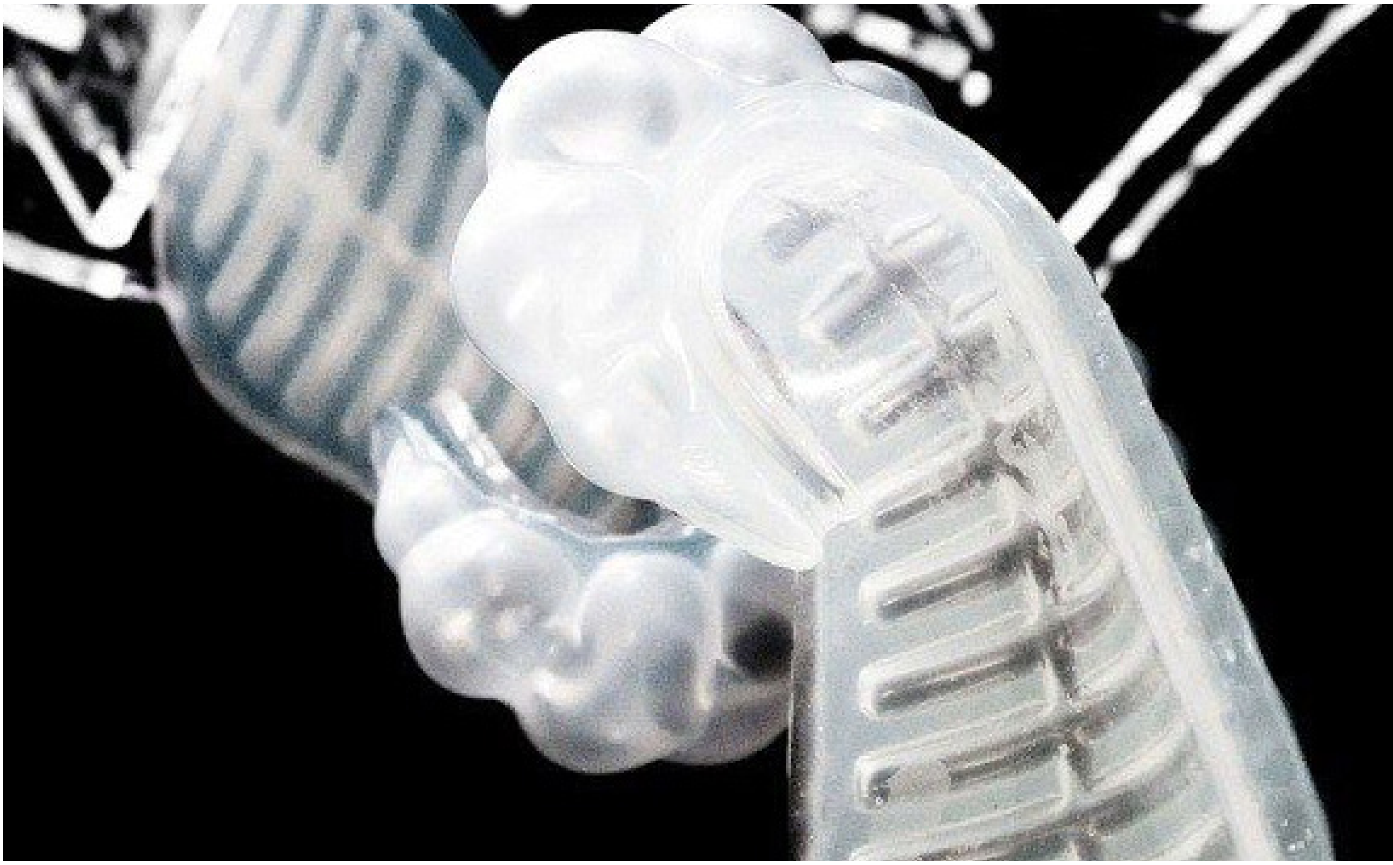
To create a vision of a futuristic prosthetic, it is important to assess the ongoing development of technology. I have explored how emerging technologies can impact the advancement of prosthetics and their potential integration for added benefits

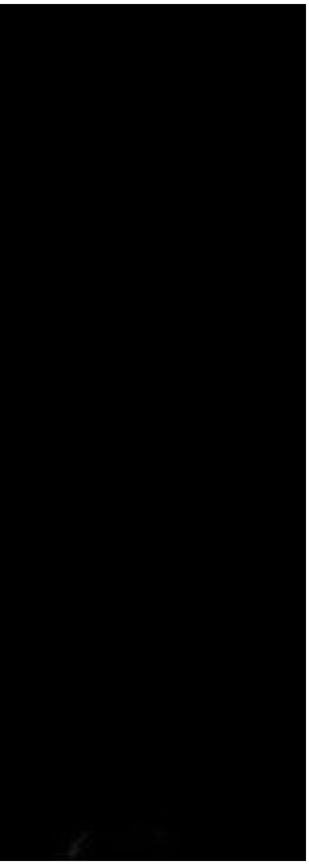
During my exploration, I came across fascinating technologies, such as levitation and more. However, what captivated me the most in relation to prosthetics was the field of soft robotics. The concept of soft robotics offers immense potential for creating prosthetic devices that are flexible, adaptable, and capable of mimicking natural movements.

	**Wave spring:** Used for compliance in robots. Kai said:"you would rather have this robot in your Hous as aid, than a typical robot hand	A compliant robot is easy to make with shapes like this and an elastic material. This shape was 3D printed with an elastic material. Allows for quick and easy possibility for a compliant robot. Flexibility: The use of wave patterns allows the robots to have a greater range of motion and flexibility, making them more adaptable to different environments and tasks. Durability: Soft robots using wave patterns are less likely to break from impact due to their flexibility and ability to absorb force.	Imprecise: Set robots aren't precise and strong as rigid robots/robots with joints Complexity: The design of robots using wave patterns is often more complex than traditional robots, which can make them harder to manufacture and repair. Limited strength Capacity: Soft robots using wave patterns are generally limited in terms of the amount of weight they can carry or manipulate due to their flexible design.
	**compliance form:** Form and material together form a a compliance joint: stretchy, bendable and bouncy on all sides, no rigid joints.	Can be formed in one go easy to make	Could break easily
	**Soft robotics, Silicon Material** Silicon is used as it is one of the main materials in soft robotics. Soft robotics are robots with no rigid joint and therefore the way to control them different: they are often blown up with hair to form the wanted pressure and therefore move the robot.	**Soft robotics, Silicon Material**   One advantage of soft robotics is their ability to interact with delicate or fragile objects, making them ideal for use in surgery or other medical applications. Soft robots are also able to operate in unstructured environments, such as disaster zones or outer space, where traditional rigid robots would have difficulty maneuvering. This makes them much more adapted for human interaction. Enhanced flexibility: Soft robotics technology allows for greater flexibility and adaptability of the prosthetic arm, allowing for more natural movements. Reduced weight: Soft robotic components are generally lighter in weight than traditional prosthetic components, which can make the prosthetic arm more comfortable to wear. Improved user experience: Soft robotics technology can provide a more natural and intuitive user experience. Implementing soft robotics in a prosthetic could give it approachable look, removing the feeling of unease that some people might experience when interacting with something that is not human-like.	Durability: Soft robotics components may not be as durable as traditional prosthetic components, which could require more frequent maintenance or replacement. Complexity: Incorporating soft robotics technology into a prosthetic arm may make the device more complex, which could require more training or technical expertise to operate and maintain. Power source: Soft robotics components may require additional power sources, which could add weight and complexity to the prosthetic arm. Cost: While soft robotics technology is becoming more cost-effective, it may still be more expensive than traditional prosthetic components, which could make it less accessible to some people.
 	**Bioengeneering (tissue engeneering)** Bioengineering is manipulating cells and biological bodies.	Increased functionality: Bioengineering technology can provide a prosthetic arm with greater functionality and better dexterity. This can enable the user to perform a wider range of tasks, and improve their quality of life. Better control: Advanced bioengineering technology can enable better control of the prosthetic arm, allowing the user to perform complex movements and tasks more easily. More natural movement: Bioengineering technology can make the prosthetic arm movement more natural, mimicking the movement of a real arm. This can make the user feel more comfortable and confident when using the prosthetic arm. Better integration: Bioengineering technology can help the prosthetic arm to integrate better with the user's body, making it feel more like a natural extension of the body.	Cost: Bioengineering technology can be expensive, which can make prosthetic arms that incorporate it more costly. Maintenance: Bioengineering technology can require more maintenance and upkeep than simpler prosthetic arms, which can be an inconvenience for some users. Complexity: Bioengineering technology can make the prosthetic arm more complex, which can make it more difficult for some users to operate. Availability: Bioengineering technology is not yet widely available, which can limit access for some users, particularly those in developing countries or with limited financial resources
	**Braincomputer interface (BCI) Neuralink** imbedded inside the brain and allows for control of devices outside of the body	Brain computer interface allows for the user to seamlessly control a device with thoughts. This is an important factor as our body parts are also controlled through thoughts. This technology can allow the user to control their artificial limb as if was their own and a true extension of their body. Communication to the device but the device can also communicate to the brain: gaining "feeling" in the hand when the device sends signals back to the brain.	The device is implanted in the brain making it a destructive process (irreversible, or very difficult to go back) It could have severe side effects if anything goes wrong Problem with merging mechanical parts and biological body parts together: going to cyber psychosis as seen in cyberpunk edge runner
	**Compliant screens** Screen that are flexible and can take many snap and form	Flexibility: This allows them to be bent and curved to a certain degree without breaking. Durability: Bendable screens are generally more durable than traditional rigid screens because they are made out of plastic and not glass, making them less likely to break. Portability: Bendable screens can be rolled up or folded, making them more portable and easier to transport than traditional screens. Better User Experience: Bendable screens offer a better user experience by allowing for a more immersive and interactive experience, particularly in gaming and video applications.	Implementing a screen could make the prosthetic as a whole less durable due to it's delicate nature Limited Image Quality: Bendable screens may not offer the same image quality as traditional screens, particularly in terms of resolution, brightness, and contrast.
	**DNA Storage** Imbedded inside the brain and allows for control of devices outside of the body	High storage density: DNA has a very high storage density, which means that a large amount of information can be stored in a very small space. This could be especially useful in prosthetic devices where space is limited. Security: DNA data storage can be highly secure, as it is not vulnerable to hacking or other types of cyber attacks that are common with electronic storage methods.	Limited read and write speeds: DNA data storage has relatively slow read and write speeds compared to electronic storage methods. This could make it less useful for storing information that needs to be accessed quickly.
	Artificial Intelligence Imbedded inside the brain and allows for control of devices outside of the body	Enhanced Functionality: AI can enhance the functionality of prosthetic arms by providing greater control and precision of movements, allowing for more natural and intuitive movements. AI can detect and respond to objects or obstacles in the environment, and adjust the grip or movement accordingly. Personalisation: AI can be personalised for the user, and help the user in task and needs. Skillset: With the AI's ability to learn vast amounts of information almost instantly, users could even perform tasks they have never learned, such as playing a musical instrument.	Risk of malfunction and possibility of hurting the user Potential for the AI to be hacked or misused.
 	**Nanorobotics** Any sort of material designed and engineered at the nanometer scale for a specific task is a smart material. If materials could be designed to respond differently to various molecules, for example, artificial drugs could recognize and render inert specific viruses. Self-healing structures would repair small tears in a surface naturally in the same way as human skin.	Enhanced Functionality: AI can enhance the functionality of prosthetic arms by providing greater control and precision of movements, allowing for more natural and intuitive movements. AI can detect and respond to objects or obstacles in the environment, and adjust the grip or movement accordingly. Personalisation: AI can be personalised for the user, and help the user in task and needs. Skillset: With the AI's ability to learn vast amounts of information almost instantly, users could even perform tasks they have never learned, such as playing a musical instrument.	Enhanced Functionality: AI can enhance the functionality of prosthetic arms by providing greater control and precision of movements, allowing for more natural and intuitive movements. AI can detect and respond to objects or obstacles in the environment, and adjust the grip or movement accordingly. Personalisation: AI can be personalised for the user, and help the user in task and needs. Skillset: With the AI's ability to learn vast amounts of information almost instantly, users could even perform tasks they have never learned, such as playing a musical instrument.
  	**Magnetic levitation** Magnetic levitation (maglev) or magnetic suspension is a method by which an object is suspended with no support other than magnetic fields. Magnetic force is used to counteract the effects of the gravitational force and any other forces. aglev (derived from magnetic levitation), is a system of train transportation that uses two sets of electromagnets: one set to repel and push the train up off the track, and another set to move the elevated train ahead, taking advantage of the lack of friction.	Improved Mobility: Magnetic levitation technology can allow for smoother and more natural movements of the prosthetic limb, improving the mobility of the user. Reduced sound: Magnetic levitation technology allows for less friction meaning robotic sound can be avoided.	Technical Complexity: The integration of magnetic levitation technology can make the prosthetic limb more technically complex, making it harder to manufacture and repair. Limitations: Magnetic levitation technology may have limitations in terms of the weight and size of the prosthetic limb that can be supported, which could limit its application in certain cases. Safety Considerations: Magnetic levitation technology may pose safety considerations, such as interference with pacemakers or other medical devices, which may need to be carefully managed.

SOFT ROBOTICS

Soft robots are made of flexible materials. Their compliance and adaptability enable them to navigate complex spaces and interact safely with humans.





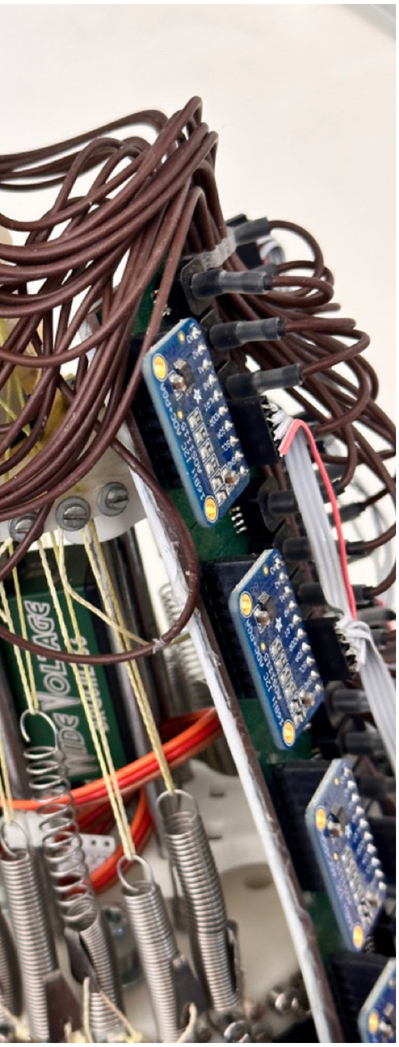
Soft robots have unique abilities because they are made of flexible materials.
Soft robots can bend, stretch, twist, and deform their bodies, allowing them to adapt to different environments and navigate through complex and confined spaces that may be inaccessible to rigid robots. Soft robots are safe to interact with, especially around people and delicate objects. They can move in various ways like crawling, swimming, or hopping. Soft robots can imitate the movements of living things. Overall, soft robots are flexible, safe, adaptable, and capable of performing a wide range of tasks.

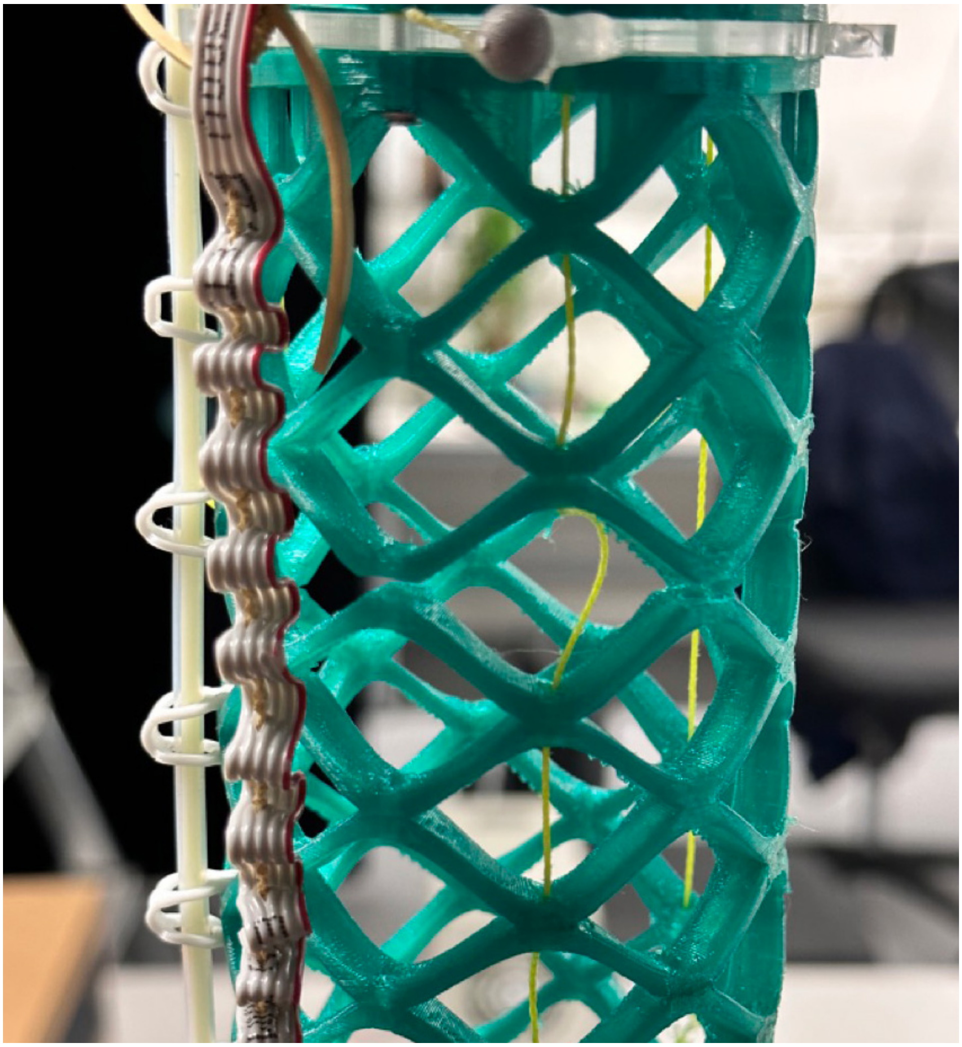
I am utilizing soft robotics technology in my vision because its unique characteristics make it highly suitable for prosthetics.

VISIT AT THE EPFL

Based in Lausanne (Switzerland), EPFL is a university whose missions are education, research and innovation.

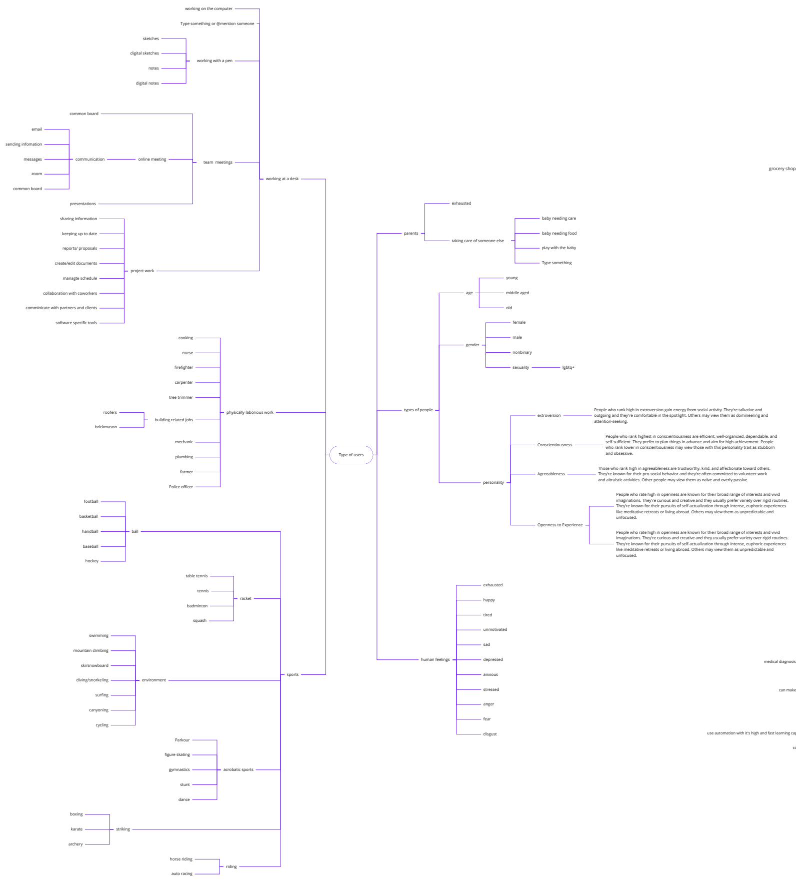
During my visit to the soft robotics lab at EPFL, I had the opportunity to explore their innovative projects. One area of particular interest to me was the utilization of pattern used to design compliant robots.

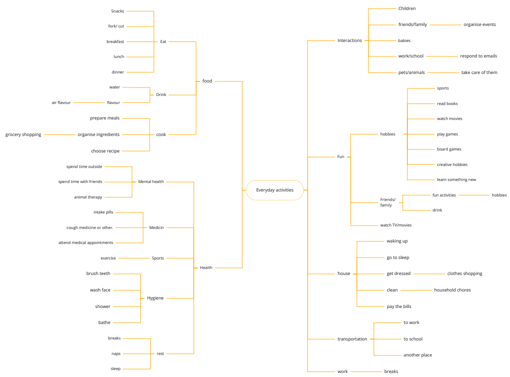


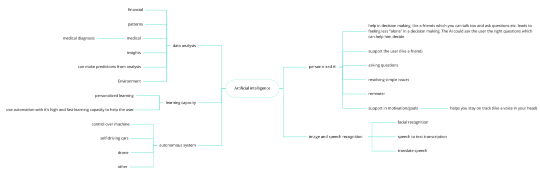


CONCEPT BRAINSTORM

In this chapter, we delve into the creative brainstorming process of envisioning future concepts for prosthetic devices.







As described in the goal of "Prosthetic in a New Light," my objective is to shift the perception of prosthetics from potential shame to admiration. I envision prosthetic devices that not only enable individuals to interact and connect with others but also possess additional abilities that captivate the user and others.

To explore the possibilities, I have created a mindmap that covers the diverse range of daily activities people engage in today. From there, I have identified various potential concepts for prosthetics that support these activities.

CONCEPT BRAINSTORM

The realm of possibilities and concepts seemed boundless. It proved challenging to determine the optimal concept and the ideal integration of abilities and personalization within the prosthetic device.

I decided to focus on a prosthetic vision that would seamlessly fit into the daily lives of future individuals, catering to the needs of an average person. Not only did I consider future usage, but I also to inspire the technological developments of today.

Centring my concept on the future user's daily life, I explored how our reliance on smartphones and engagement with cyberspace would evolve. I envisioned a future where screens would no longer dominate, as we would immerse ourselves in augmented and virtual 3D realities effortlessly, rendering traditional phones obsolete. The utilization of cyberspace would become an immersive, three-dimensional experience.

In this new reality, the question arises: How can we give the user an advantage within this immersive cyberspace?

The newly created mind map provides an overview of the concept I am pursuing. This stage of the concept is however not a perfect match with the final result.

