



- Bachelor Thesis 2022 -

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  yes_.
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- VW Racer One - Augmented racing -

- Felipe Rojas Otero -

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## ABSTRACT

Based on the experience gained during the academic internships at Volkswagen during the year 2021, the proposal to design a Competitive Vehicle concept is generated where Interior Design and Exterior Design are included as the same vehicle unit and not as two different aesthetic and technological packages. The vehicle then acquires a new meaning, understood as an entity that extends the human body of the user acquiring a real symbiosis with the product. With the use of new technologies such as autonomous driving and Artificial Intelligence it will be possible to generate an experience even more exciting and exciting than the one existing today.

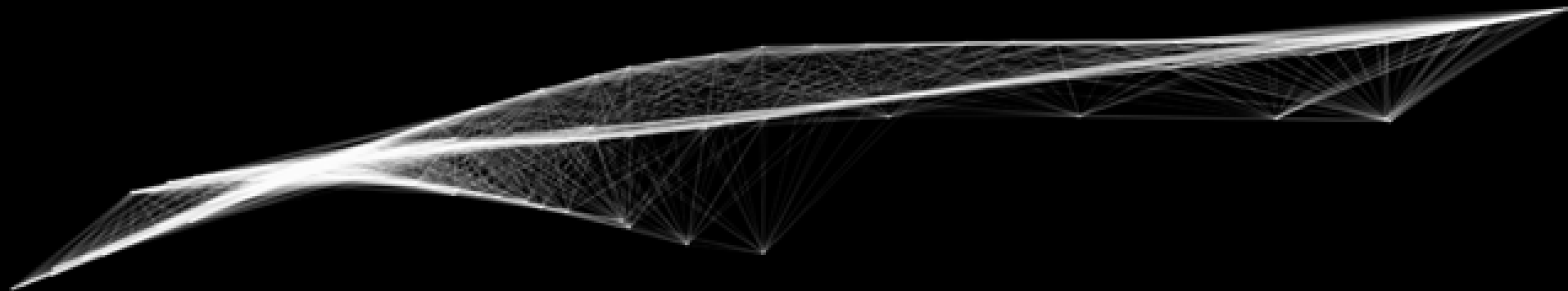
The concept of Competitive Vehicle which includes a new bio-technological combination ,achieves the best possible performance and experience, extending the physical senses not only of the rider but also of all the people involved in the sport.

**Keywords:** bio-technological, entity, symbiosis

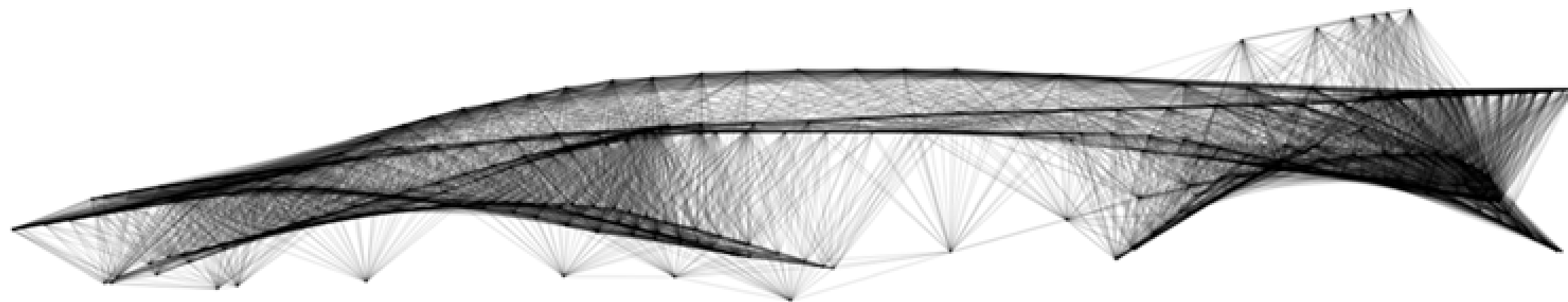
# WHY NEW TECHNOLOGIES WILL CREATE A MORE EMOTIONAL AND EXCITING EXPERIENCE?