- personalisation
  - base model personalisation: this personalisation is made when ordering the arm The personalisation is permanent.
    - Protection feature
      - taser
      - knife
      - other
    - soft robot
    - specialized sensors
    - Color
  - additional feature personalisation: with separately obtainable features, the cybernetic enhancement can have additional features which can be deployed when used.
    - Hand type
      - medical instruments for doctors
    - small personalisation
      - Charging station for headphone
      - protection feature
    - large personalisation
      - gamer controls
      - water propulsers
      - charging station for VR/AR asset
      - protection feature

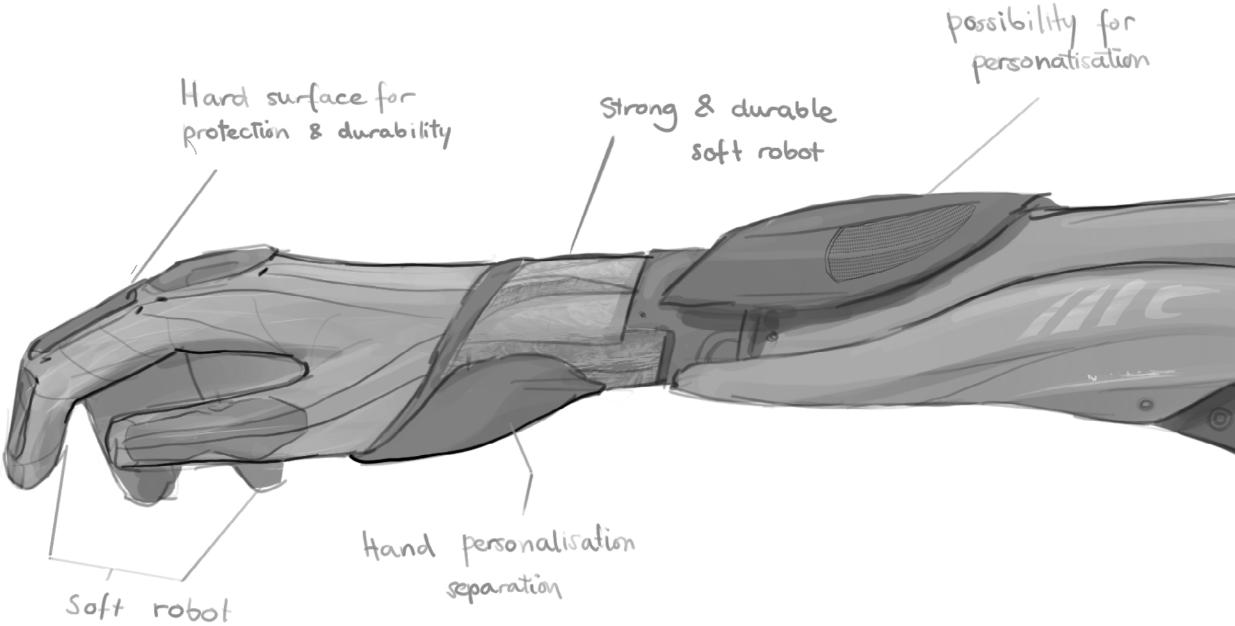
- type of robot
  - bot
  - hard robot

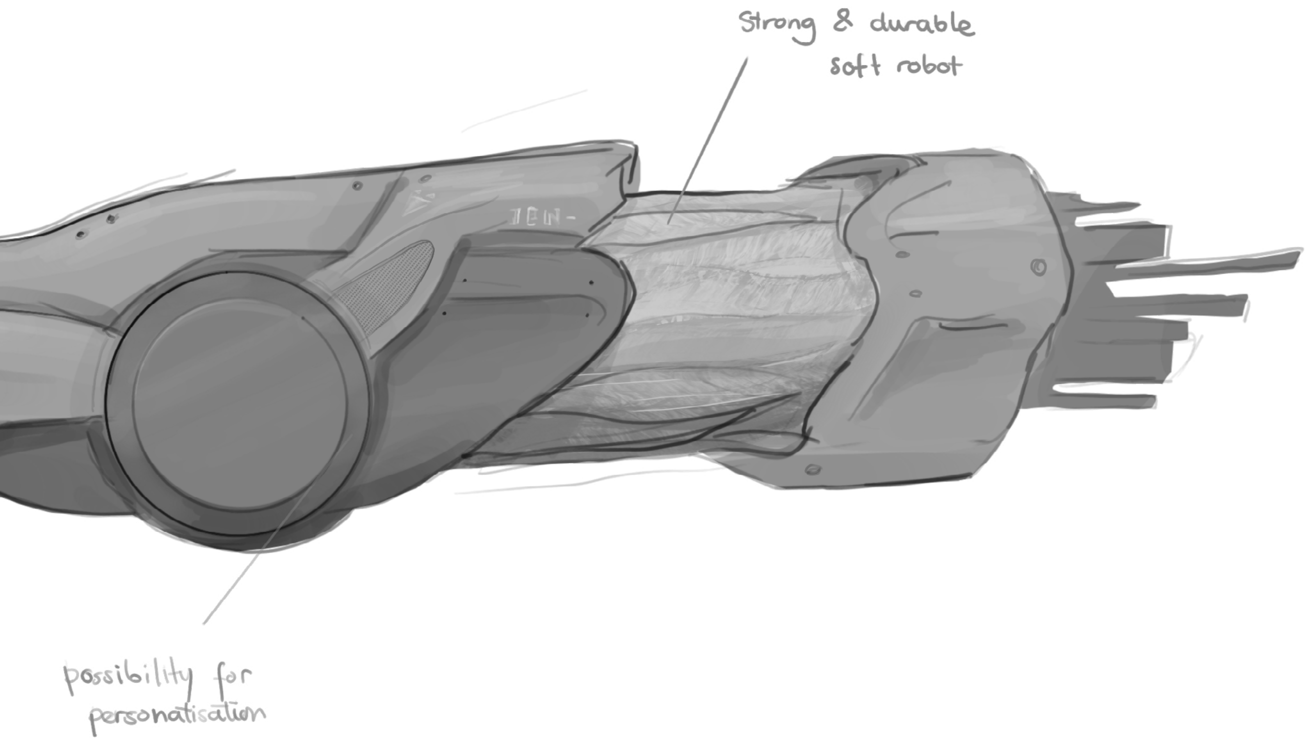
- Form
  - The form of the human hand is kept. The human learn how to use the hand from birth and it is a fine motor which is perfected for years. Unlike the leg, which can be designed is many forms, because the known movement of walking stays the same. In the arm however, the upper arm can have a very different form from the human body, as it does not change the way the arm moves.
  - Biological bodies has had millions of years of evolution to perfect itself, and creating robots is an attempt at replicating these bodies. Scientists and designers often turn to nature for inspiration to create the best version of their project.
  - Humans have evolved beyond living with nature and it's simple tools. Which is why human technology will overcome the biological body.
  - The interaction with other living being is important. It is crucial for other to be able to feel/make a connection with the user when interacting with the cybernetic enhancement
- energy
  - The kinetic energy is stored as a power source

- Digital features
  - l
  - t
  - t
  - r

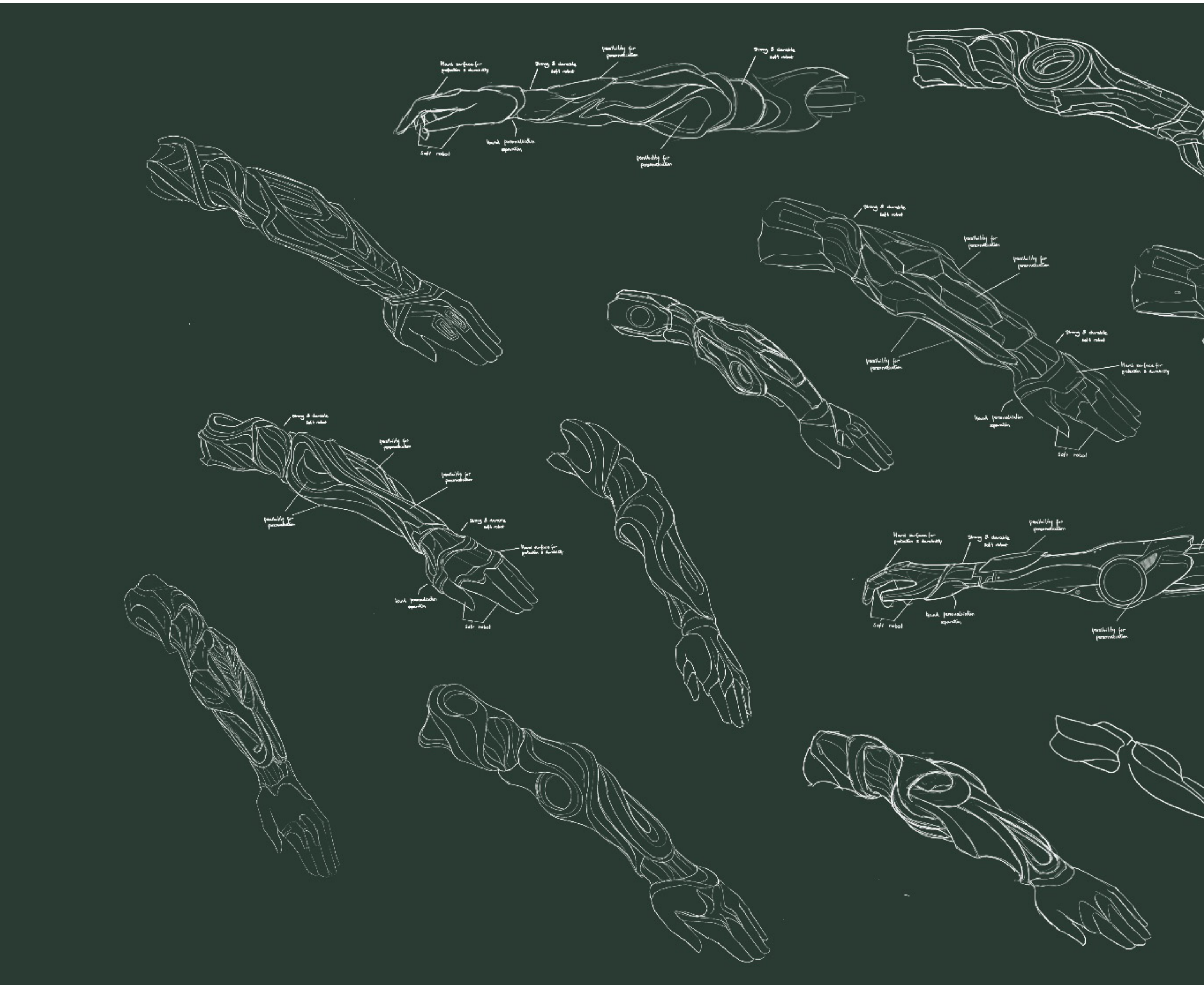
COMPOSITION OF AION

Blending Soft and Hard Robotics: Designing the structur of the prosthetic



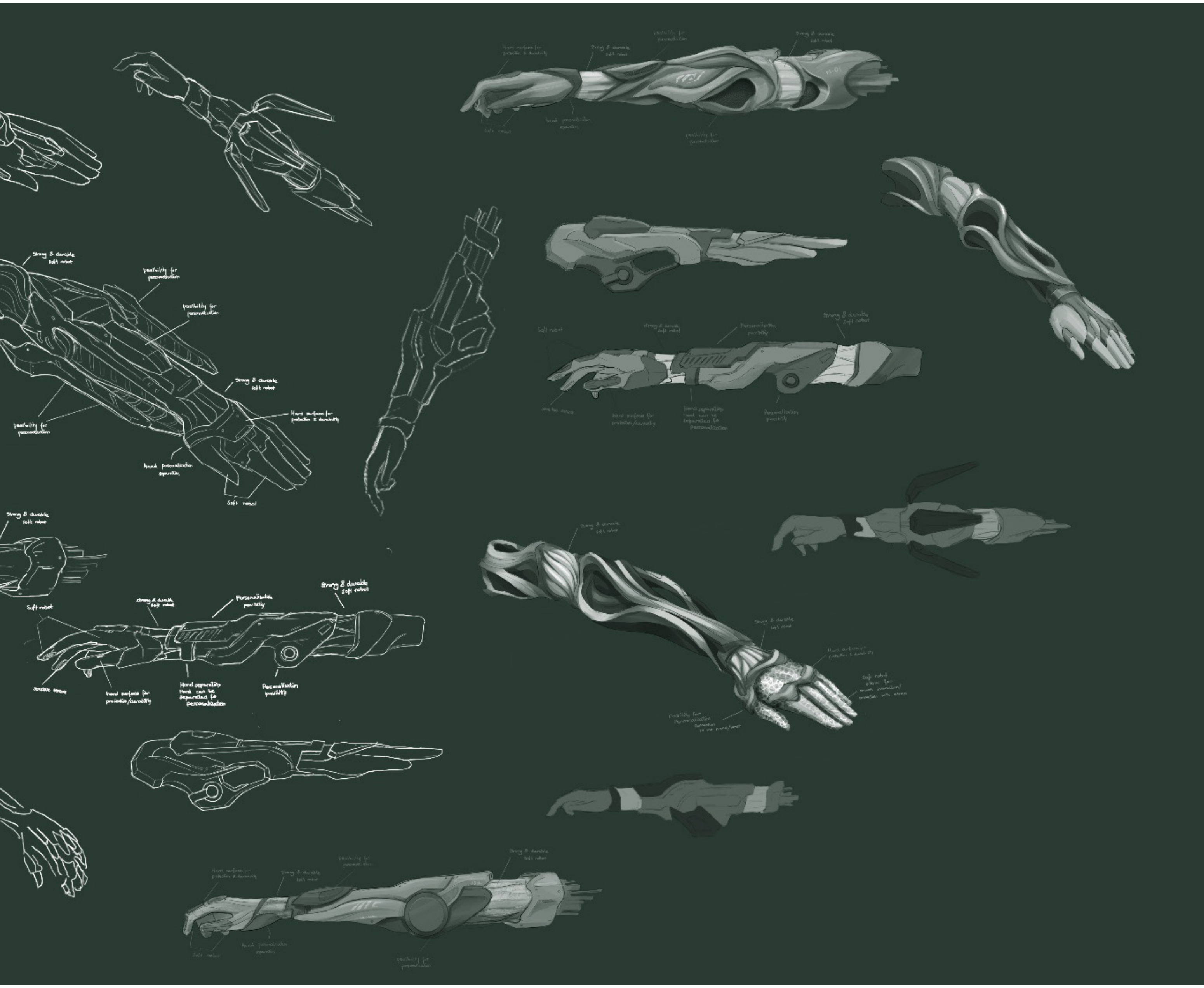


The prosthetic I have developed incorporates both soft robotics and hard robotics to ensure hardware protection. The structural design of the prosthetic embraces various levels of material compliance, each serving specific purposes. For instance, the hand component is intentionally softer, allowing for natural and comfortable interaction with others. This careful integration of soft and hard elements in the prosthetic's structure enhances its overall functionality and usability.



FORM LANGUAGE

Experimenting with different design form languages.

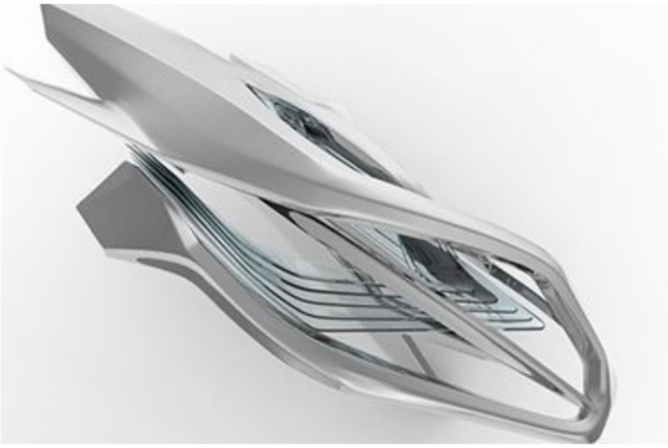


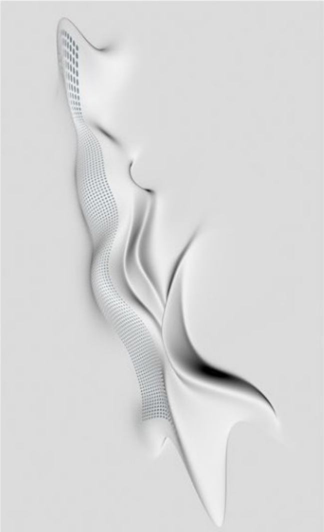
With a broad moodboard, I freely explore different forms to identify the most suitable design language for a futuristic prosthetic. In this process, I left all constraints behind to truly experiment in different directions.

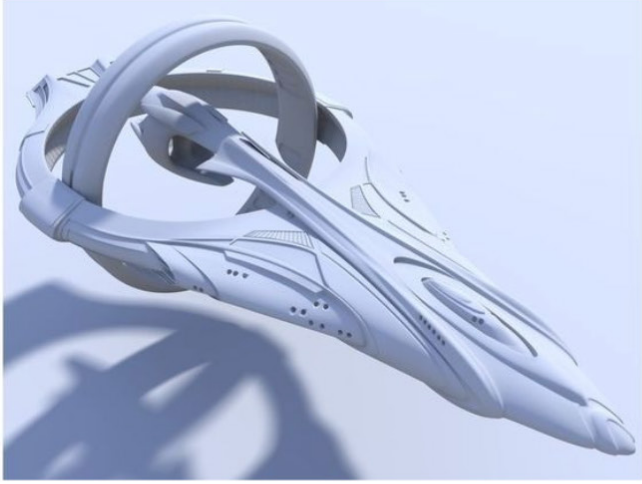
FORM LANGUAGE

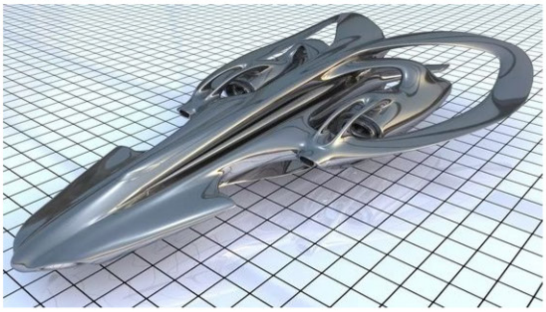
I have decided to adopt an organic design language that aligns with the project's concept and futuristic vision. The form of the product is inspired by biological organisms, symbolizing the user and the soft robotics technology. This design language also reflects my vision of a future where we prioritize environmental sustainability.

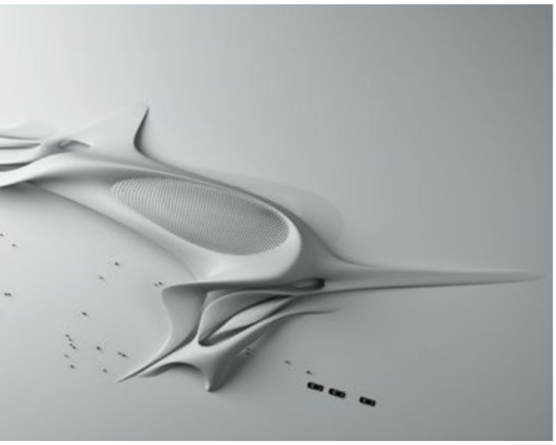
I've selected a green hue for the prosthetic to enhance the overall concept. This colour fosters feelings of tranquillity and establishes a link with the natural world.



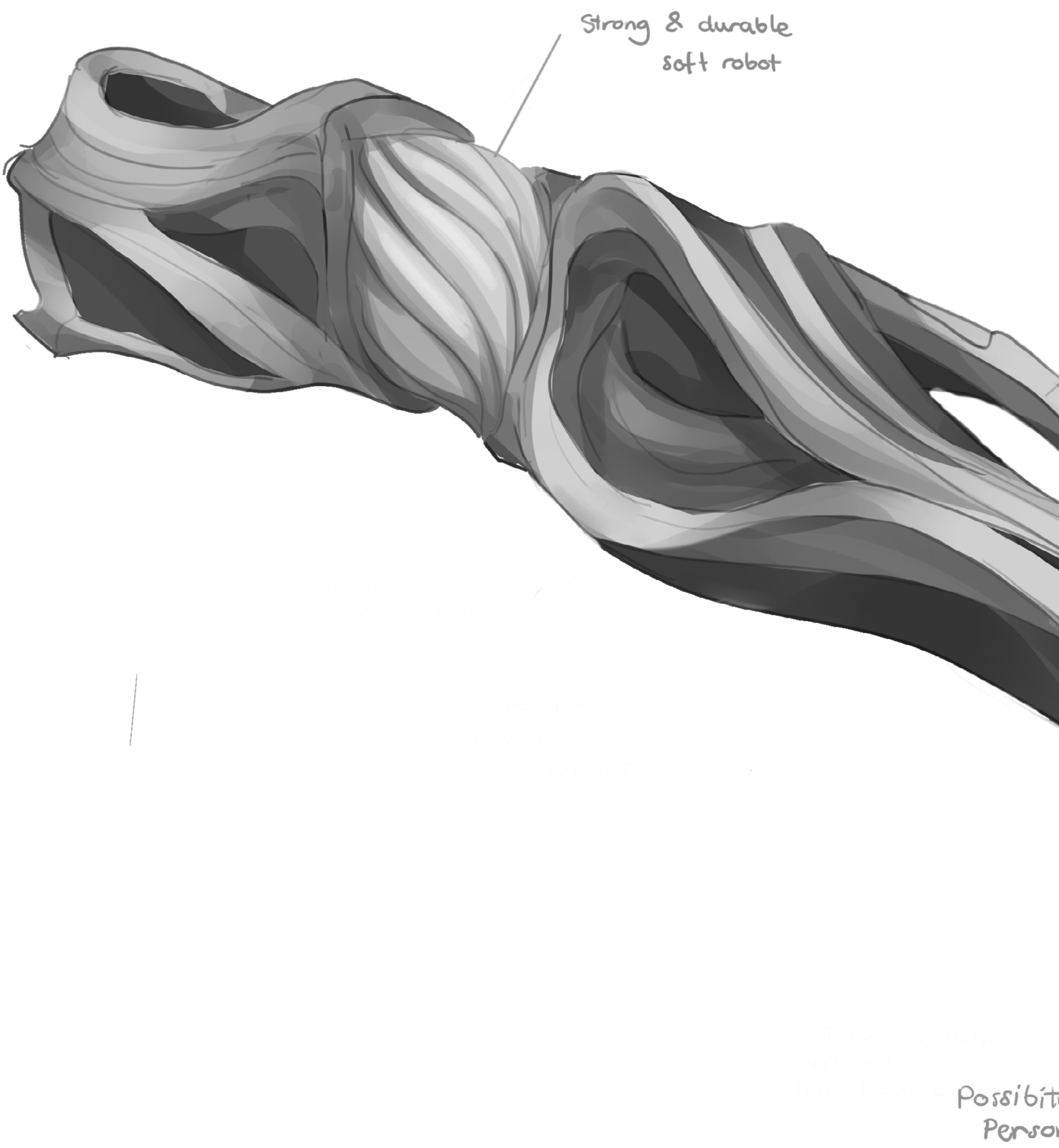


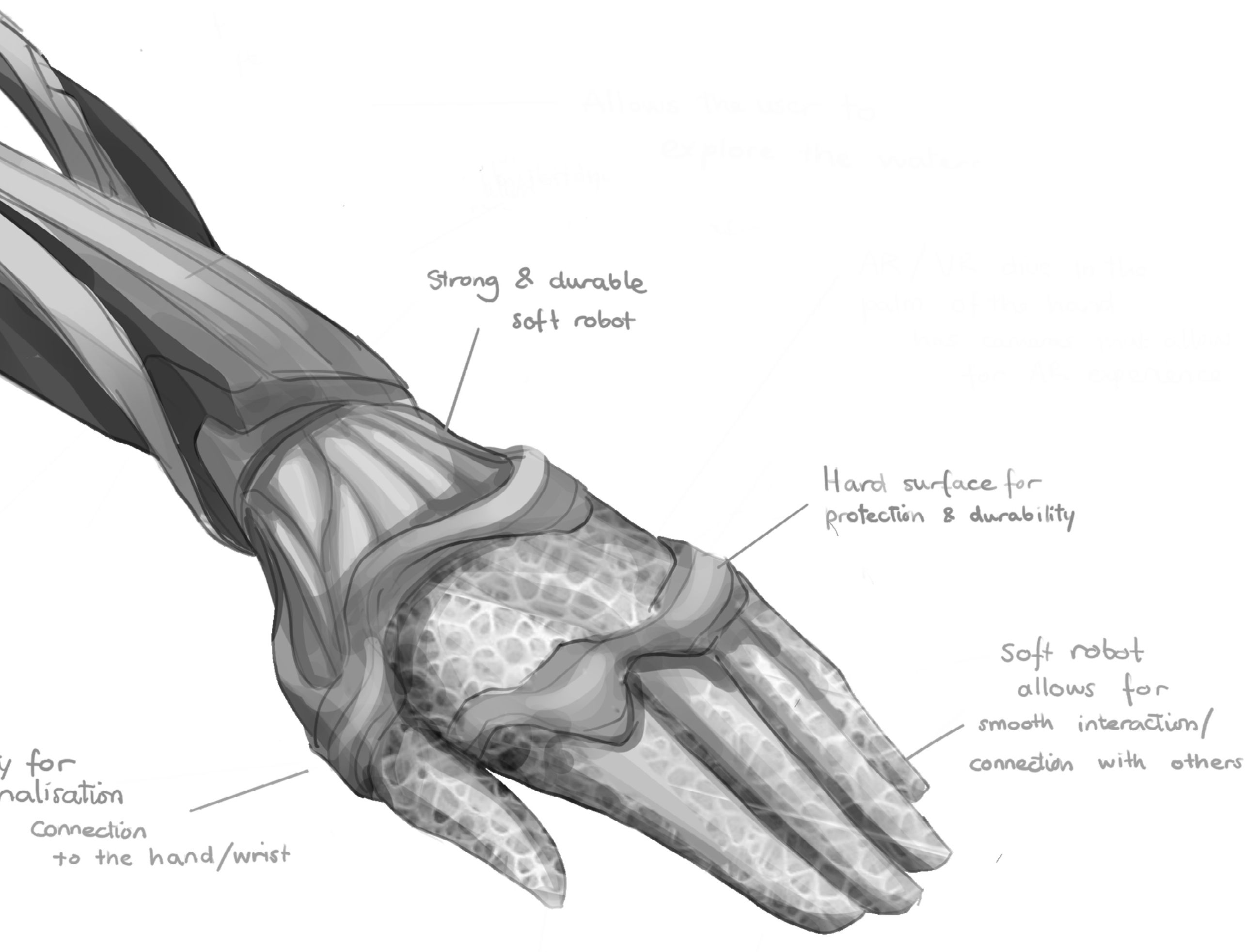


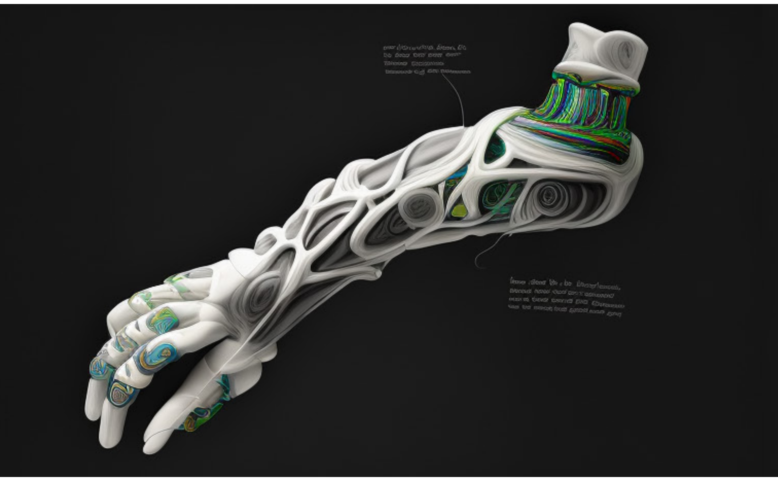
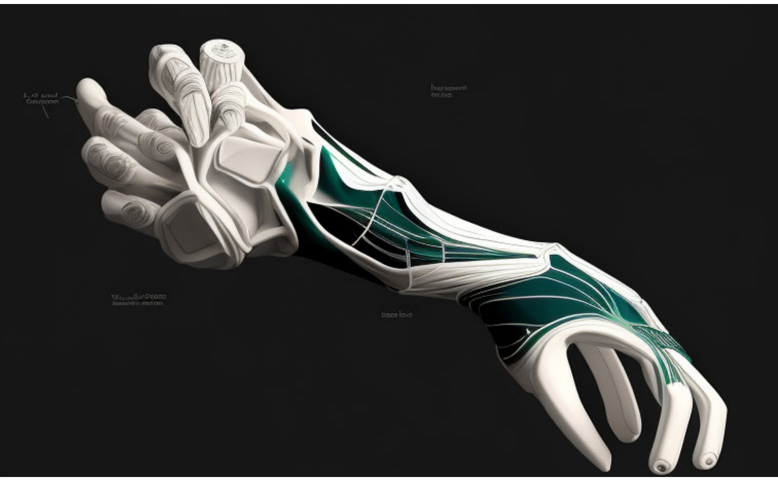
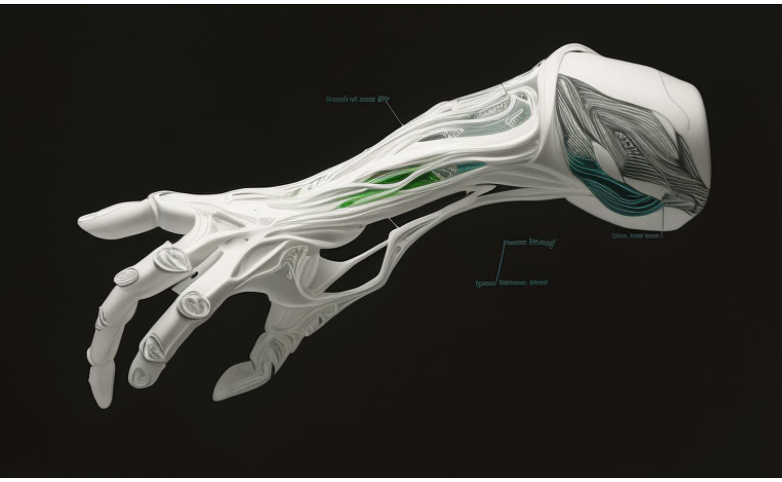
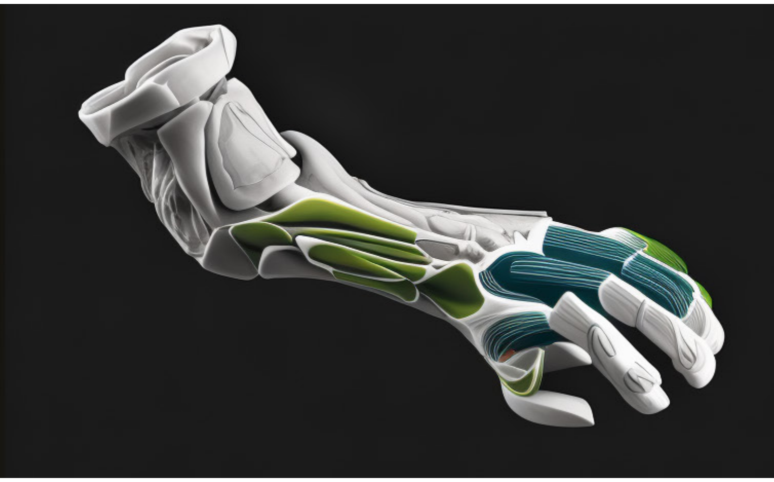




FORM LANGUAGE

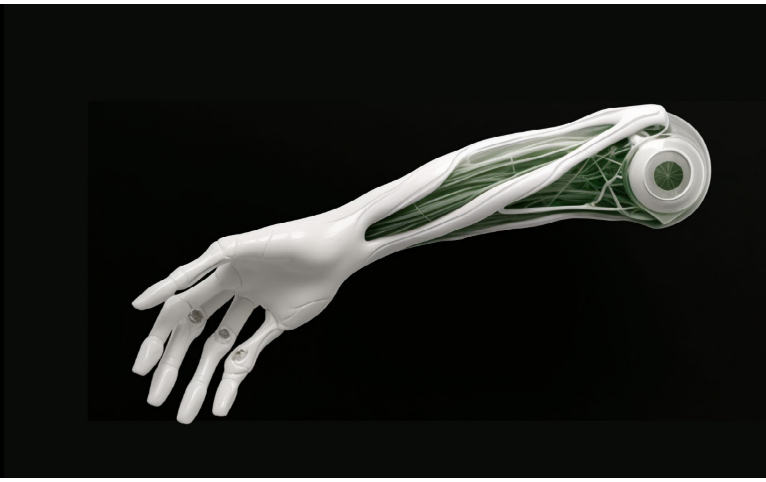



Strong & durable
soft robot
Hard surface for
protection & durability
Soft robot
allows for
smooth interaction/
connection with others
y for
nalisation
Connection
to the hand/wrist

VISUALISATION OF IDEAS WITH AI

I explore the use of AI to create hyper-realistic visualizations of my ideas. With the help of AI and my sketches, I was able to generate incredibly detailed images that brought my concepts to life in a way that traditional methods could not.



To generate hyper-realistic images of my prosthetic design ideas, I used AI-powered image generation tools. I started by inserting some of my sketches and writing a text prompt which helps the AI understand what I want to visualize.

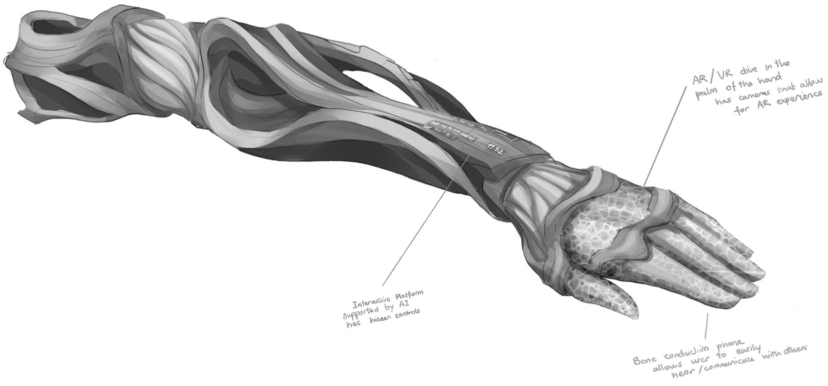
Text prompt example: “An upper human body with a prosthetic arm that has organic forms, it mimics the shape and movement of a human arm, The design should be sleek and modern, with a combination of white and dark green colours that give it a sophisticated and elegant appearance, The color scheme should be inspired by the natural world, with the dark green resembling the colour of leaves and the white representing the purity and simplicity of nature, The image should showcase the functionality of the arm while also highlighting its aesthetically pleasing design, providing users with a sense of confidence and empowerment as they go about their daily activities, hyper-realistic, 4k, --ar 3:2”

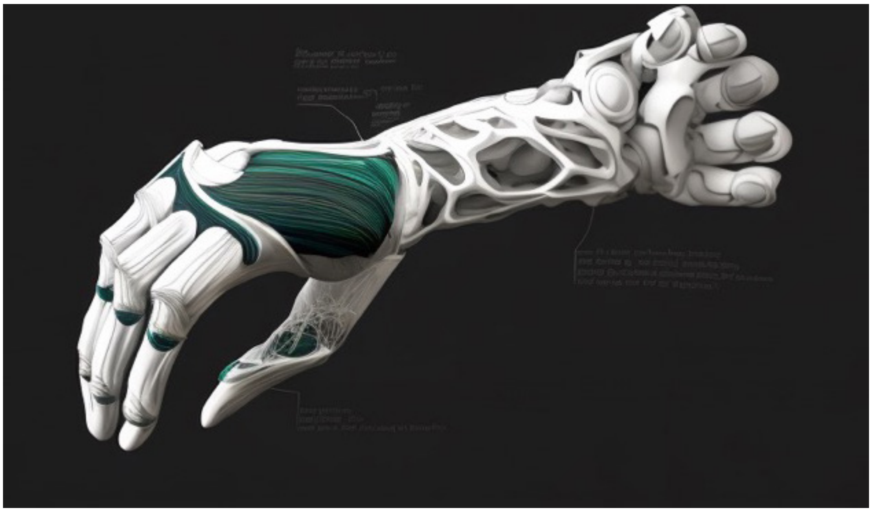
The AI will proceed to generate four images. If I like one of the images, I can create variations of the same image. In creating variations, the AI will tweak small details on the design keeping the overall look of the first generated image.

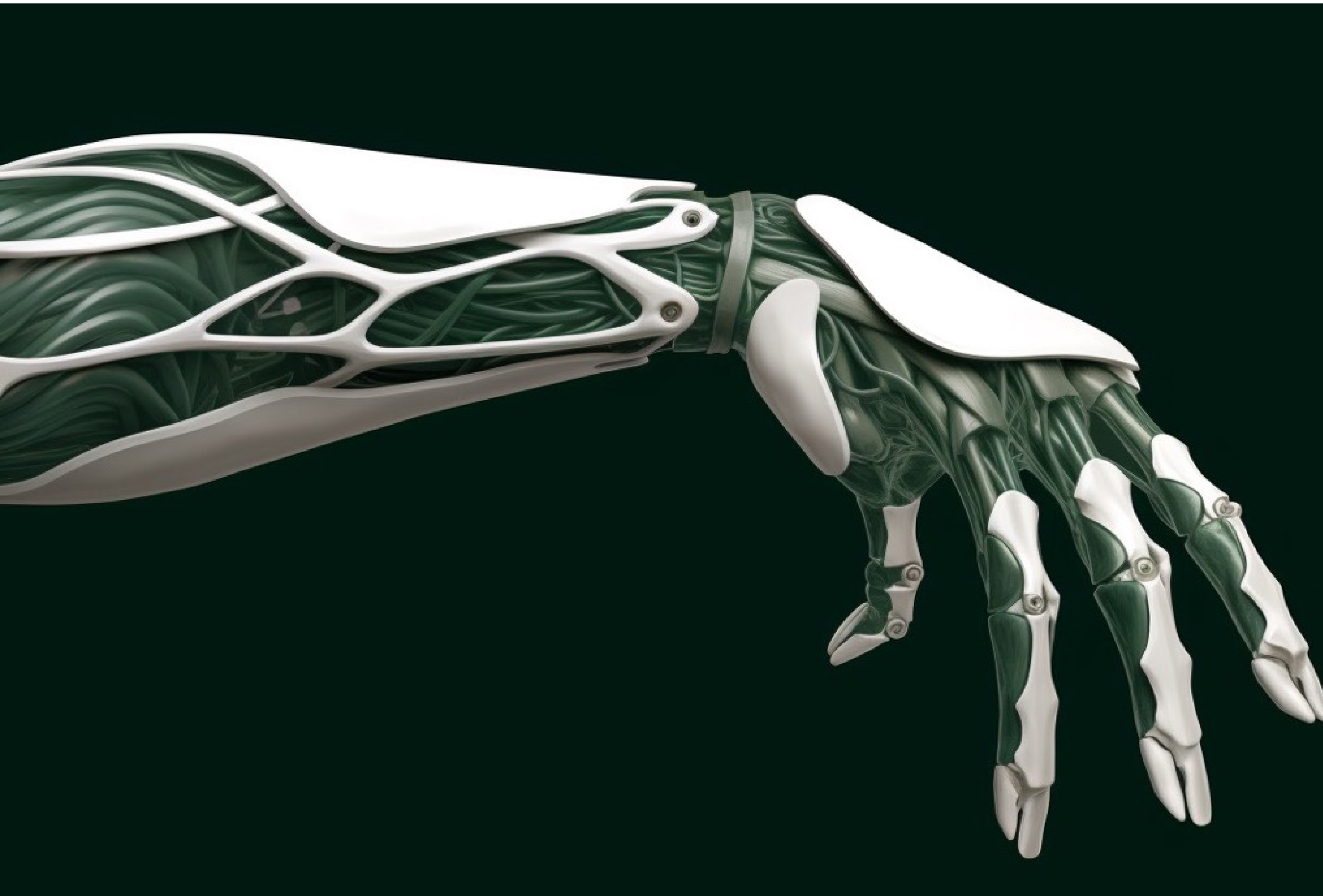
Finally, I can use the upscaling tool to enhance the resolution and detail of the images for a more refined and polished result.

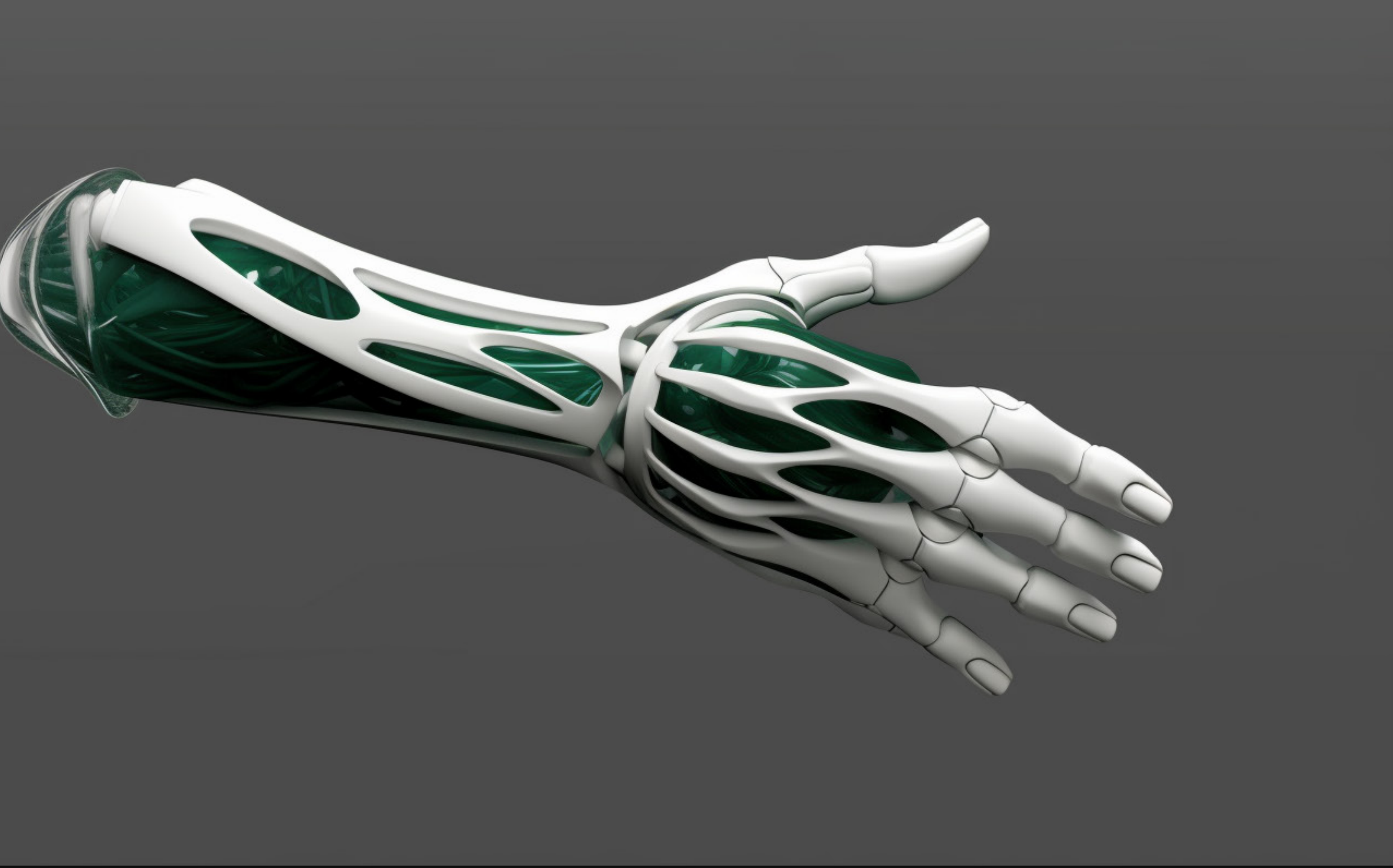
VISUALISATION OF IDEAS WITH AI

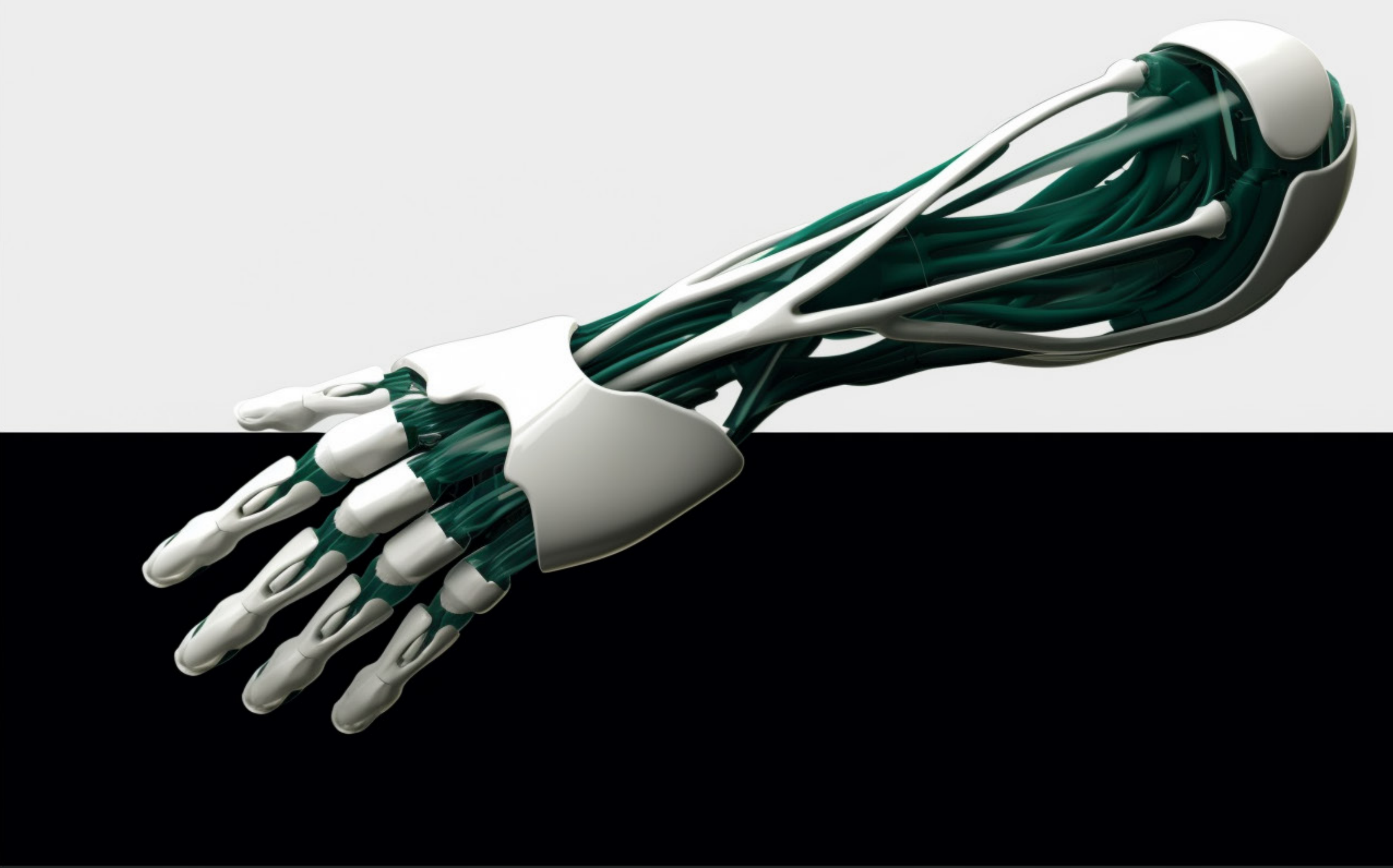
Initially, the visual representation of my ideas generated by AI was chaotic and often lacked resemblance to an arm or hand. However, by combining my sketches, the generated images and different prompts, I was able to refine and evolve my designs into captivating and intriguing concepts. In the end, I generated over 200 pictures.