# HOW A CONNECTED INTERIOR-EXTERIOR CONCEPT DESIGN WILL EXTEND HUMAN SENSES?



**WHAT POSSIBILITIES WILL BE OFFERED BY THE COMBINATION OF HUMAN AND MACHINE?**



# UNEXPECTED BUT EXCITING FUTURE

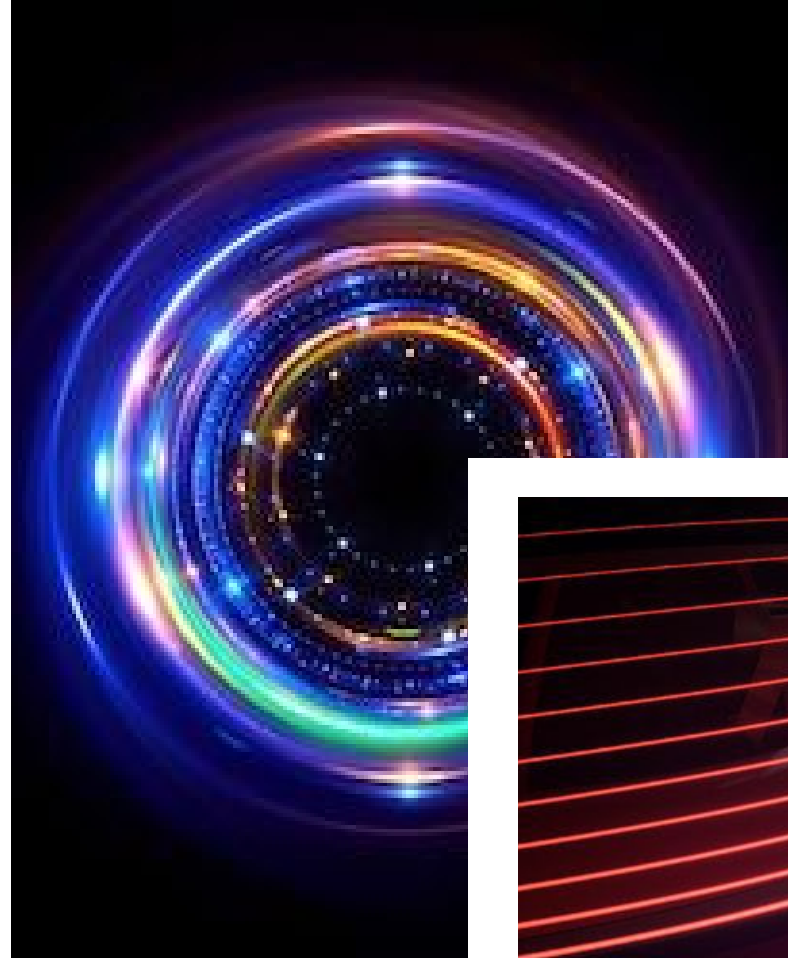
Possibility of combining the best of new  
Technologies and Autonomous Driving to offer a  
complete and much more interesting future for  
Mobility...

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*“Using technology in our advantage”*