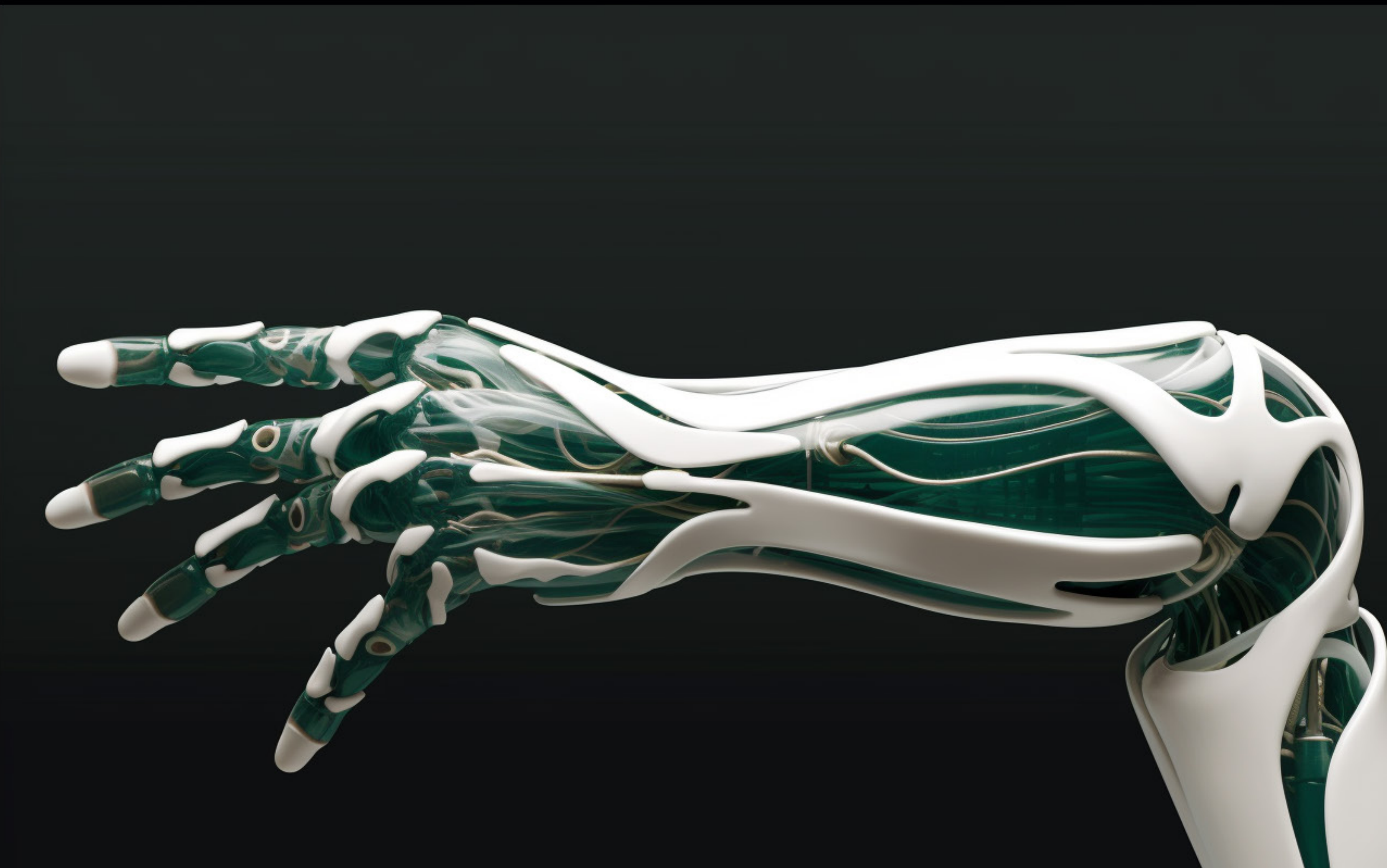


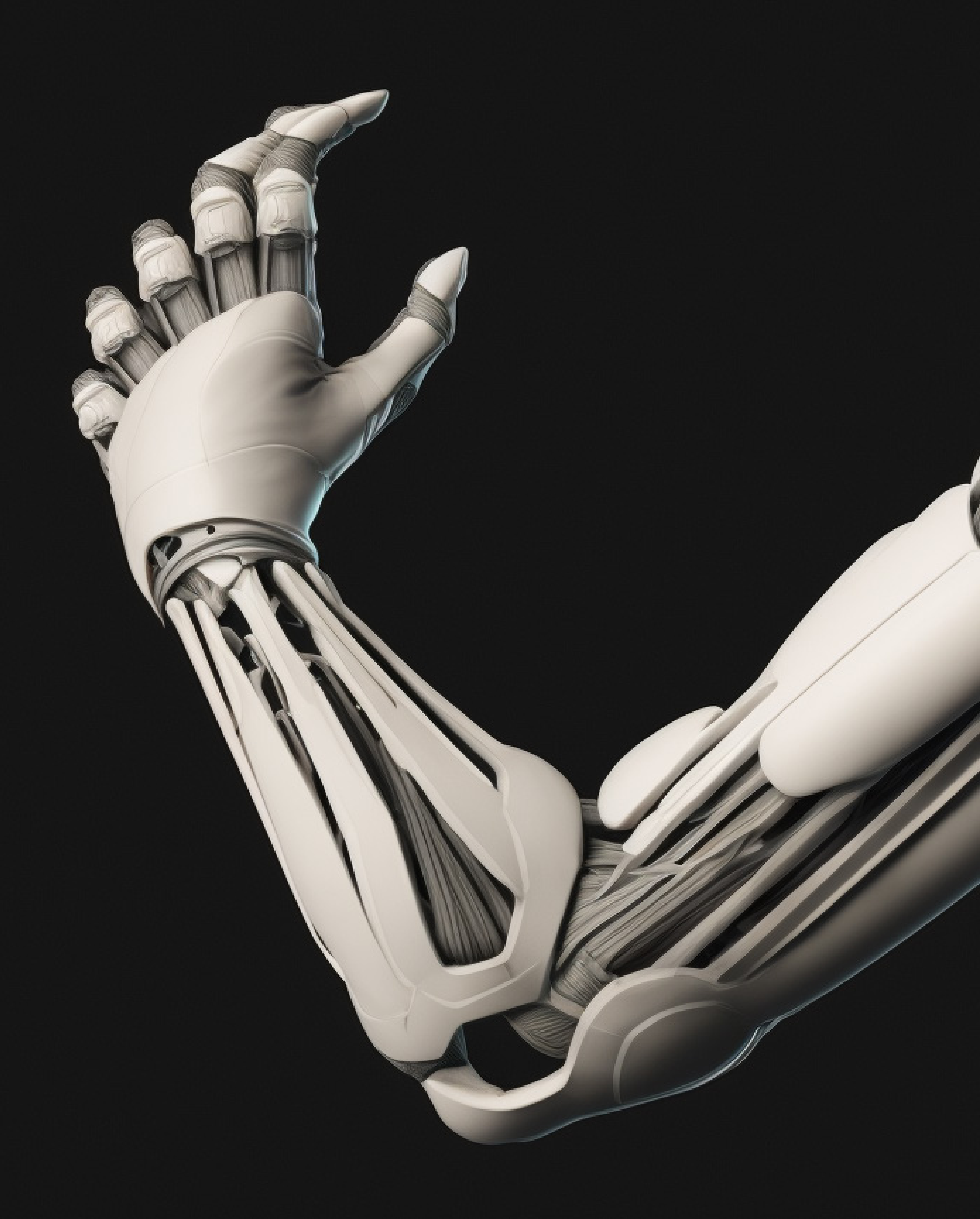


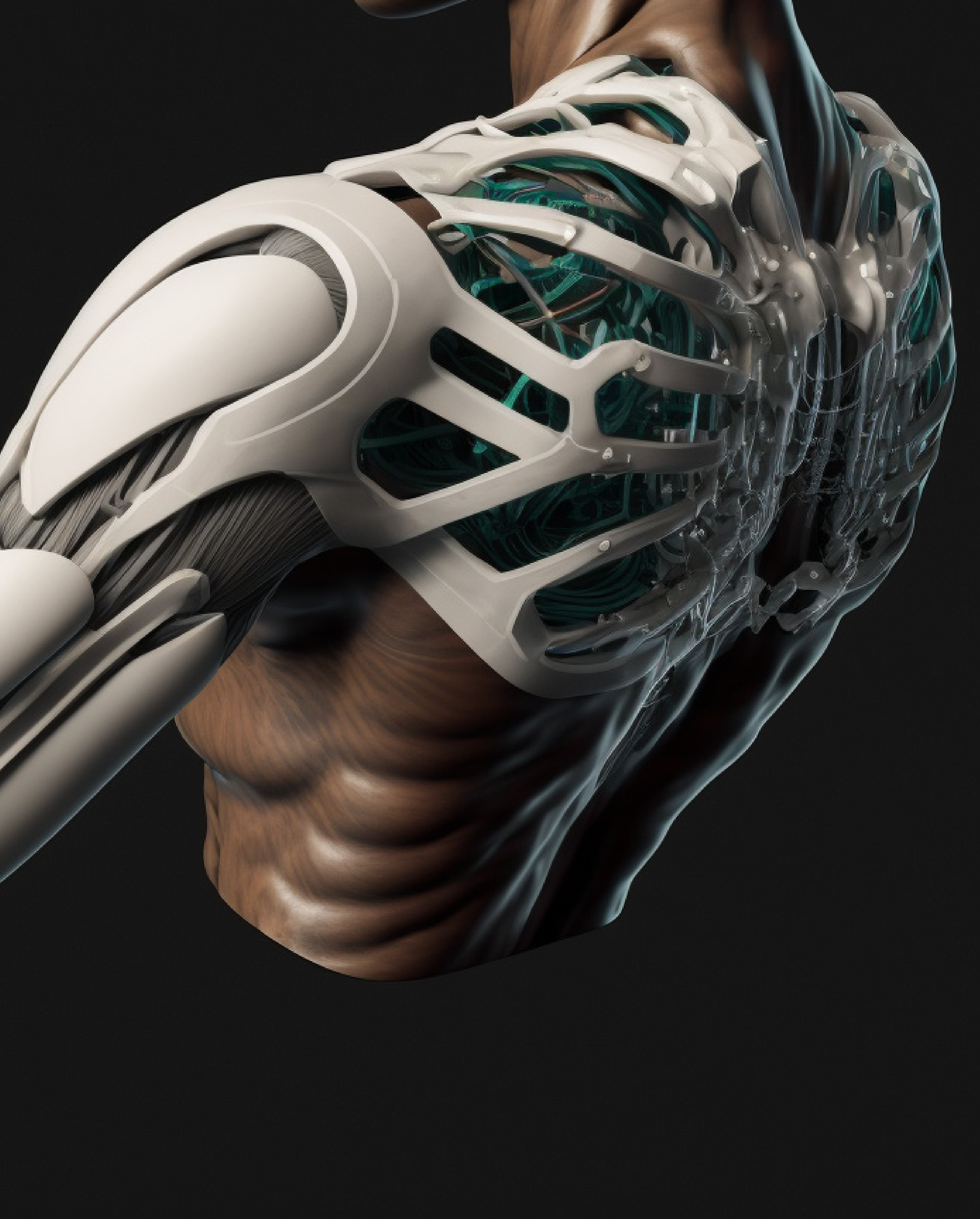


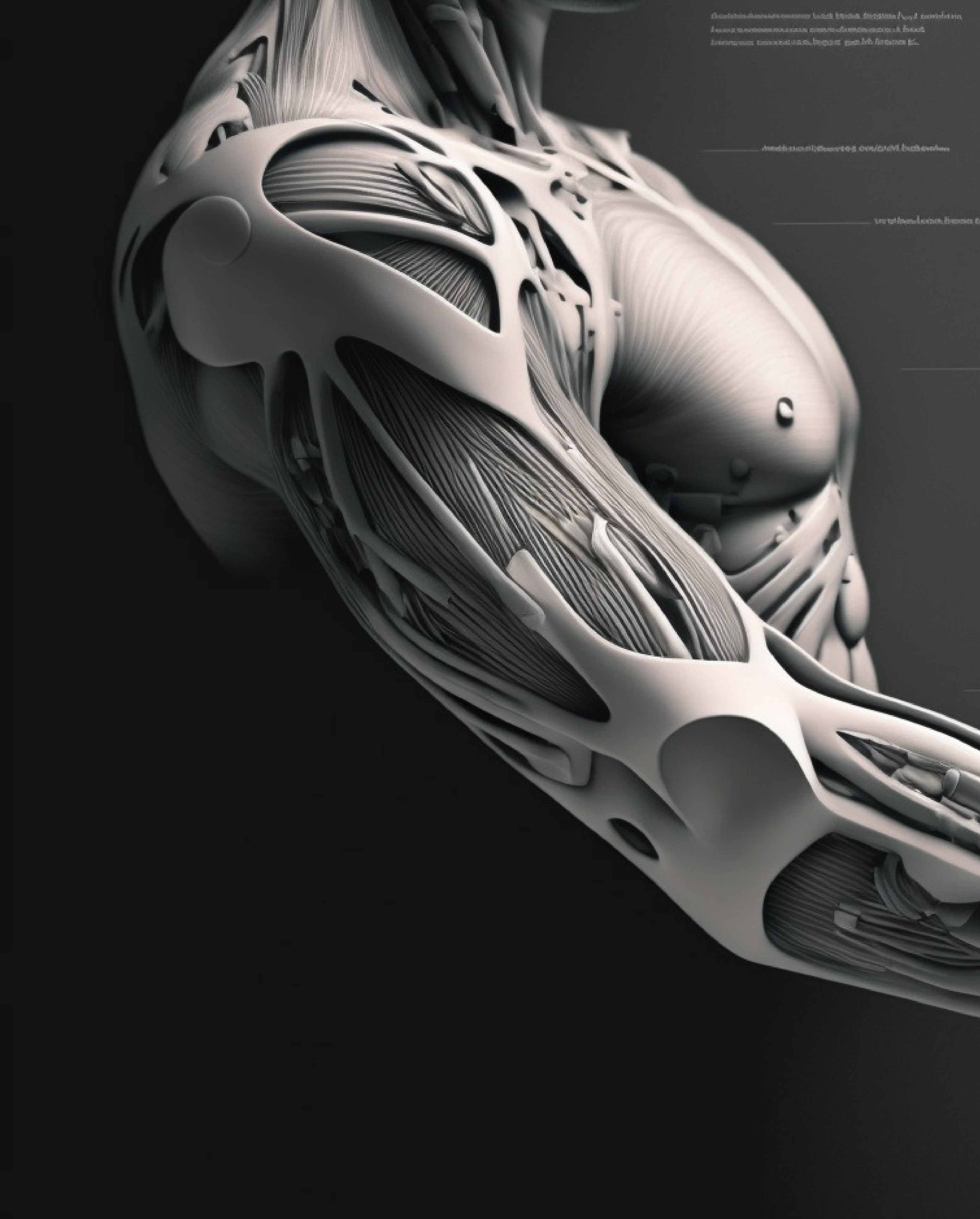


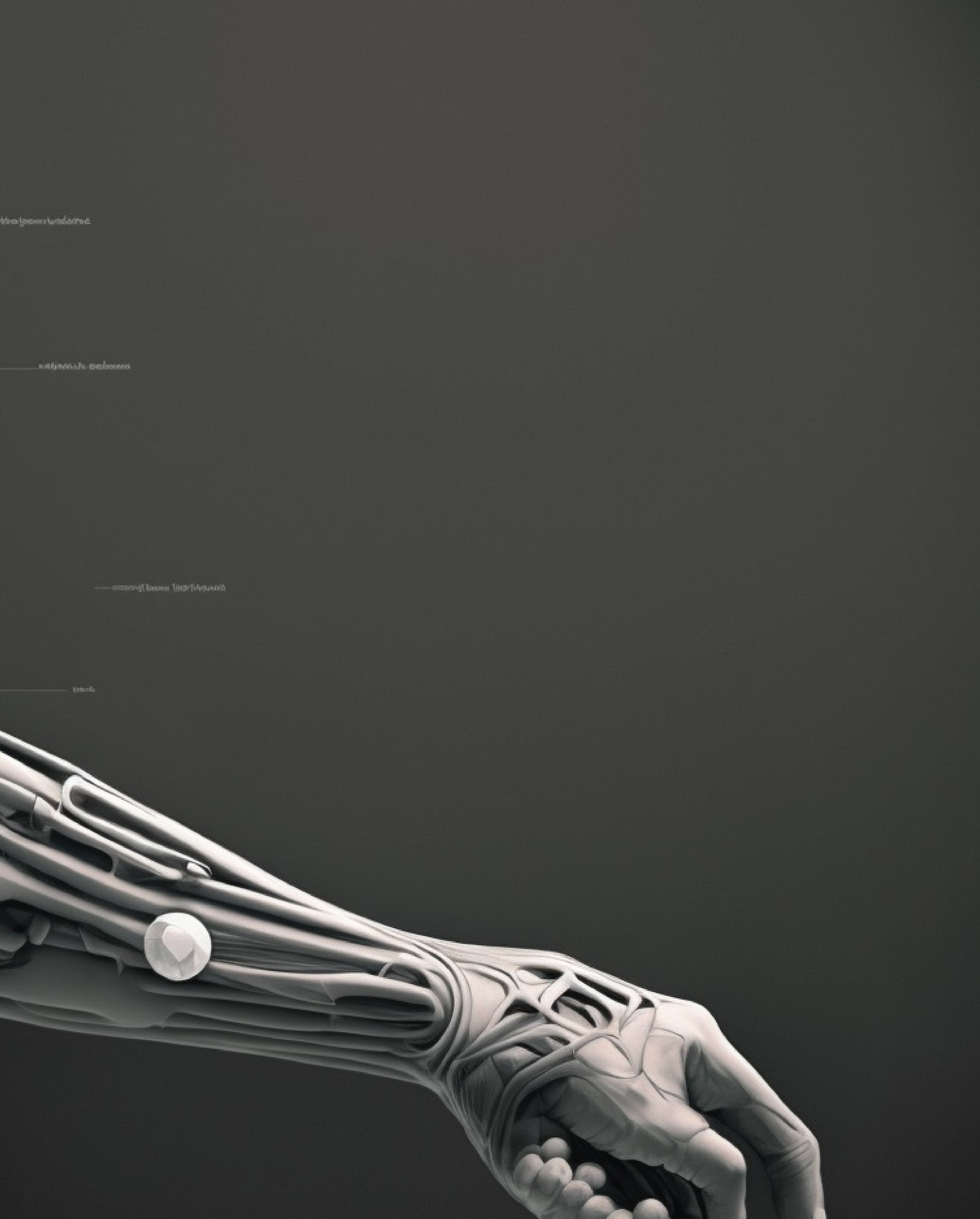



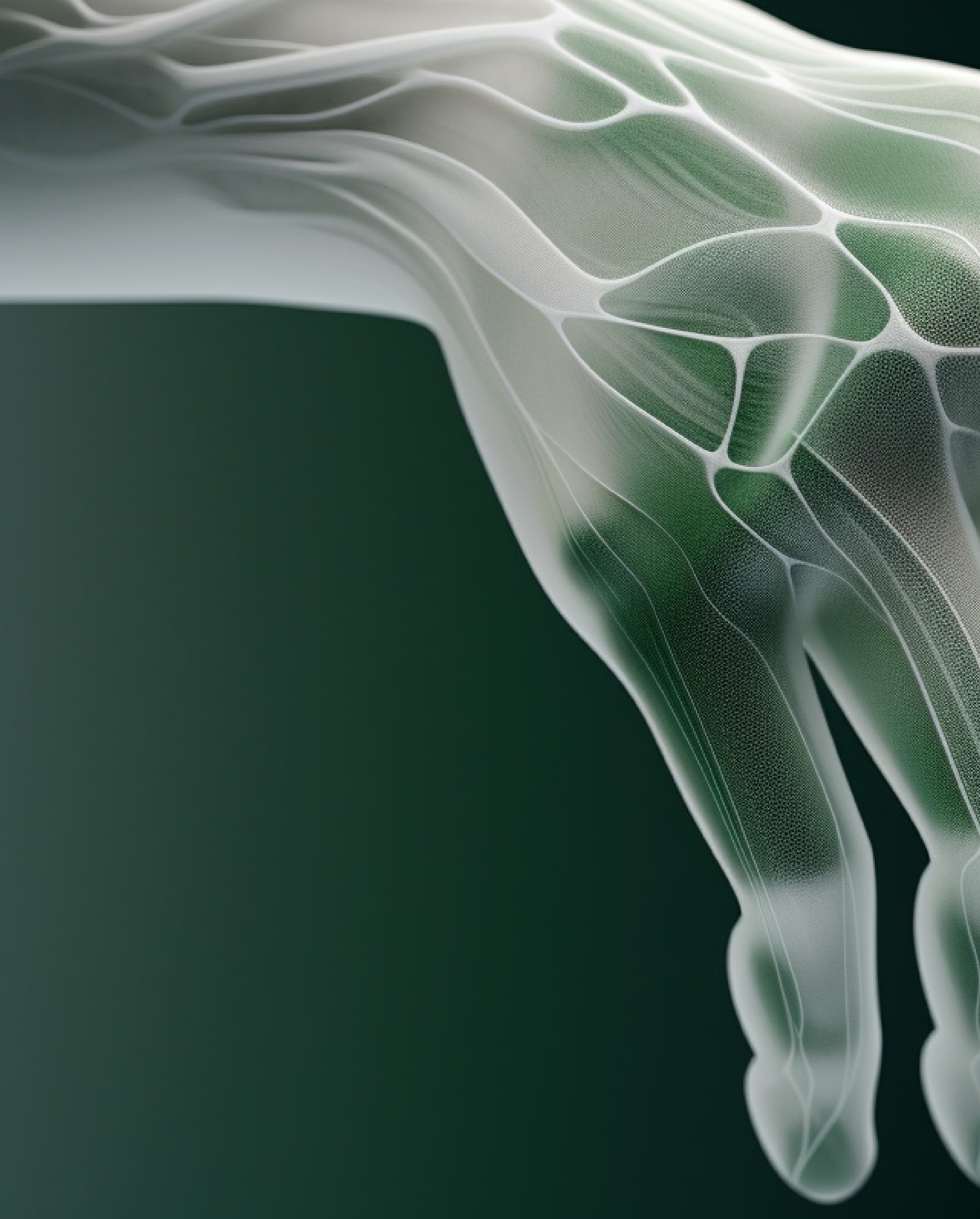


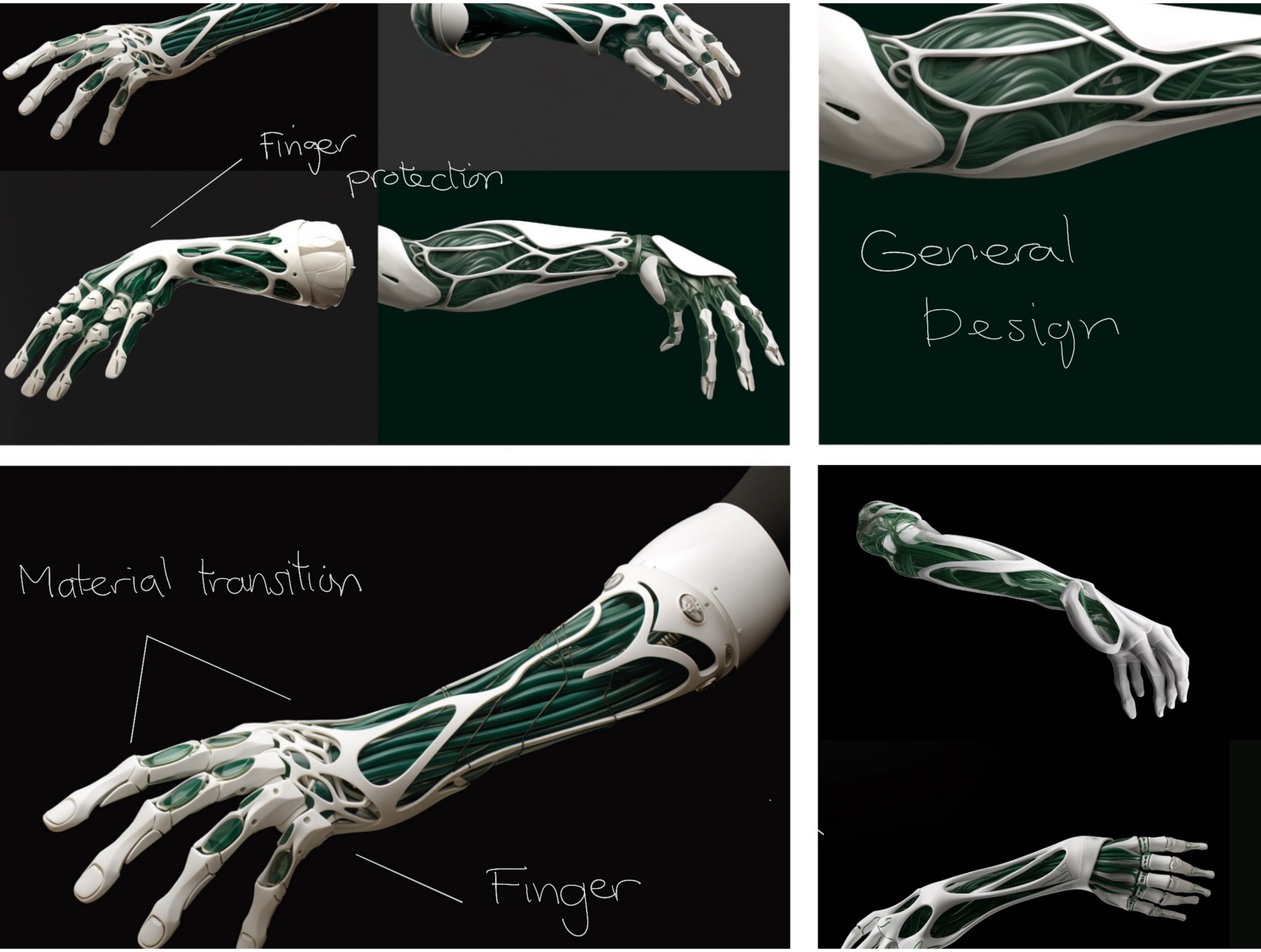




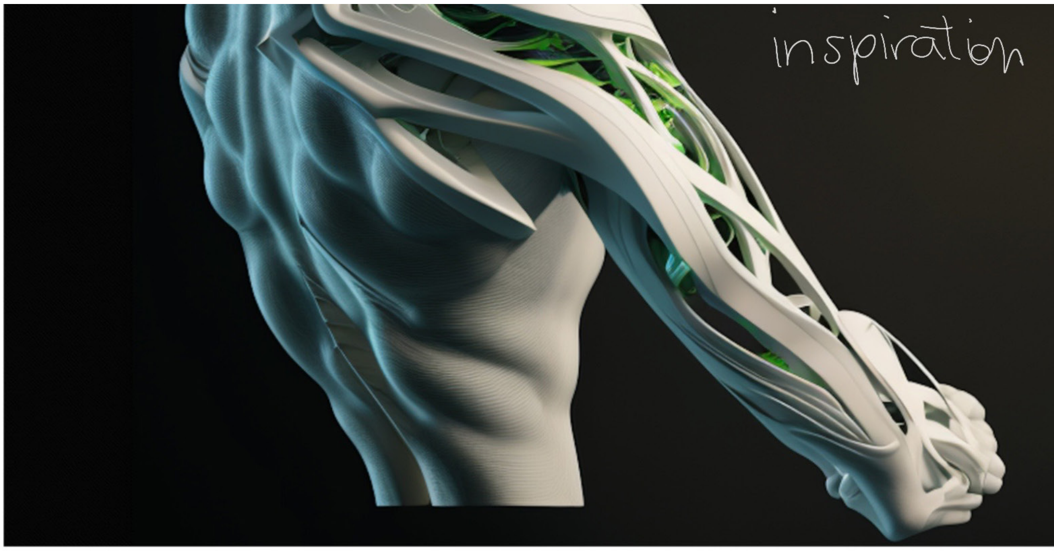


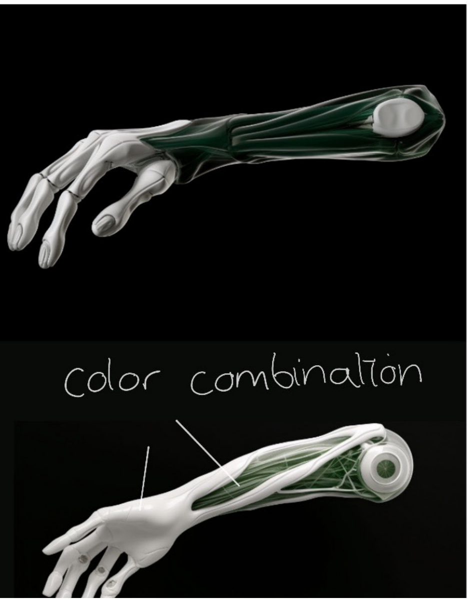


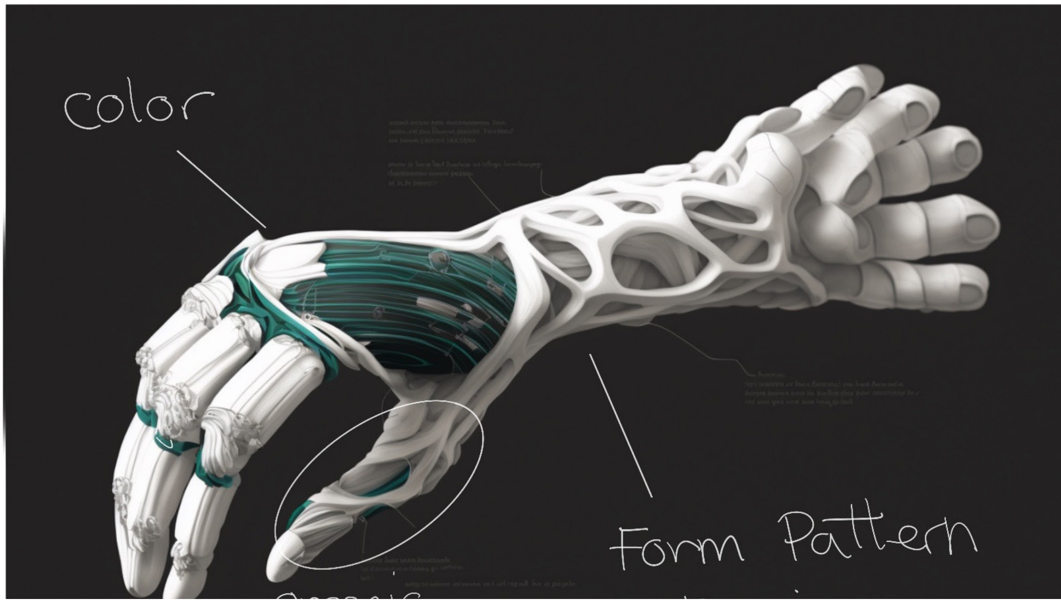


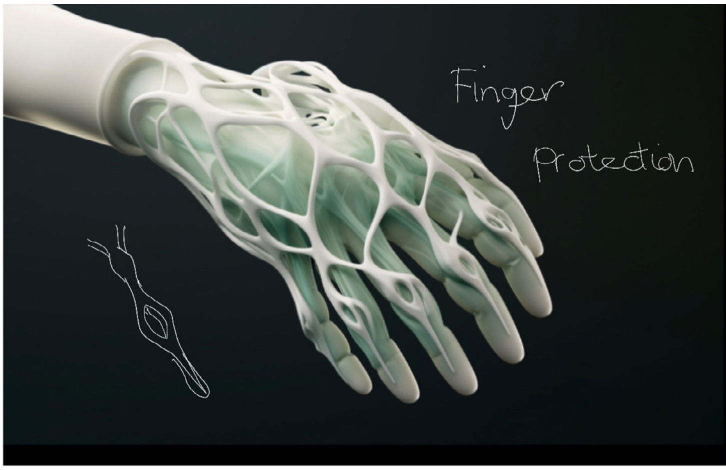
INSPIRATION PICK



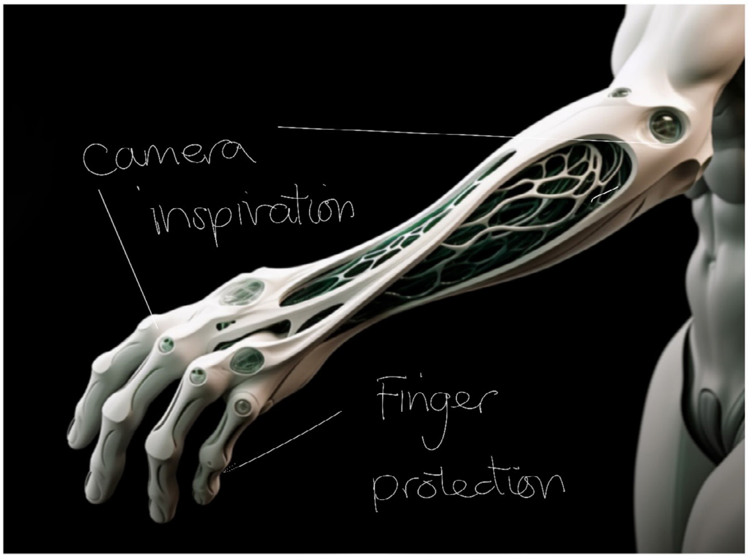


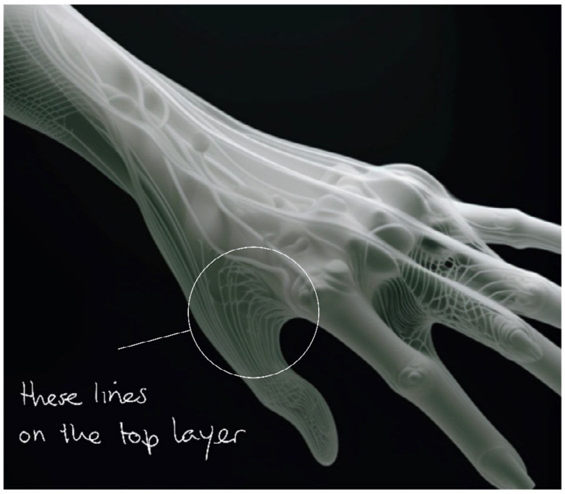


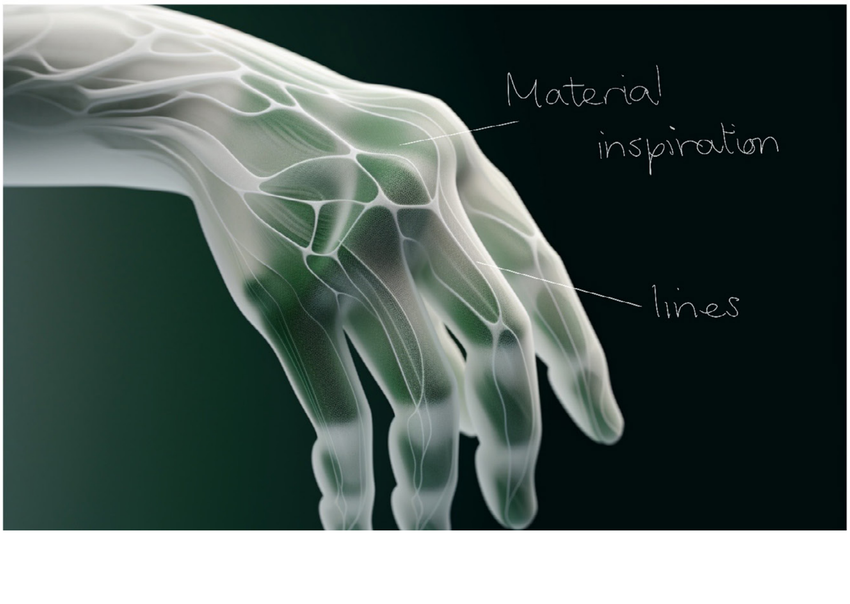
Upon reviewing the generated images, I utilized them as a source of inspiration, created a moodboard and Integrated these ideas into my initial design sketch. The combination of the moodboard and my original sketch provided a solid foundation for the development of a unique and compelling design.


Finger
protection

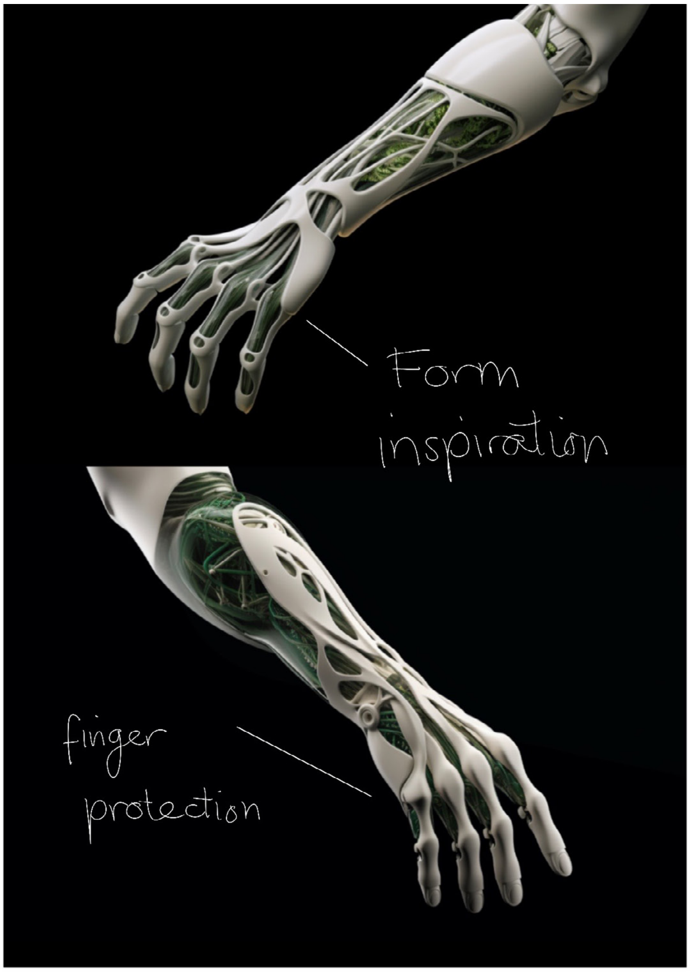

top
layer

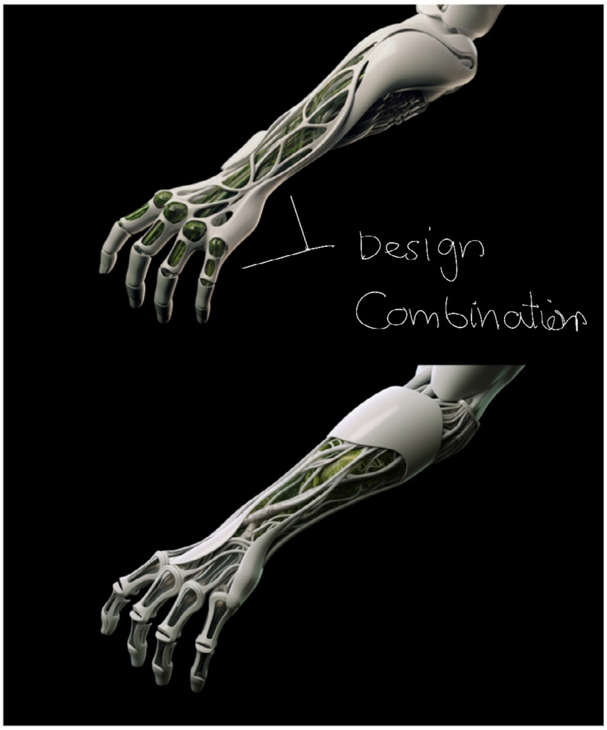

camera
inspiration
Finger
protection


these lines
on the top layer

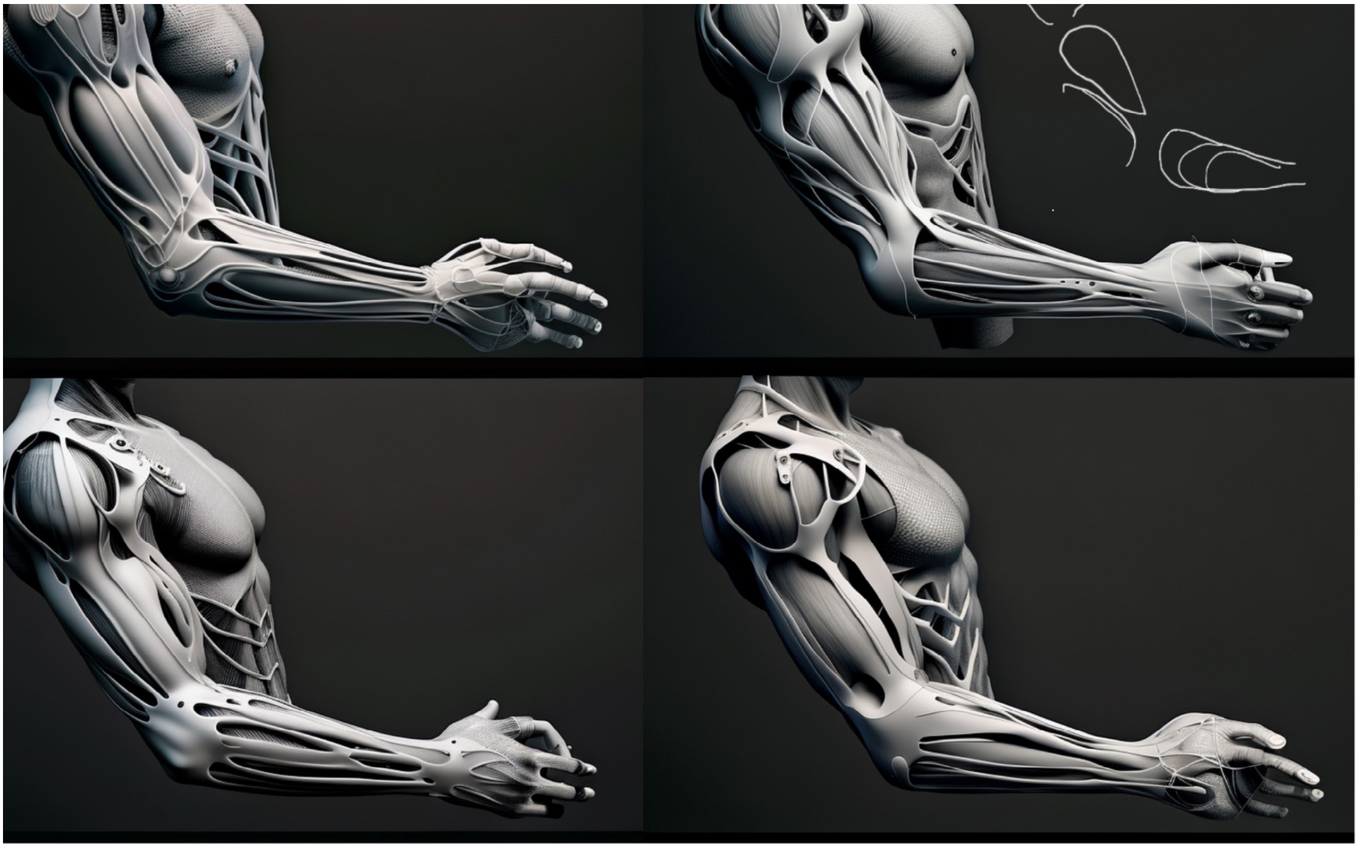

Material
inspiration
lines

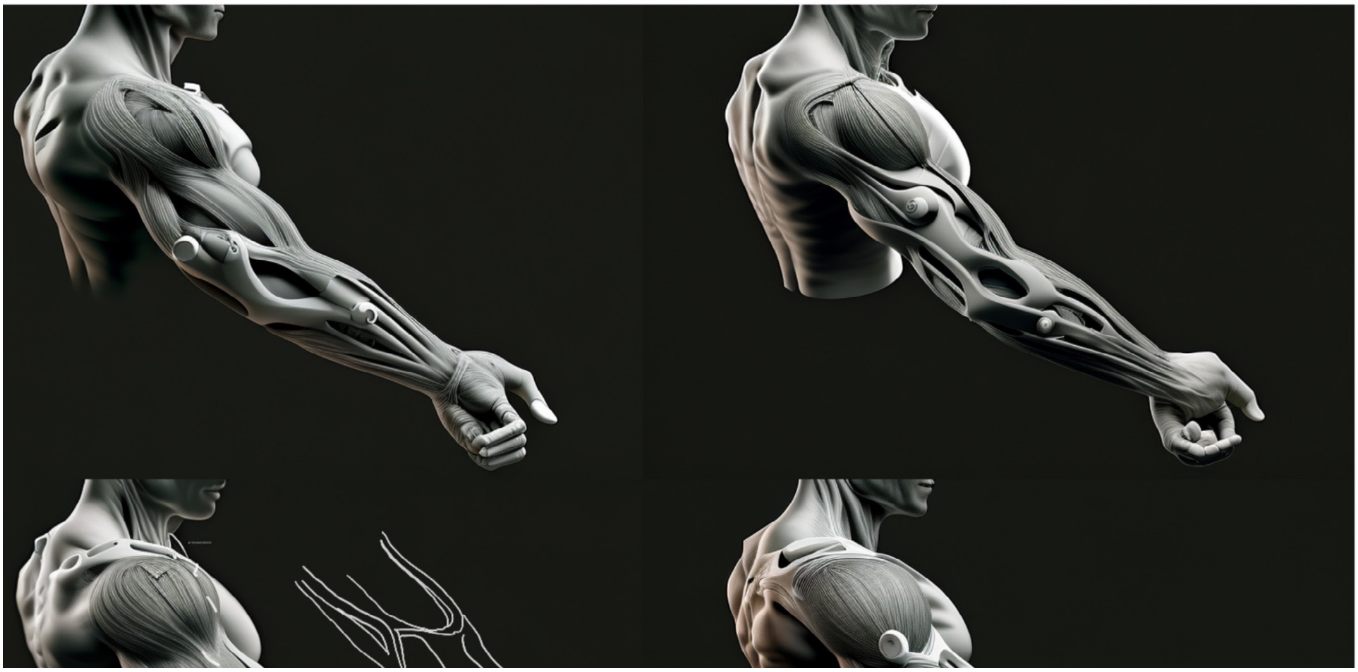

these patterns
on the fingers

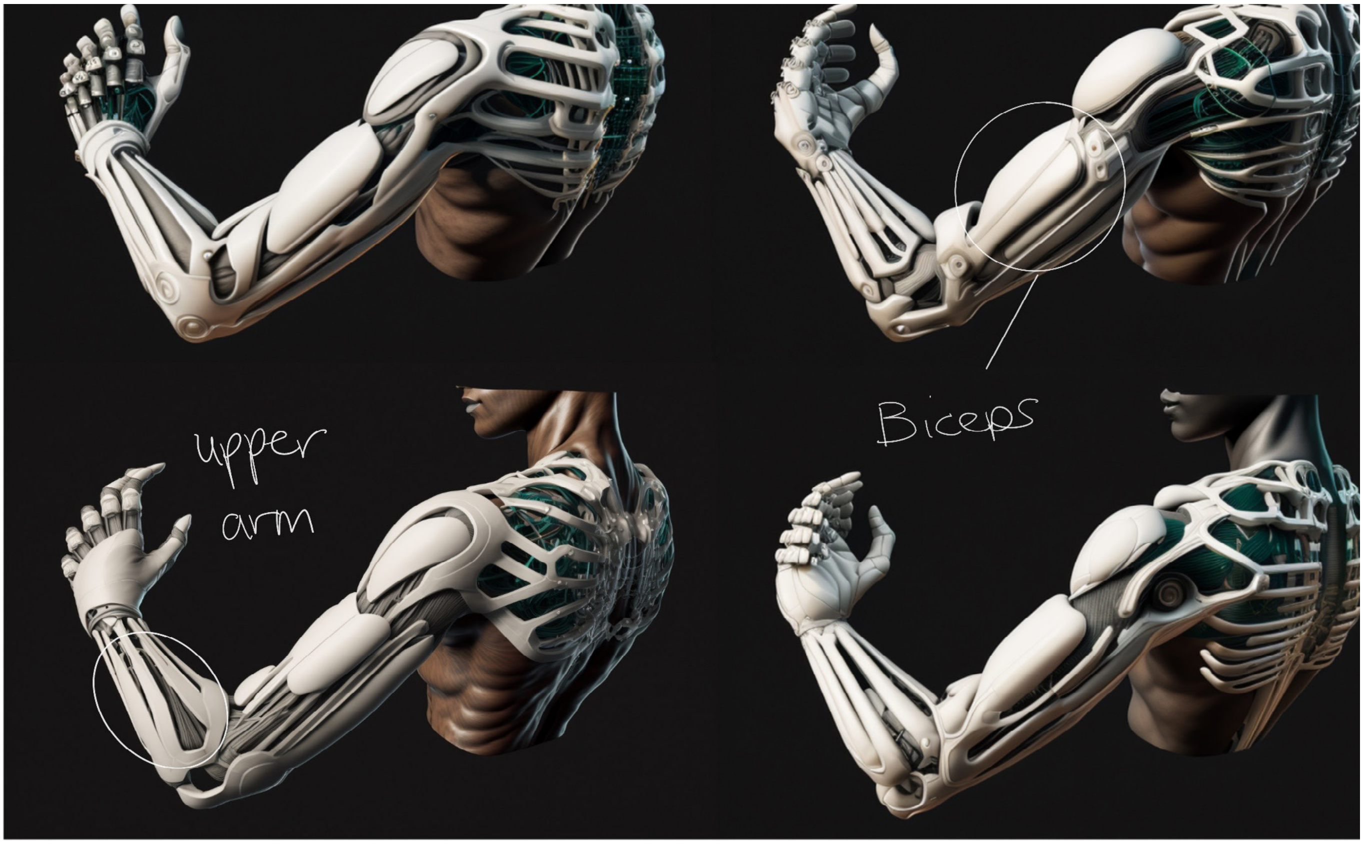

Form
inspiration
finger
protection

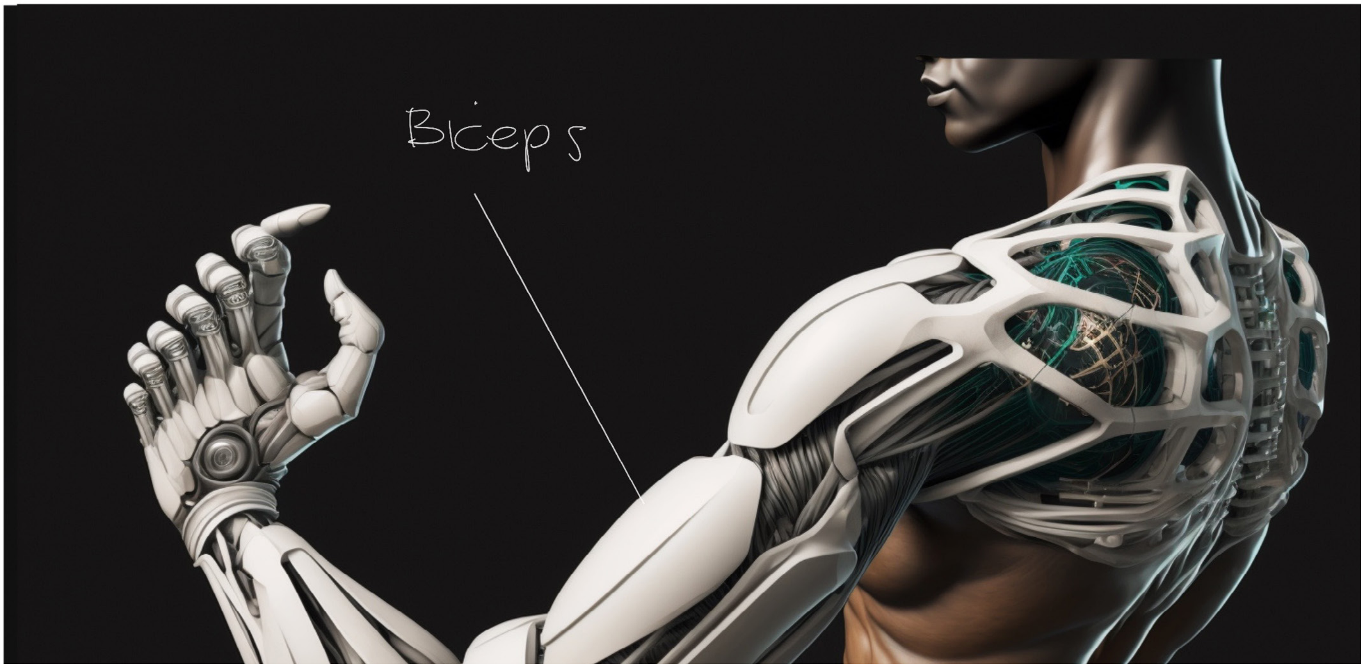

Design
Combination


Design
form

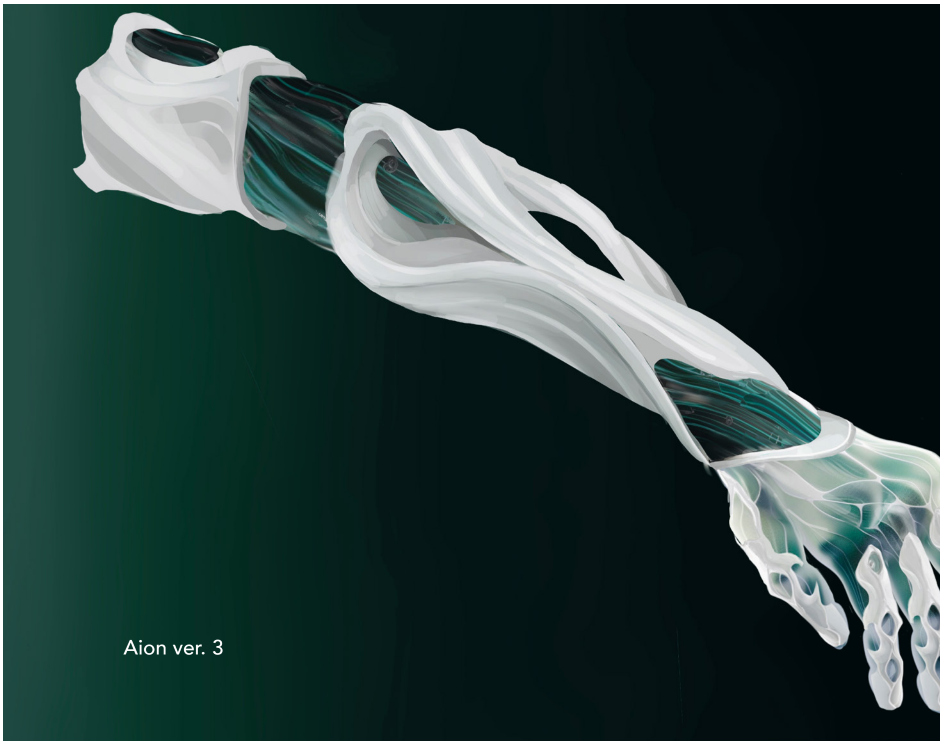


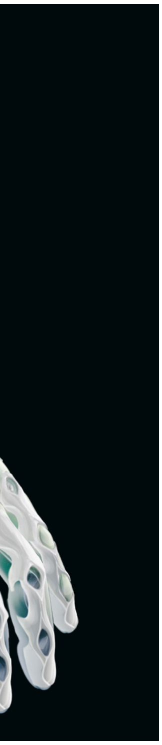



upper arm
Biceps


Biceps

HAND RENDERINGS

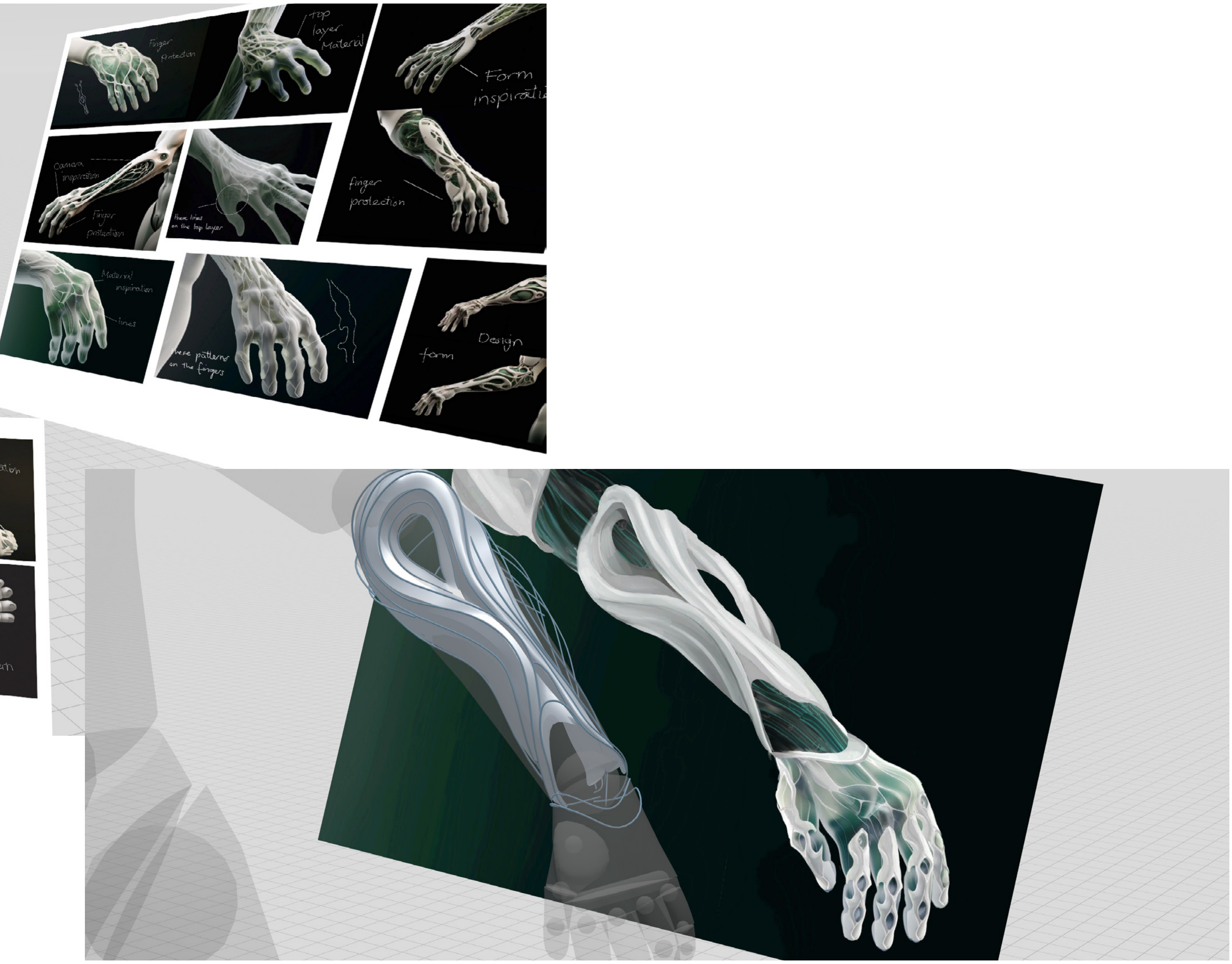




Aion ver. 4

HUE VARIATION

GRAVITY SKETCH



To further explore the dimensions of my design, I turned to Gravity Sketch, a virtual reality modeling program. Immersed in the virtual environment, I aimed to obtain a three-dimensional representation of my concept. However, upon experiencing the design in this medium, I quickly realized that it appeared excessively bulky and failed to meet my aesthetic preferences.

I decided to create a fresh sketch. With the new concept in hand, I transitioned to Blender, a powerful 3D modeling software.

3D MODELING

This chapter dives into the complexity of character and prosthetic creation, focusing on the challenges of modeling, rigging, and animating.

3D MODELING

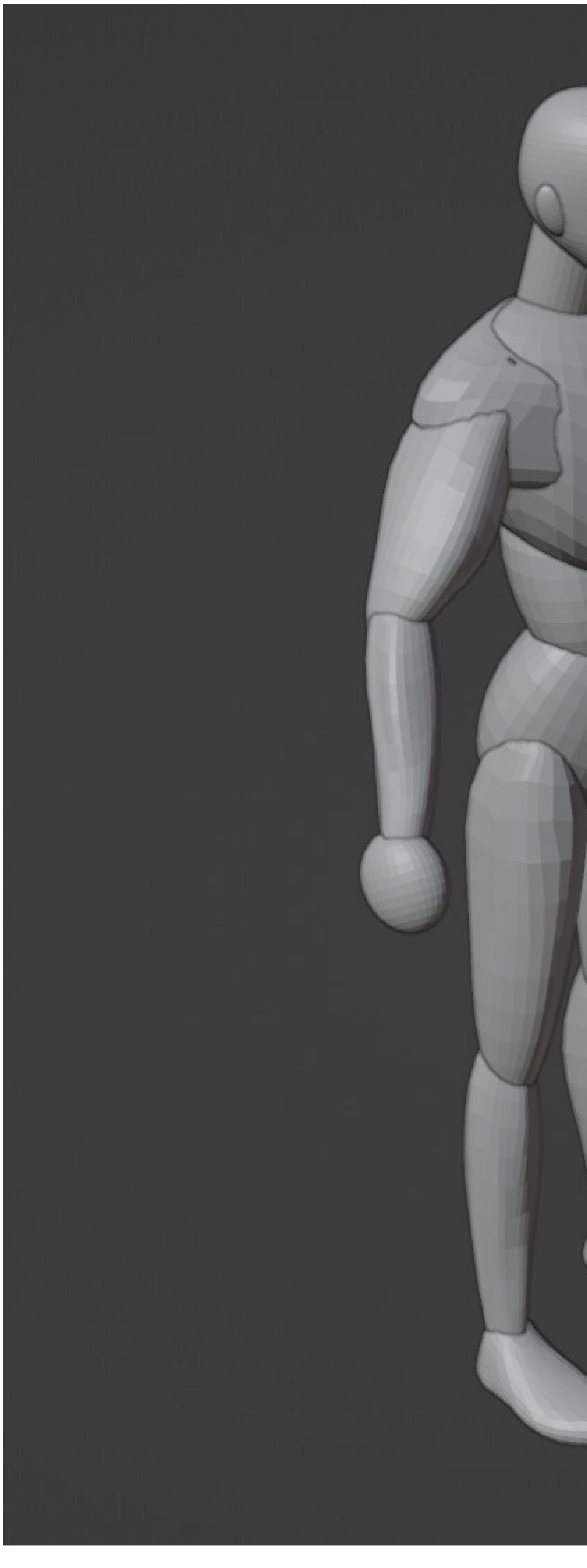
Mastering the techniques and software required to create a character adds an additional layer of complexity to the process. It entails learning and becoming proficient in specialized 3D modeling software, such as Blender, which offers a wide range of tools and features for character creation.

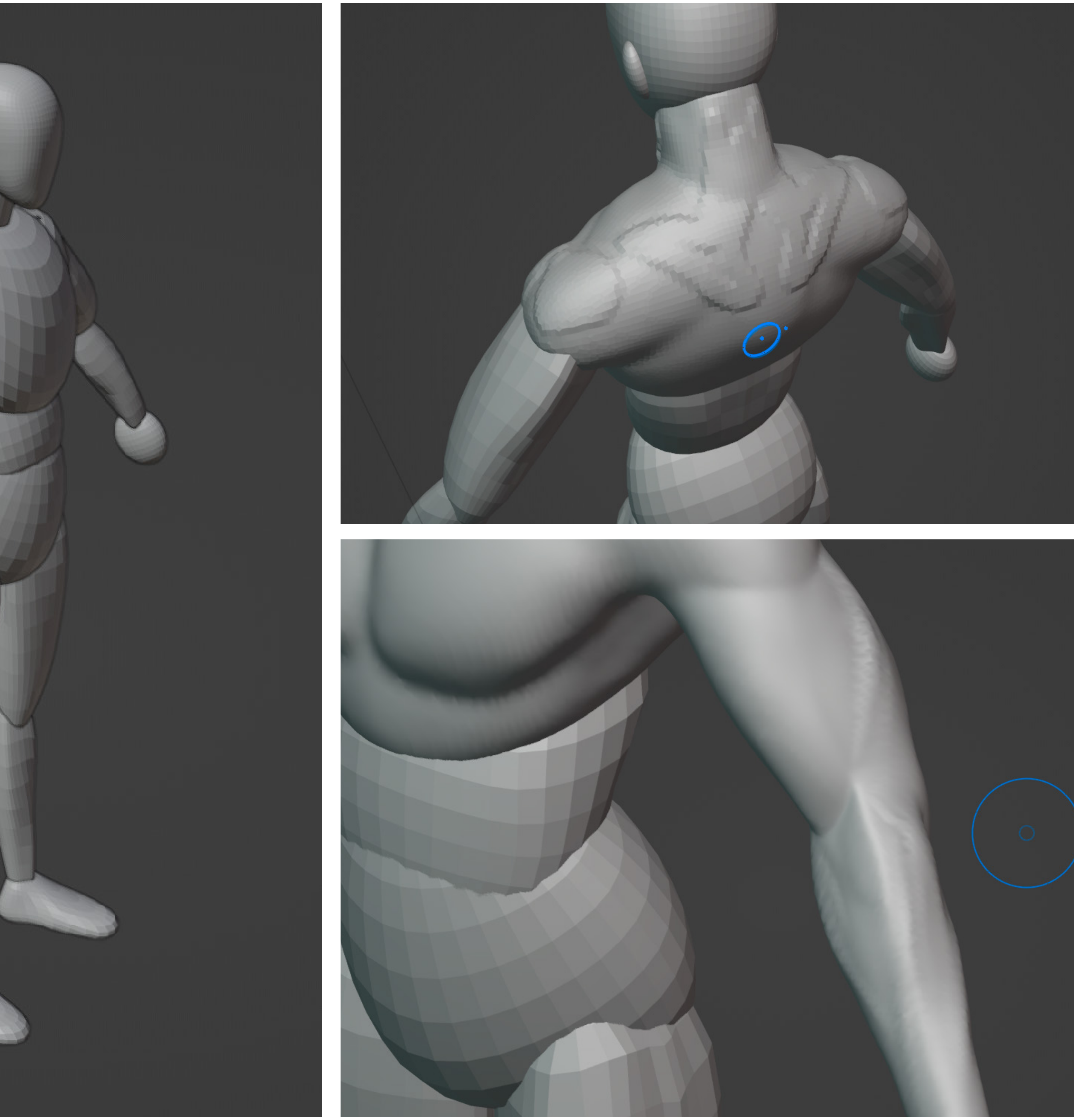
Creating a the character, the prosthetic and the environment in blender involves acquiring knowledge of sculpting, topology, rigging, material nodes and texturing techniques. These additional skills had to be aquired to continue on the process.

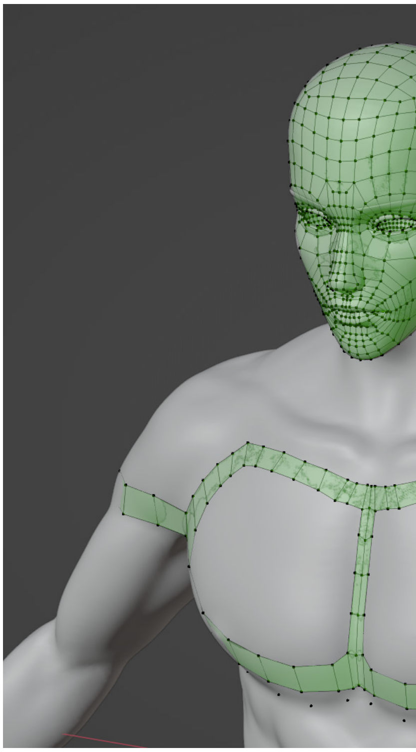
The complexity of character creation extends beyond the initial modeling phase. Animation, in particular, introduces a whole new level of technical challenges. Rigging, the process of creating a skeleton or control system for the character, is essential to enable movement and articulation. Each component of the character, including the prosthetic and its various parts, must be properly rigged to ensure seamless motion.

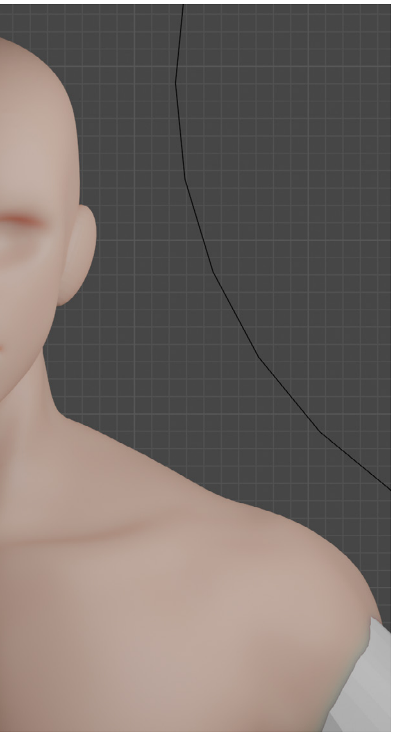
Preparing the character and the prosthetic for animation involves weight painting, which assigns influence to different parts of the character's mesh to control how they deform during movement. This meticulous process ensures that the character's movements appear natural and fluid. It requires fine-tuning and iterating, as it often involves trial and error to achieve the desired results.

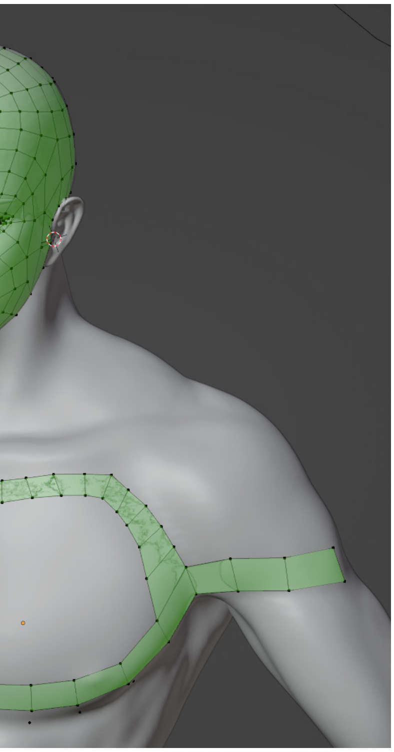
It is important to note that these processes do not always work flawlessly on the first attempt. Technical issues and unexpected challenges may arise, adding an additional layer of stress and complexity to the work. Problem-solving and troubleshooting become integral parts of the creative process, requiring patience, perseverance, and a deep understanding of the software and its capabilities.