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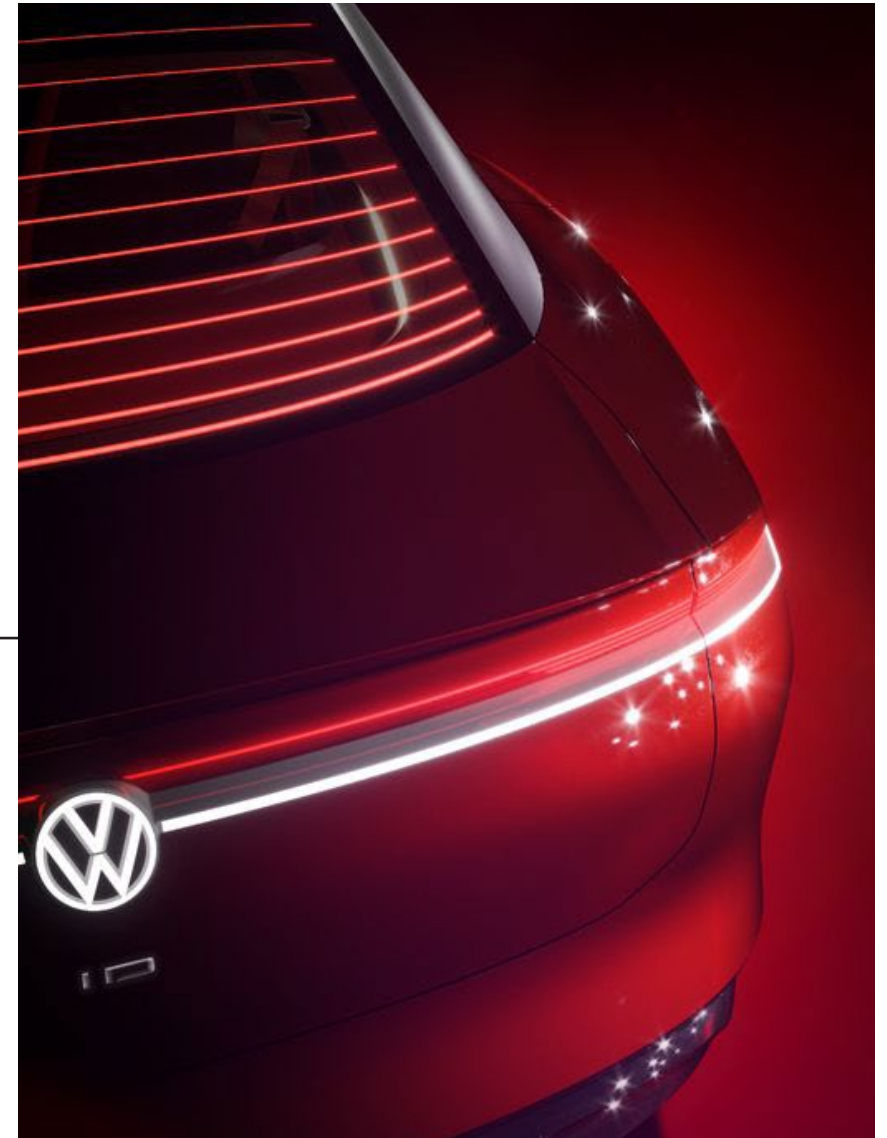
CONCEPT\_AI



ARTIFICIAL  
INTELLIGENCE

:0  
05

AUTONOMOUS  
DRIVING



# POWER OF AI

More challenging, more alive, more entertaining

***DISTANCE***

***CONTROLLED***

***DRIVING***

(Autonomous - Assisted Driving)



Pilots Live is not in Danger - ***More Aggressive and more competitive***

***ARTIFICIAL***

***INTELLIGENCE***



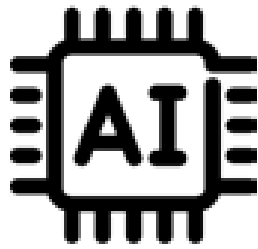
Better Performance, important input - ***Sixth Sense Superpower***

*“A power of perception beyond the five senses, intuition”*

Spectators can live the Race - ***More Human Sport***

# RACING SIMBIOSIS

What about a racing future where the Racer and the Machine **work as one?**, making them faster, more efficient, smarter? almost as if they where the same entity.



Artificial Intelligence



*BIO-TECH RACER*



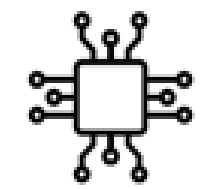
Biological Intelligence



# NEW AUTONOMOUS MODE



Human Driver



Artificial Intelligence

**1.**

Assisted Driving

**2.**

Automated Mode

**3.**

Autonomous Mode

**4.**

Biomimetic mode



# PROJECT CONCEPT

Concept Brief

:1  
00

# PROBLEMATIC

Autonomous technology is considered the next must step of Transport Design. It makes it more efficient , more secure and offers a new experience surrounding transportation, nevertheless it is feared that this will offer a less *Emotional* and *less Exciting* experience as it is today...