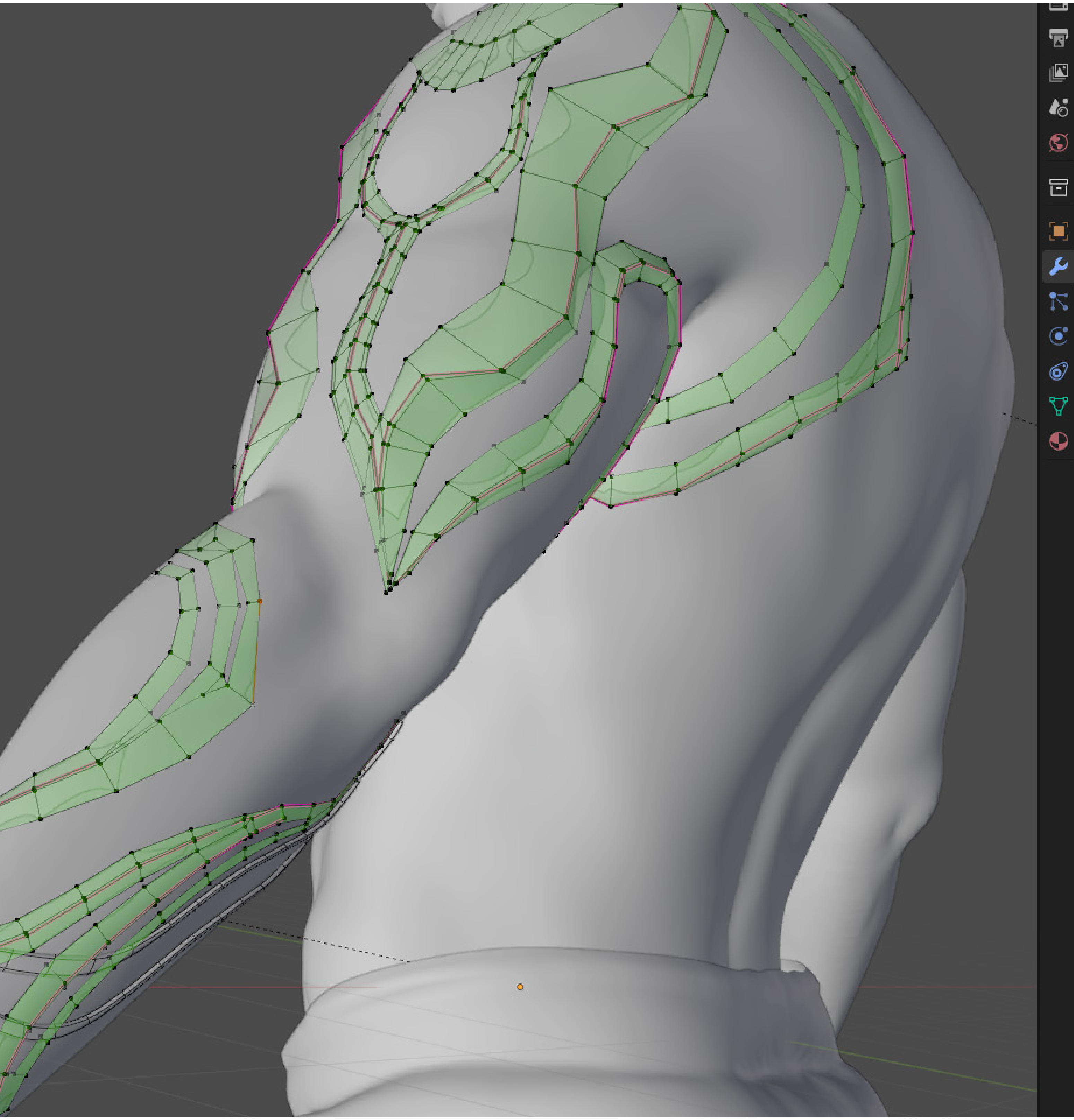


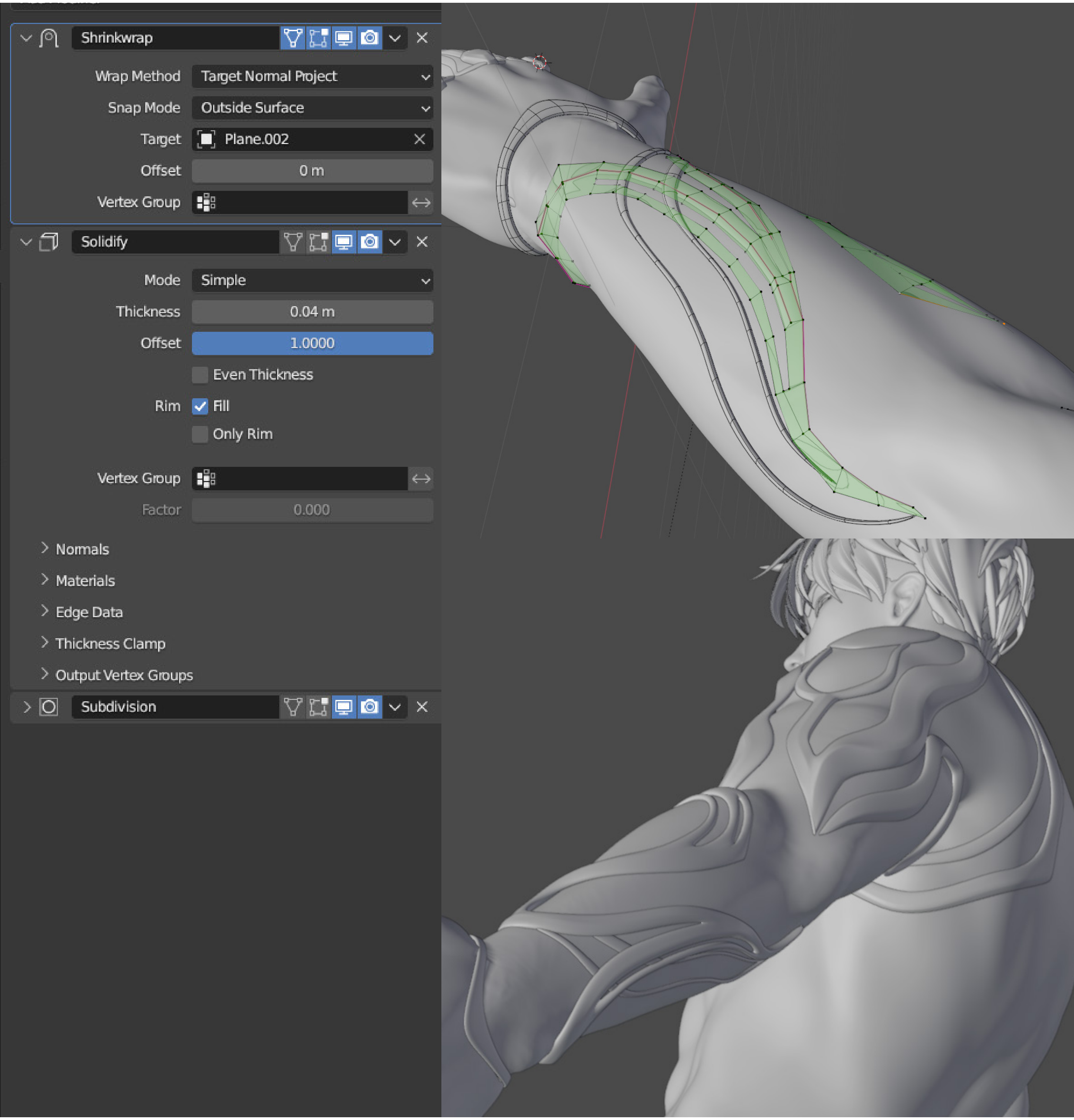








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Mode
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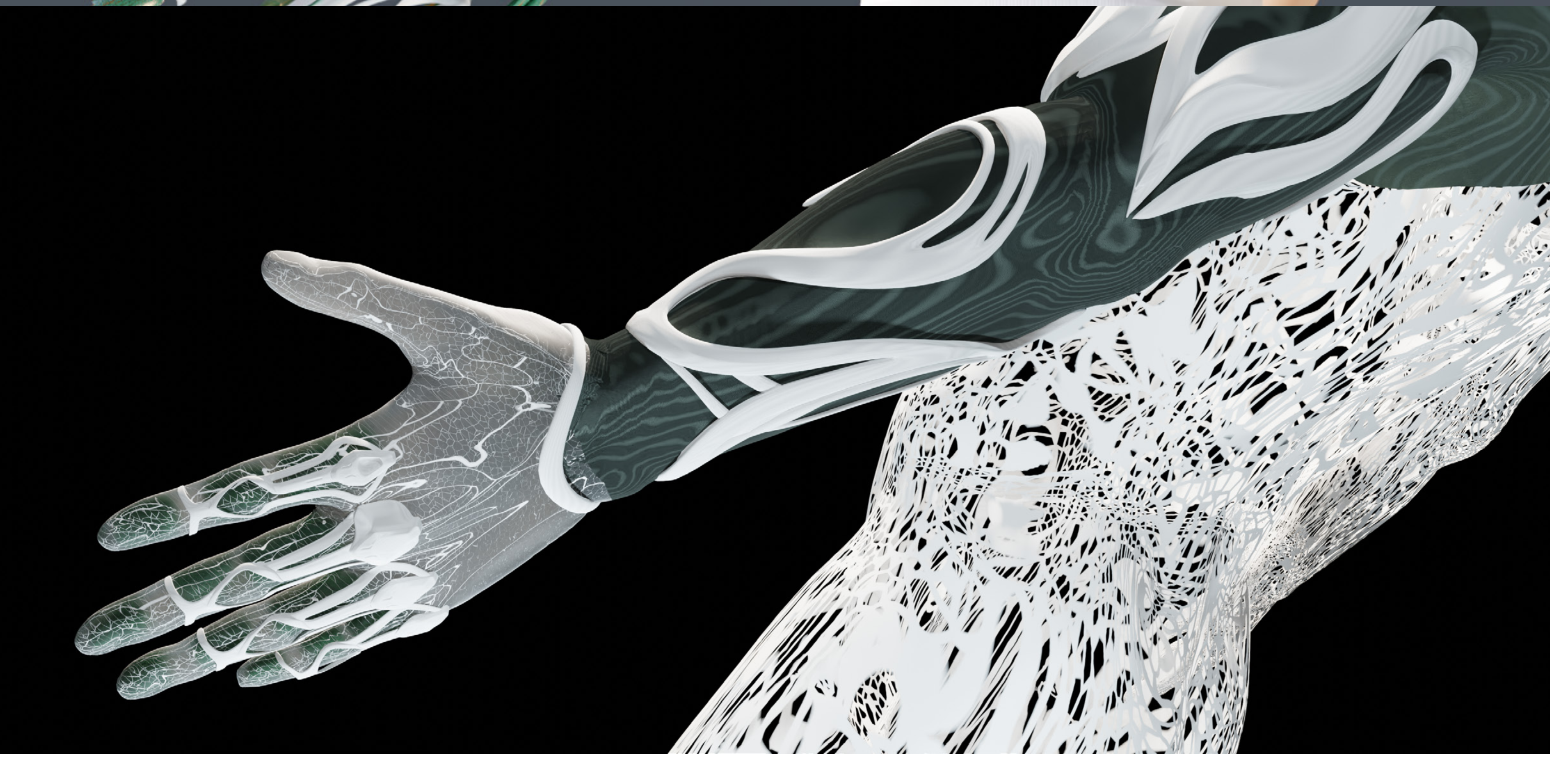
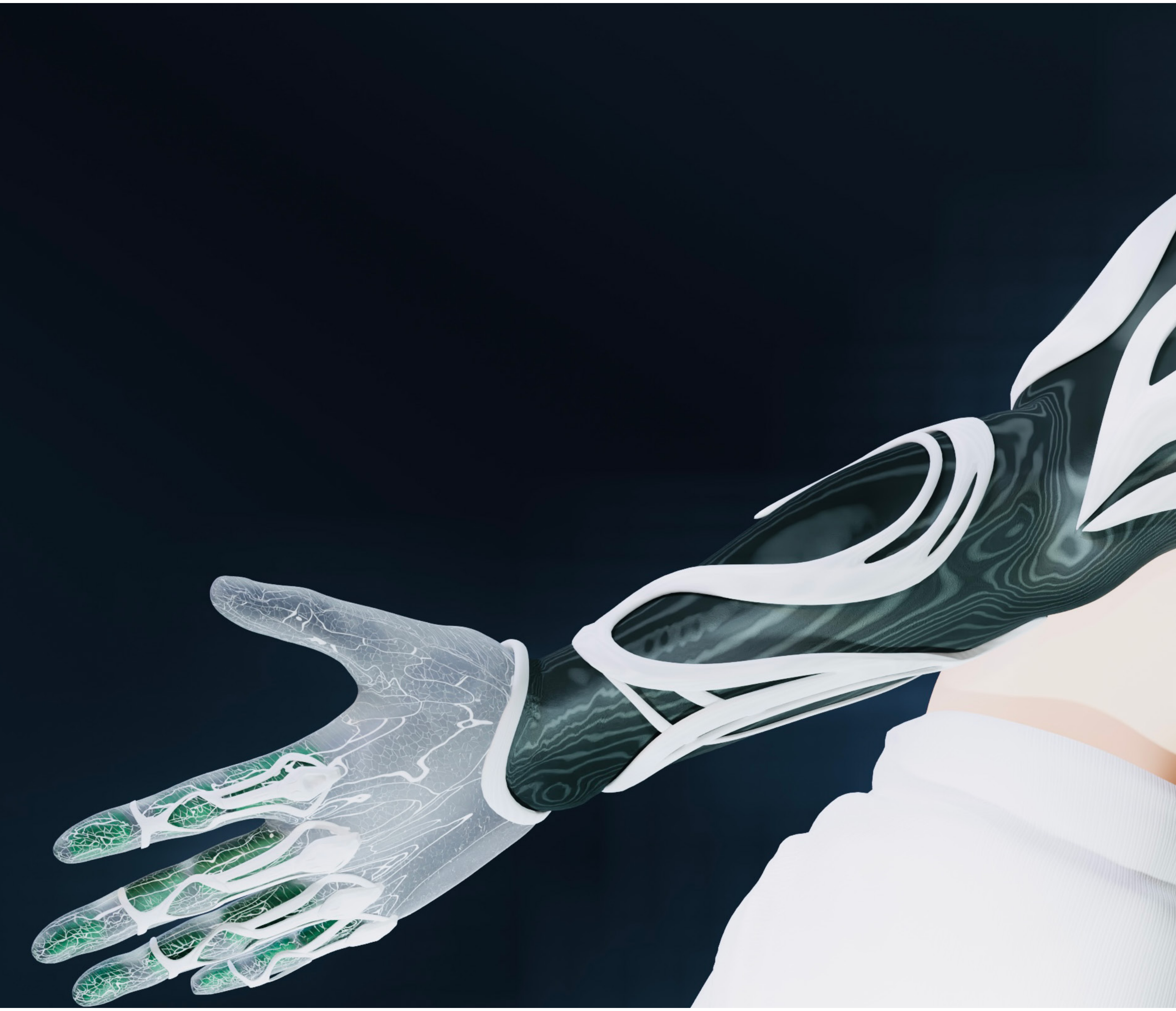
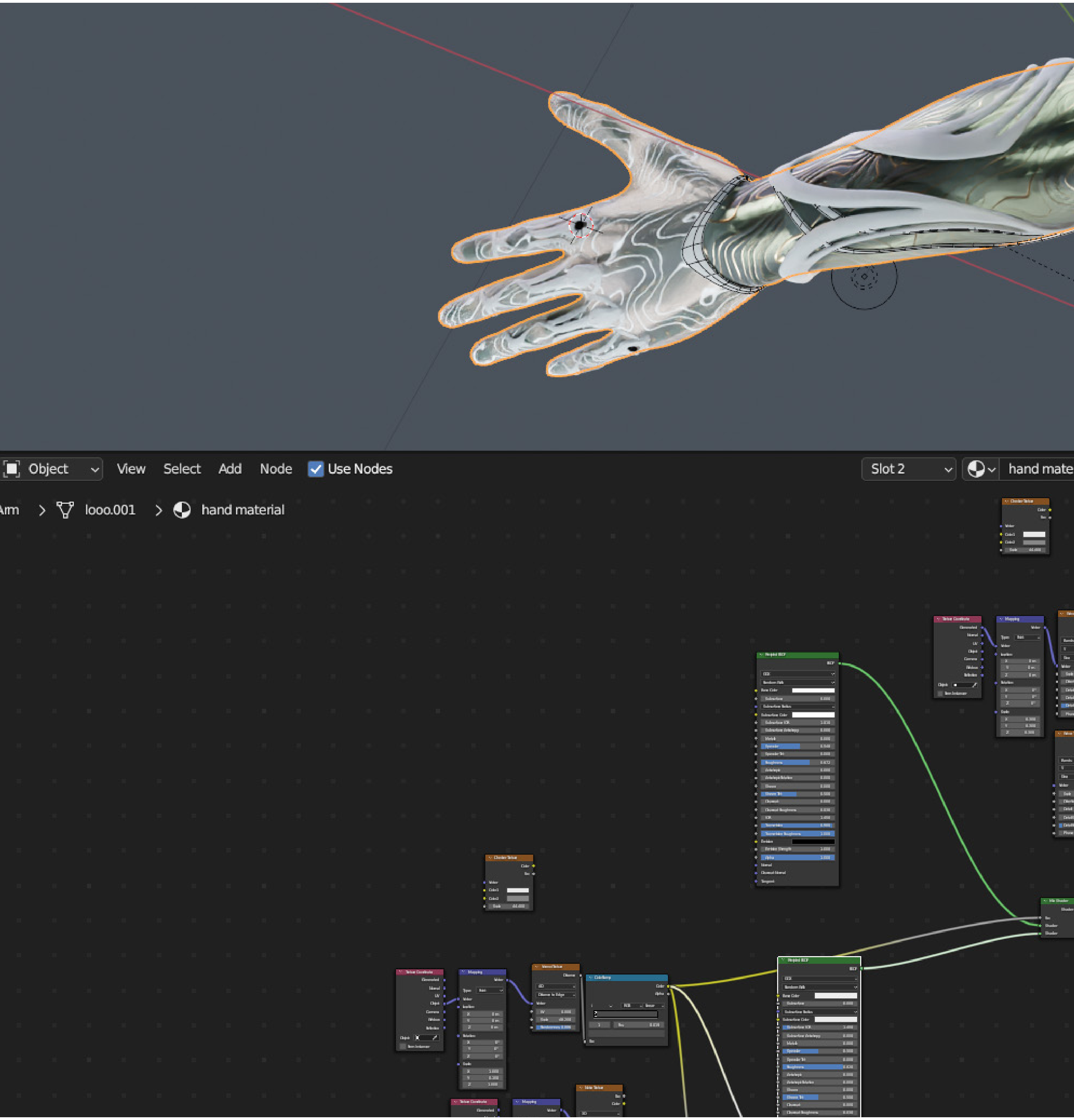
Subdivision

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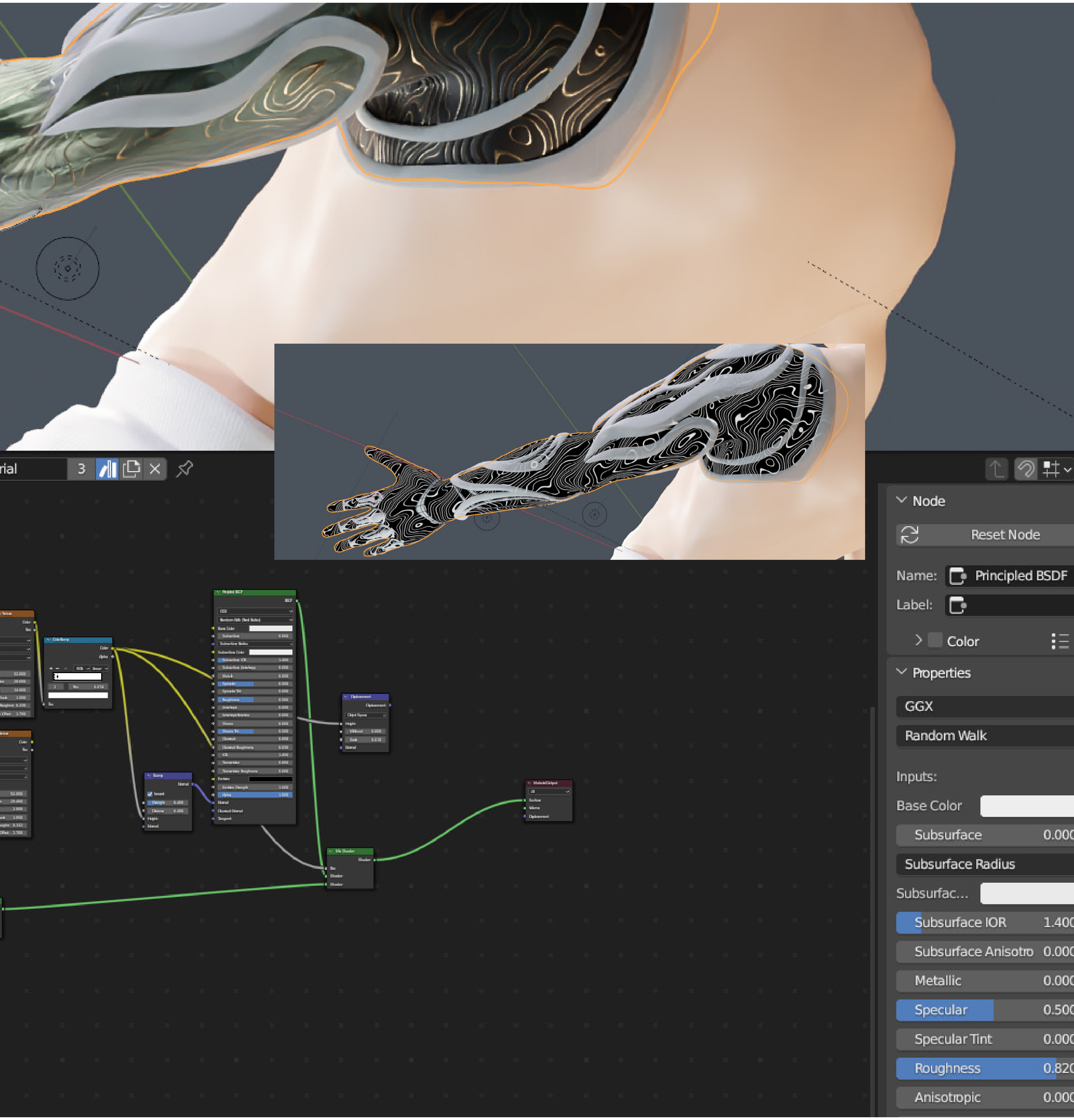
hand material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GGX
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Subsurface Radius
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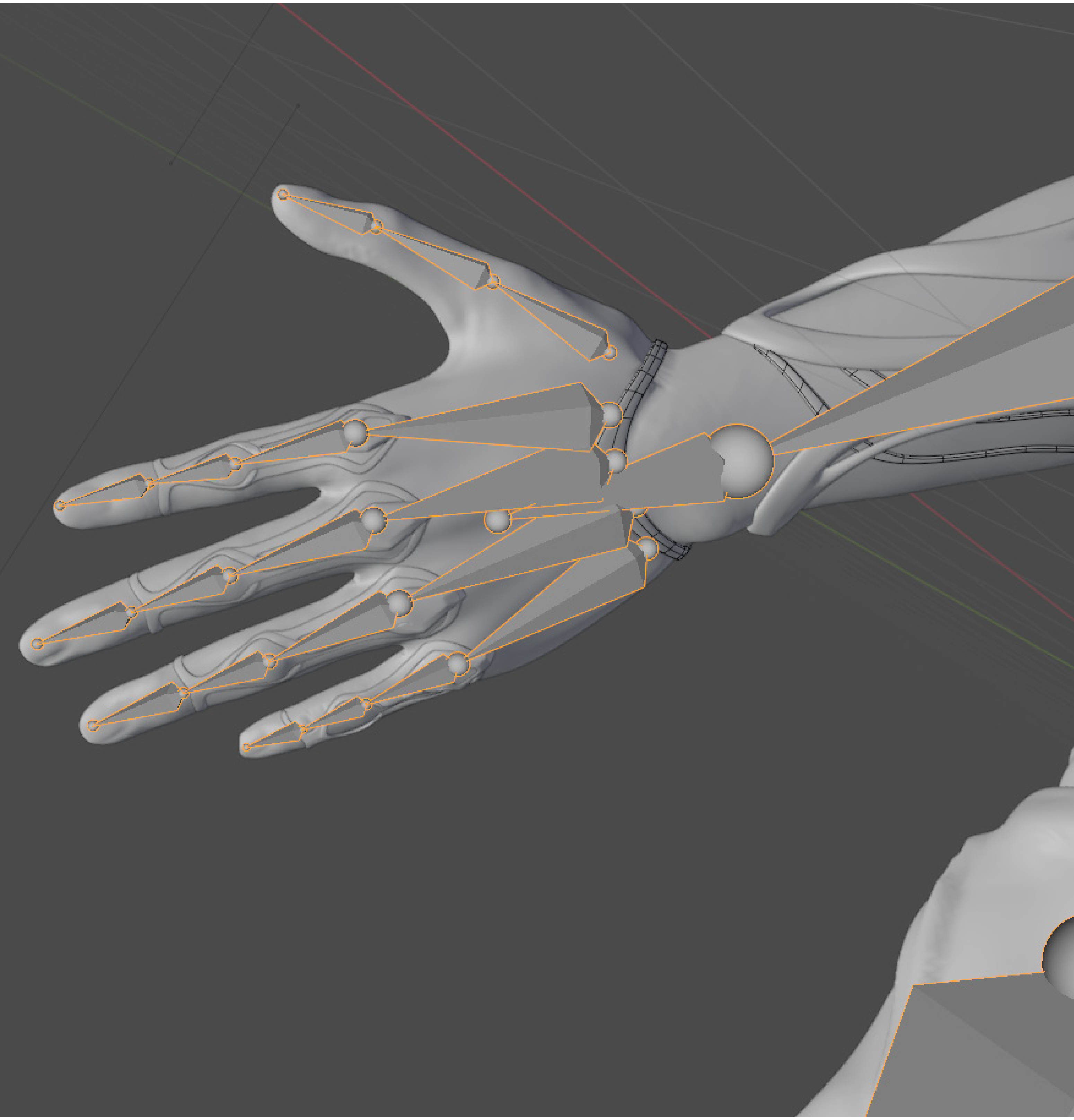
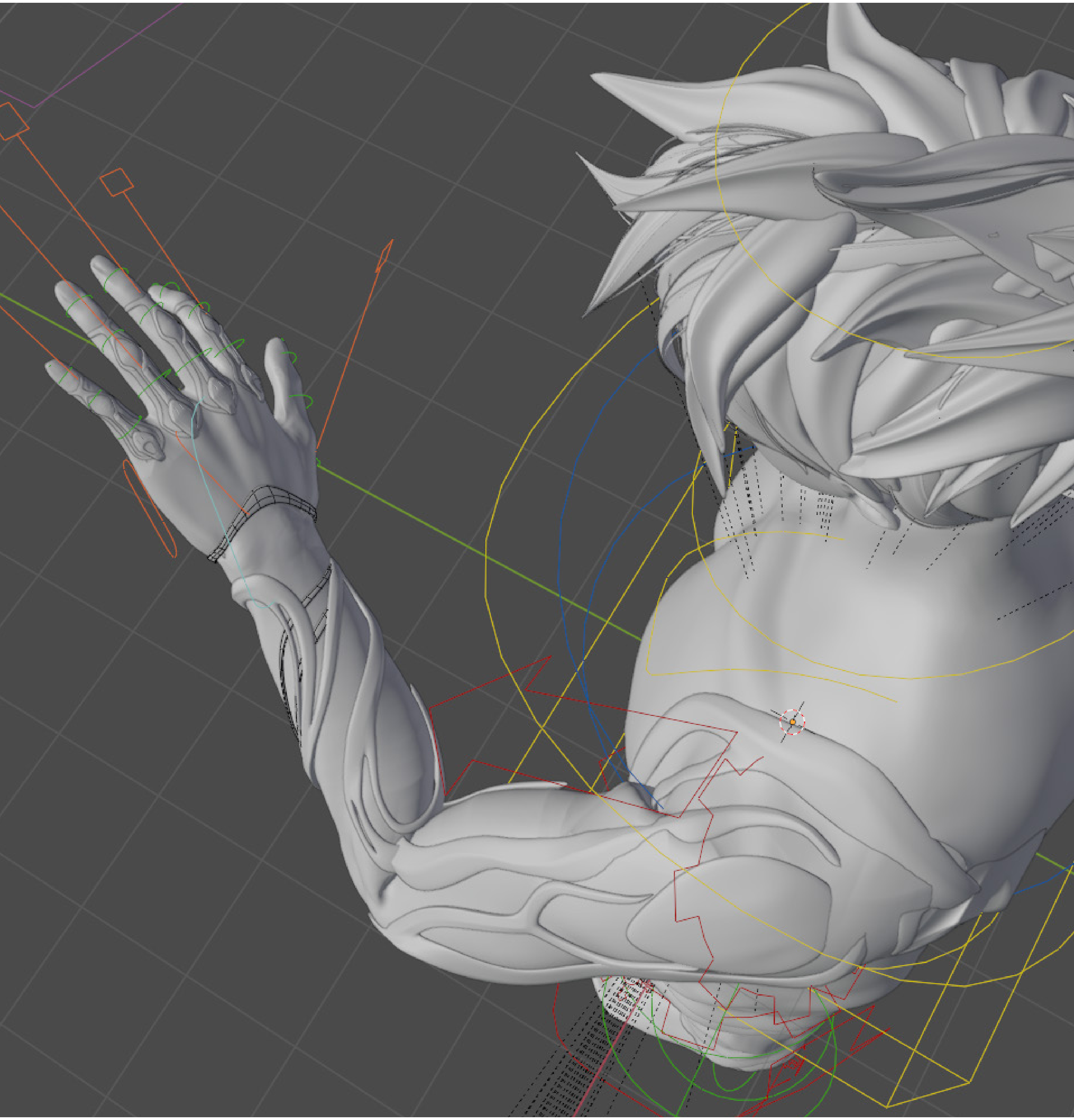
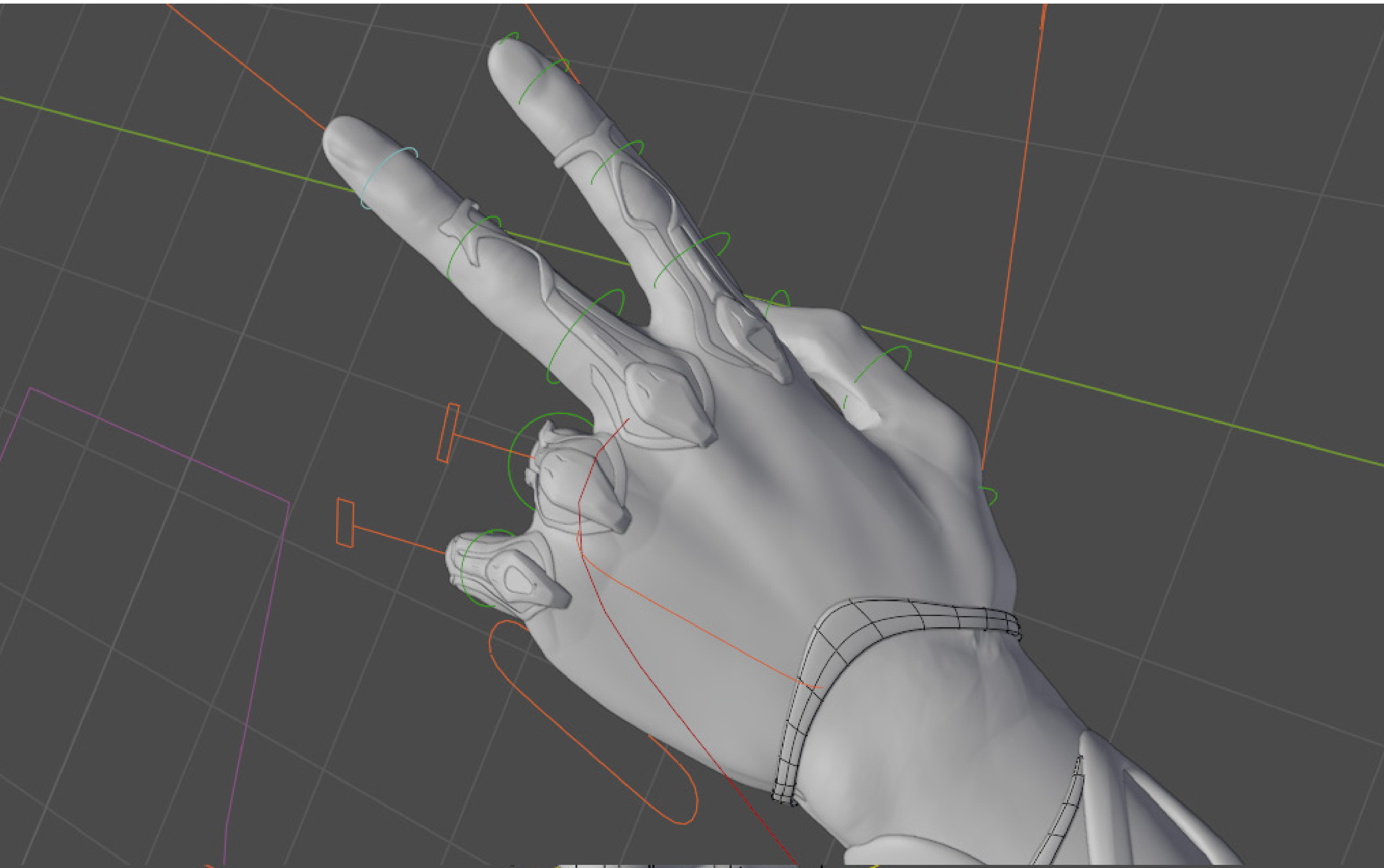
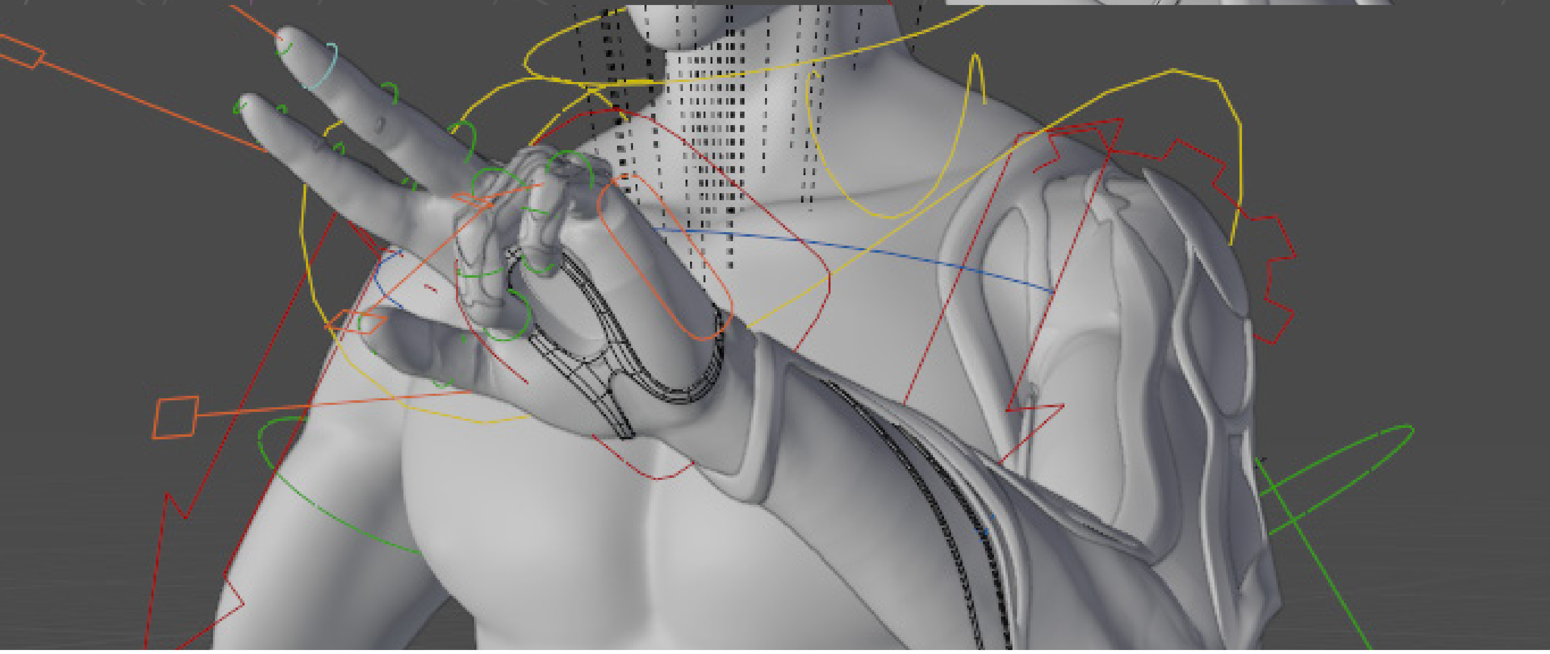
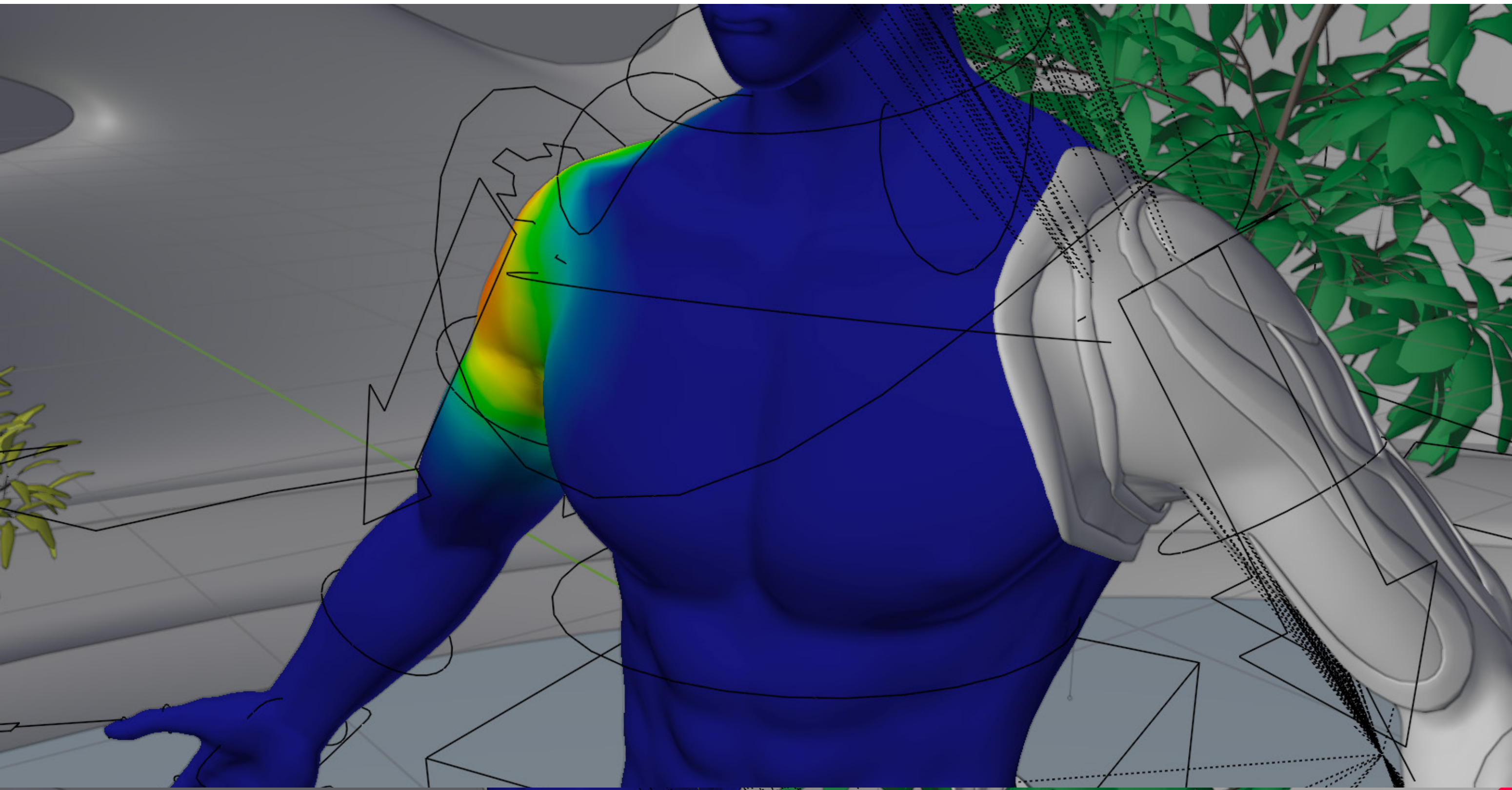
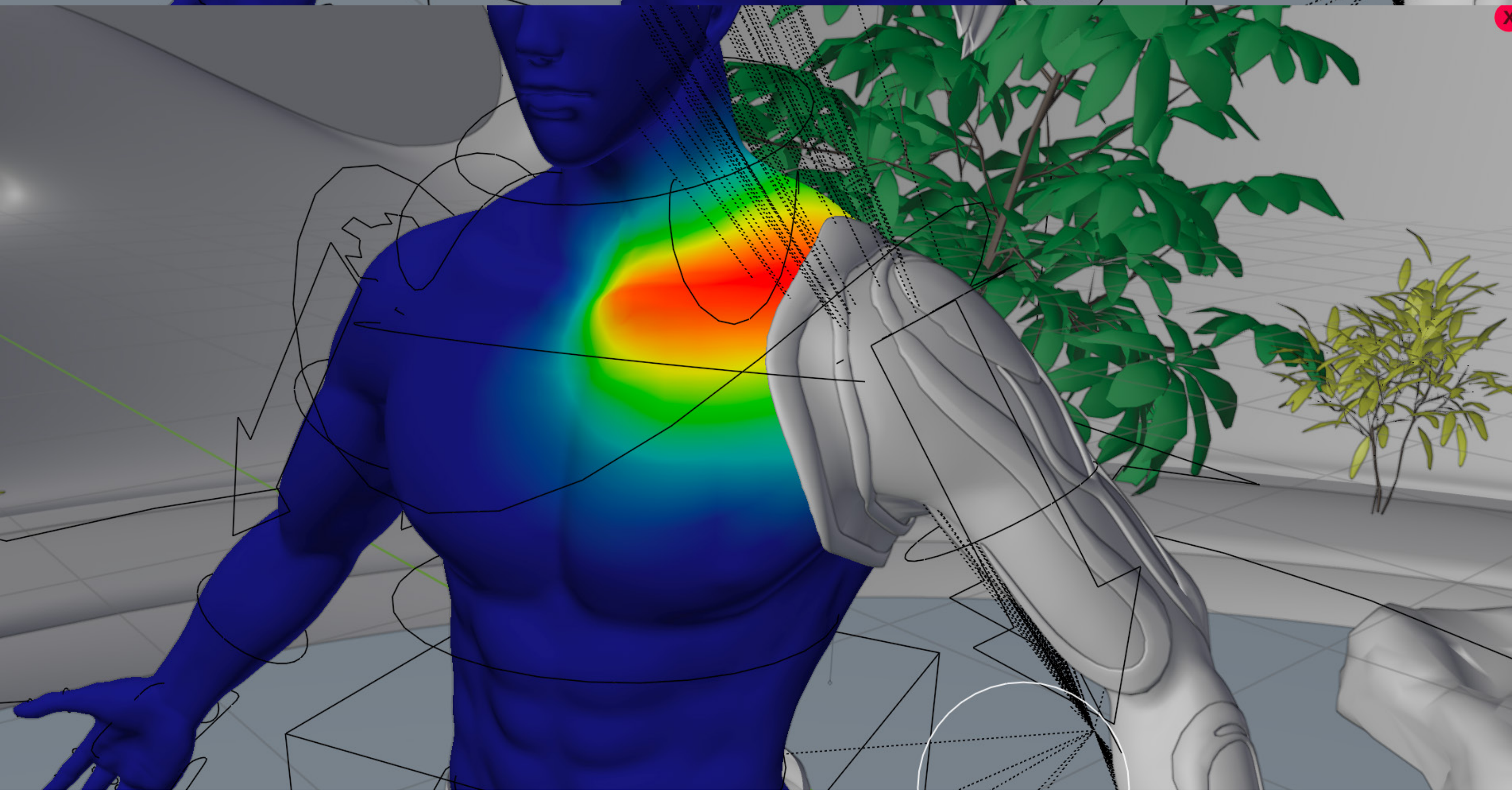


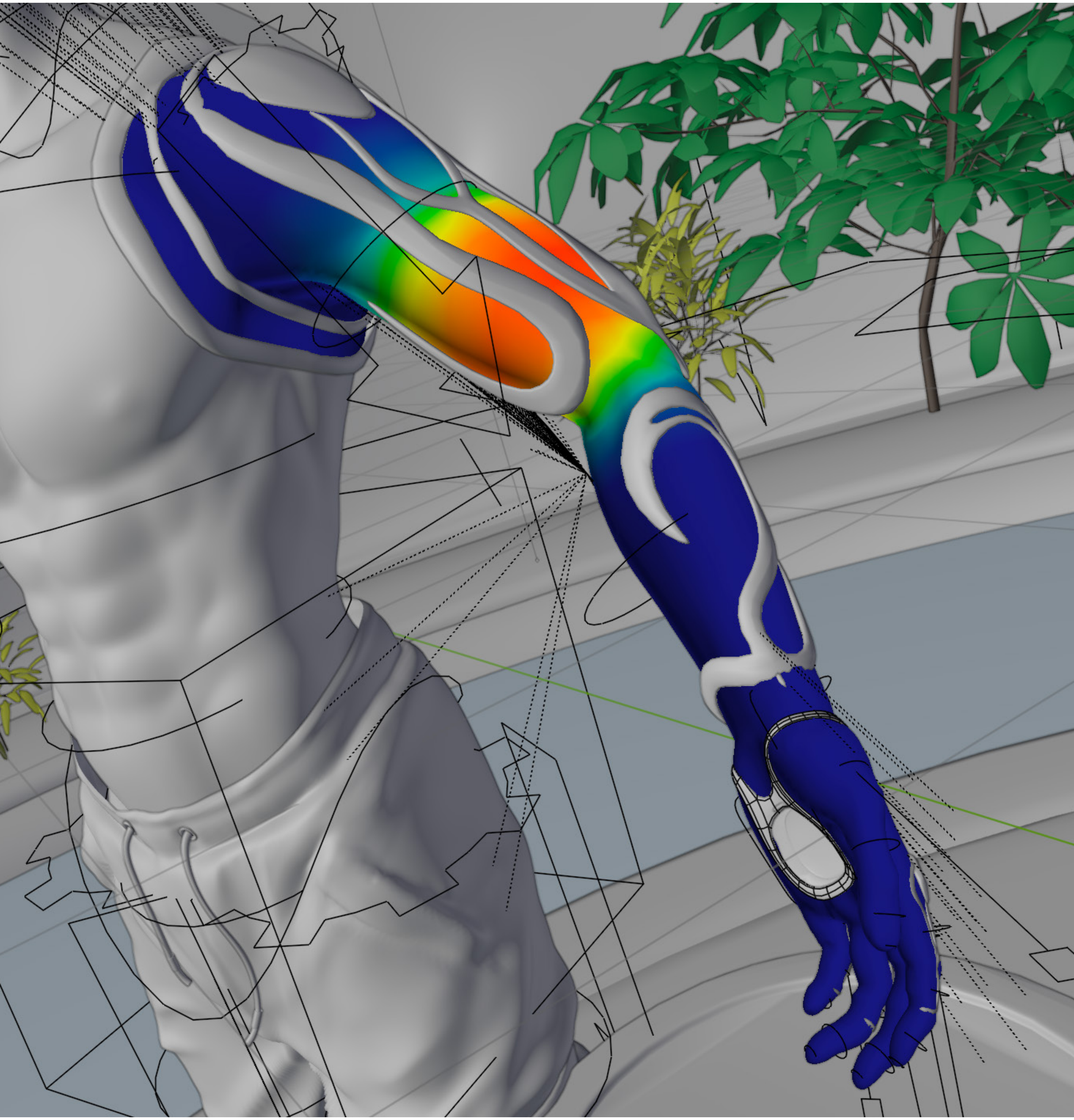


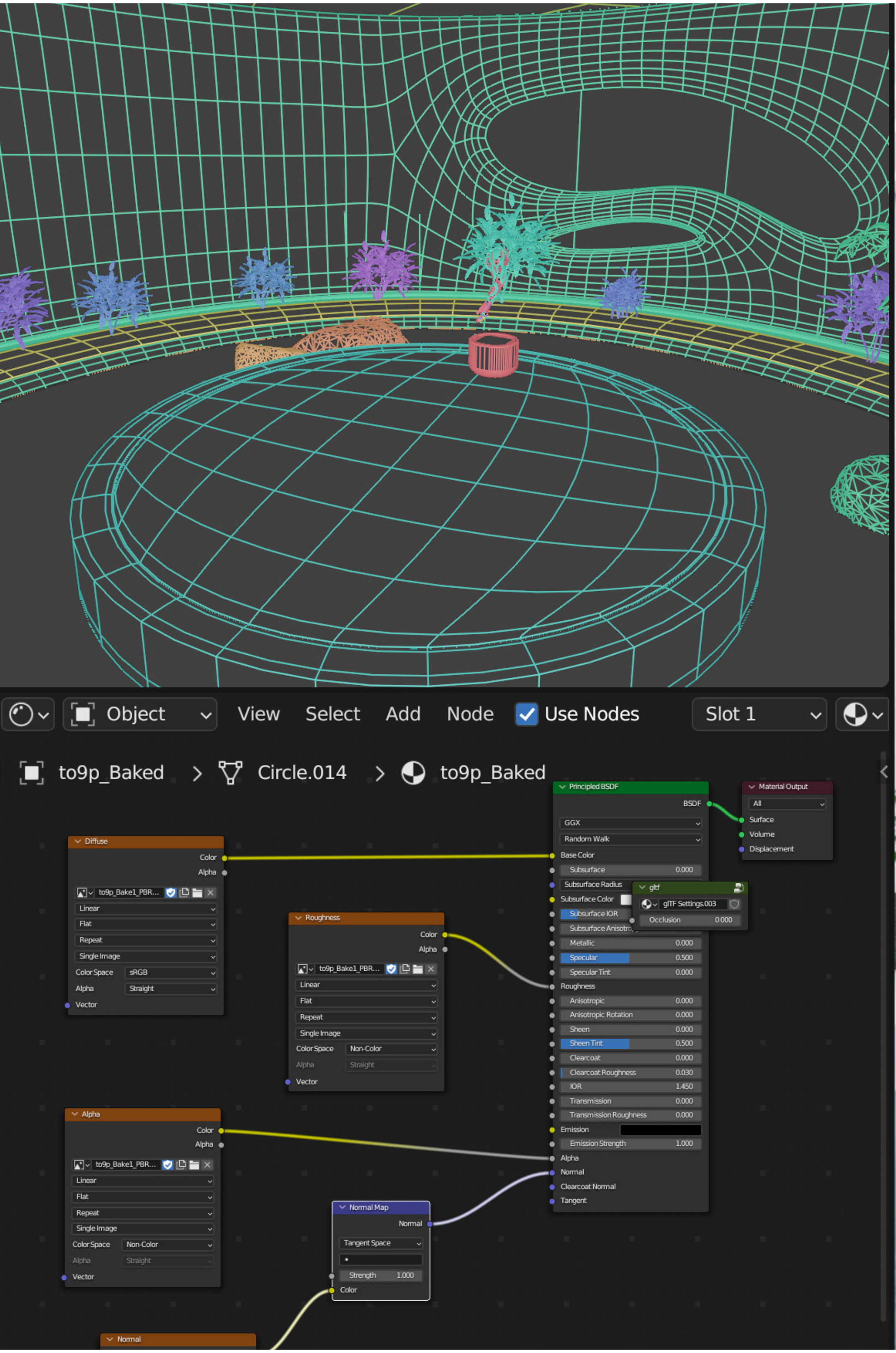


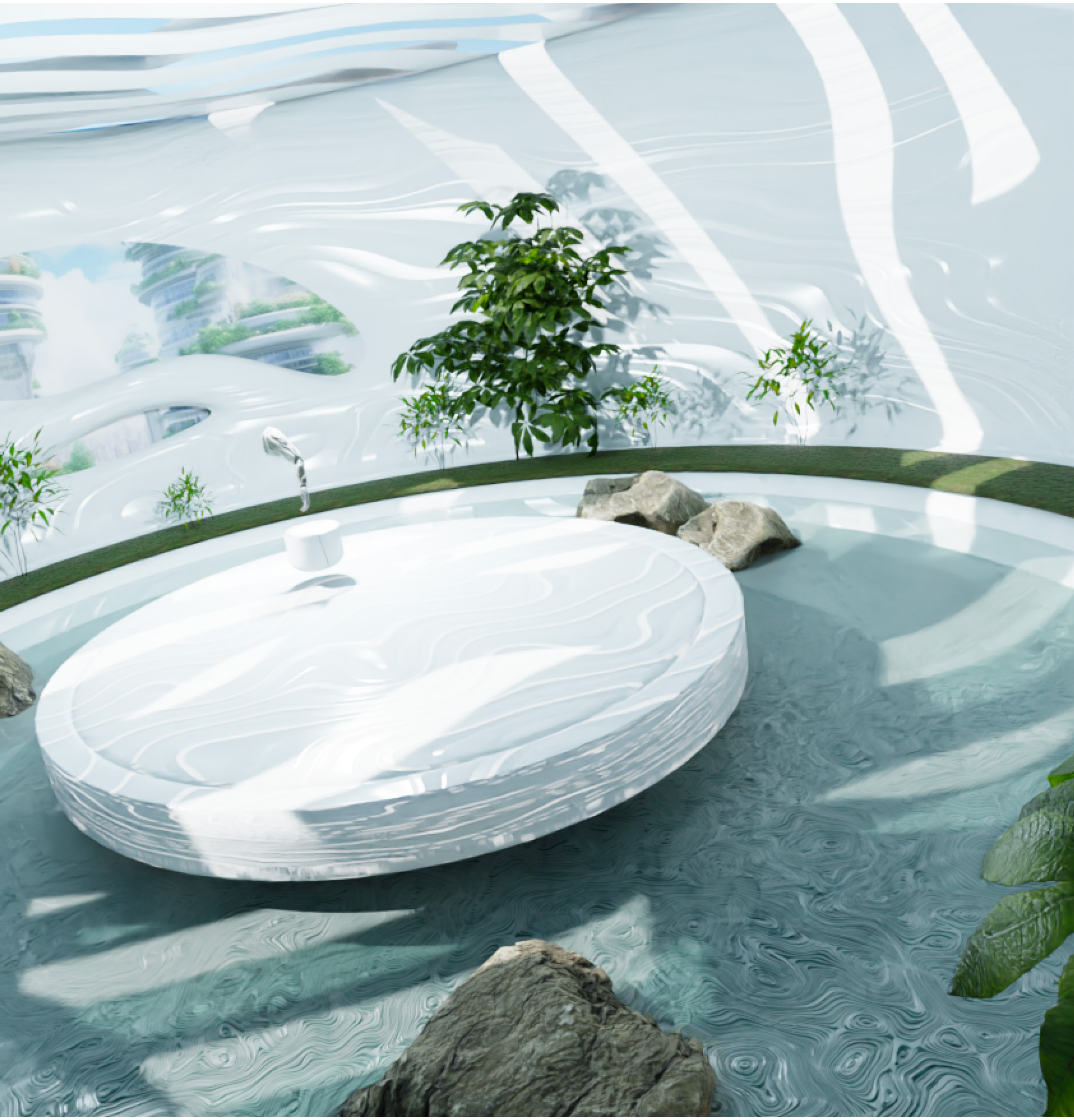


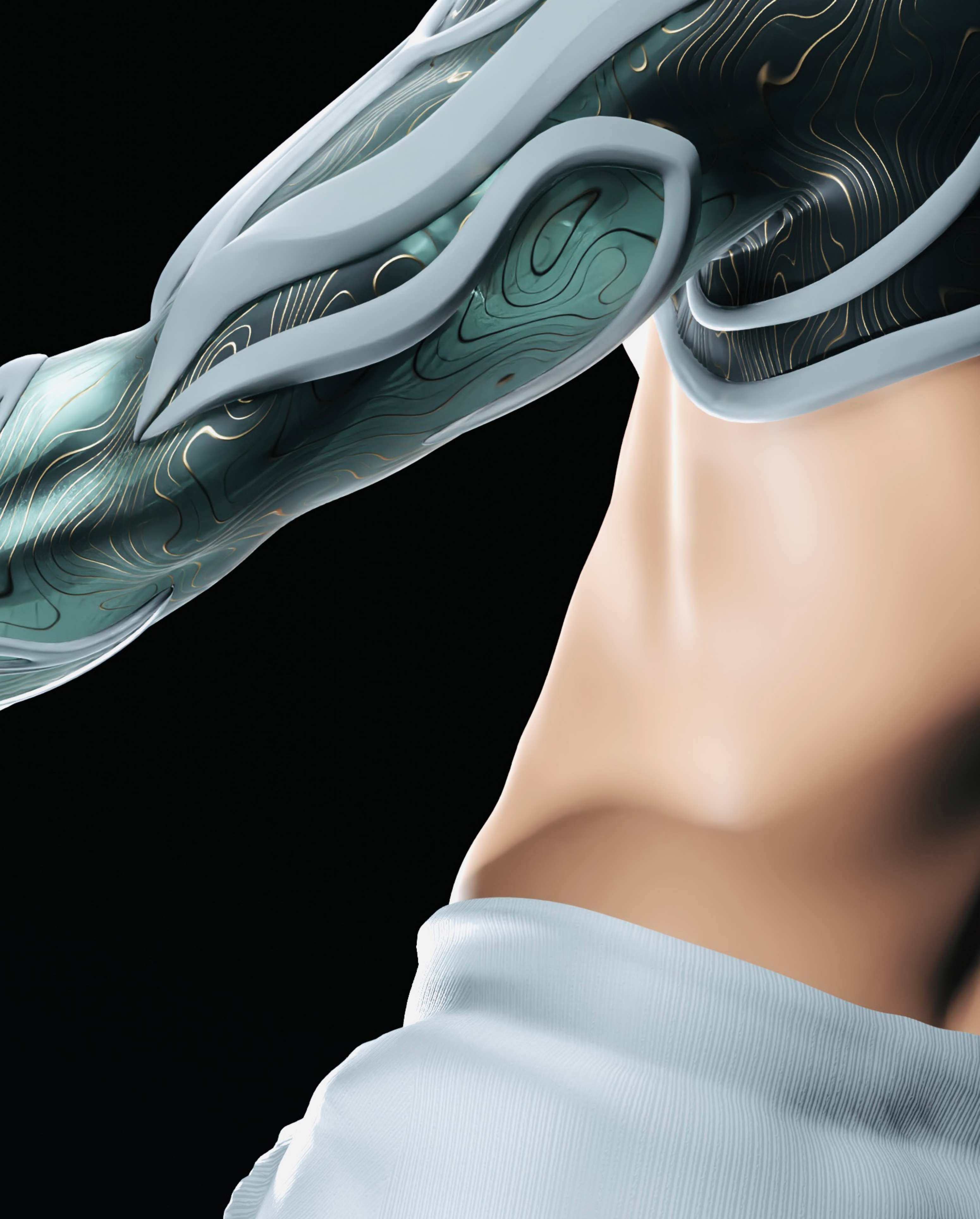







Object
View
Select
Add
Node
Use Nodes
Slot 1
to9p_Baked
Circle.014
to9p_Baked
Principled BSDF
BSDF
GGX
Random Walk
Base Color
Subsurface 0.000
Subsurface Radius
Subsurface Color
Subsurface IOR
Metallic 0.000
Specular 0.500
Specular Tint 0.000
Roughness
Anisotropic 0.000
Anisotropic Rotation 0.000
Sheen 0.000
Sheen Tint 0.500
Clearcoat 0.000
Clearcoat Roughness 0.030
IOR 1.450
Transmission 0.000
Transmission Roughness 0.000
Emission
Emission Strength 1.000
Alpha
Normal
Clearcoat Normal
Tangent
Material Output
All
Surface
Volume
Displacement
gltf
glTF Settings.003
Occlusion 0.000
Diffuse
Color
Alpha
Linear
Flat
Repeat
Single Image
Color Space sRGB
Alpha Straight
Vector
Roughness
Color Space Non-Color
Alpha
Normal Map
Tangent Space
Strength 1.000
Color
Normal





AION

Enhancing cyberspace immersion with a visionary prosthetic

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