# CONCEPT

*Interior and Exterior as a **Single Responsive** Entity*

:1  
09



# COMPETITIVE RACING

03

*Most emotional context. / Historically **best test ground** of new tech. / Involves a **complete ecosystem**.*





# UNIFIED EXPERIENCE



:1  
04



## NEW RACING ERA

Scientists in the future are able to create a new **Metamaterial** able to store energy from surrounding vibrations such as **sound** and different **electromagnetic** waves. This is achieved with an internal crystalline structure, offering the possibility of having **Piezoelectric** properties.

This material discovery created a new era of **energy harvesting**, giving the possibility of implementing this technology in the race vehicles and racetrack itself. With each lap, with each race, with each victory, the pilots, the teams and the fans are able to enjoy the sport and also generate energy for their city.

This is a new **Human powered** Racing future



**BE FAST**  
**BE ENERGETIC**  
**BE HUMAN**

# THE GOAL

Improve Autonomous Driving experience.  
To anyone. Anywhere

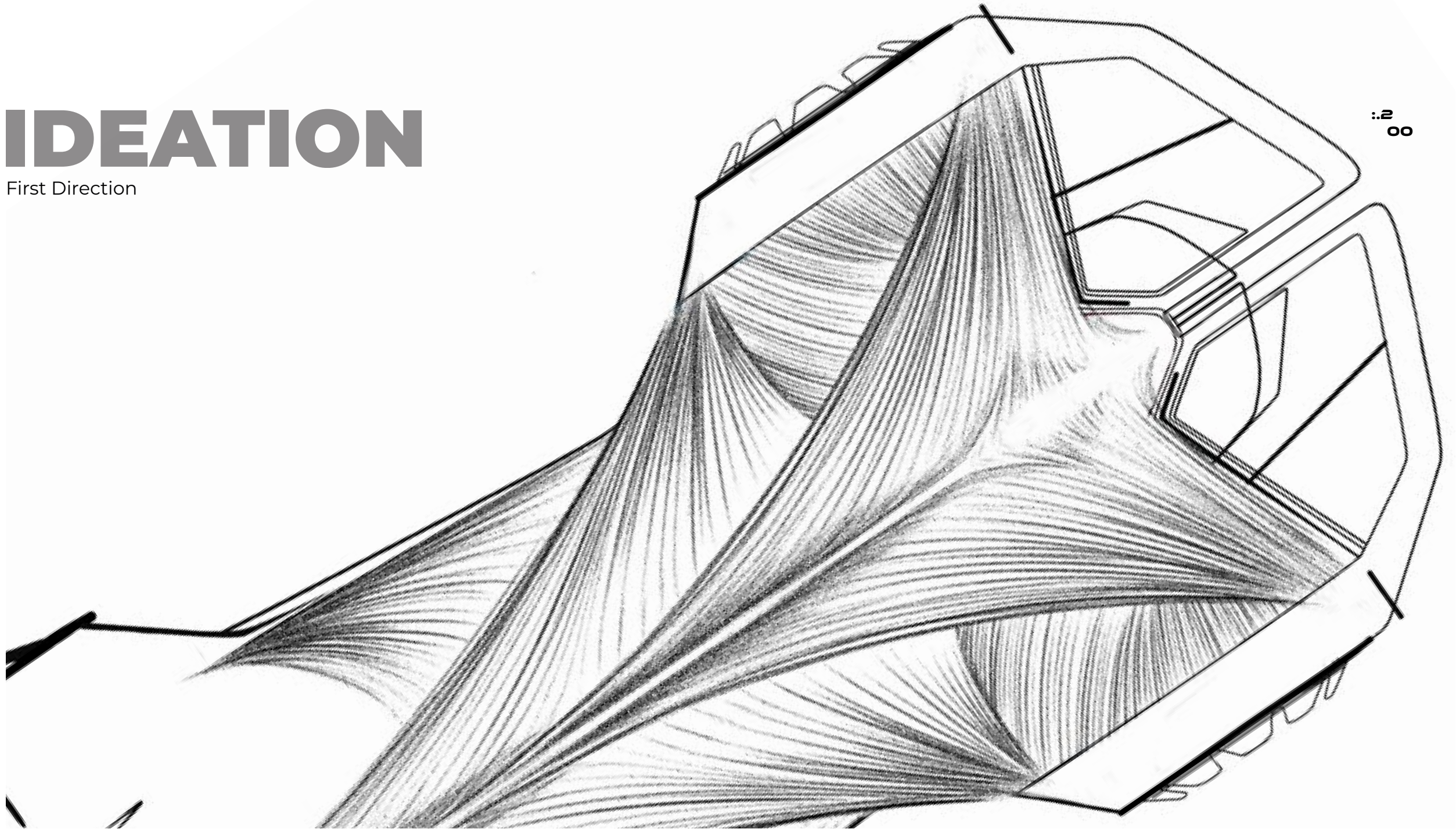
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      Improve  
};  
      if(+1000){  
      if(Stark){  
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} Human {  
      FEEL[X10][44,5%],x){  
      if(link established){  
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};  
      status(-0.37){  
      -TA/ ( Action )){  
      protect(user);  
      if  
      Reactions+= Joy;  
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      if(-GP){  
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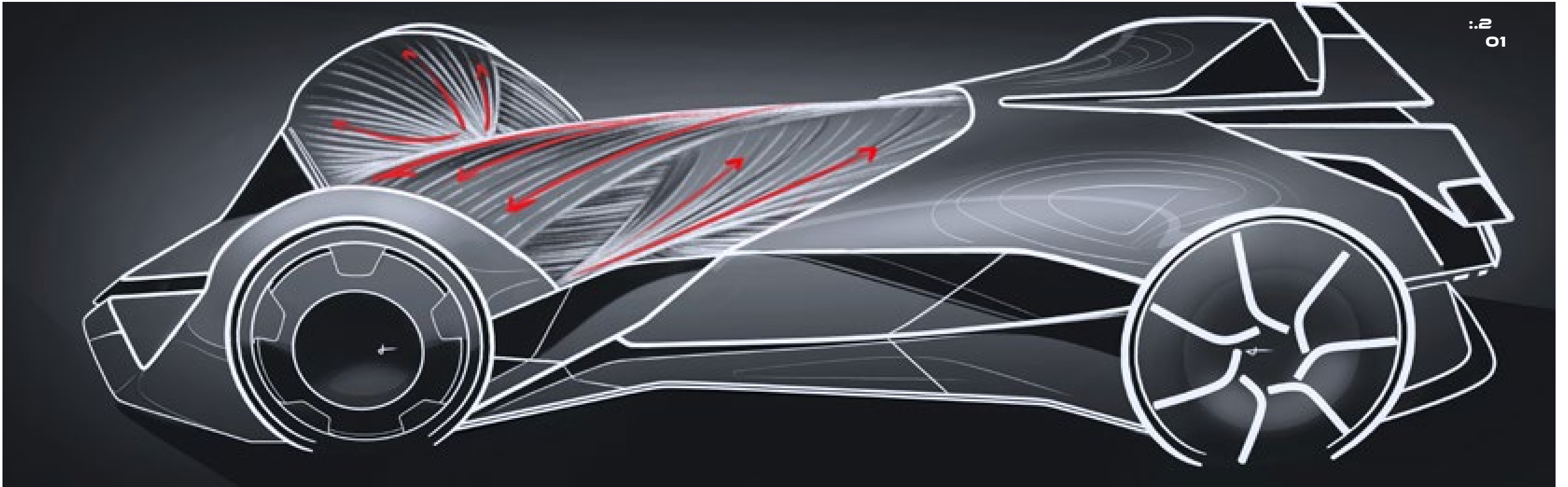
# IDEATION

First Direction



# EXPLORATION

Structure and Composition

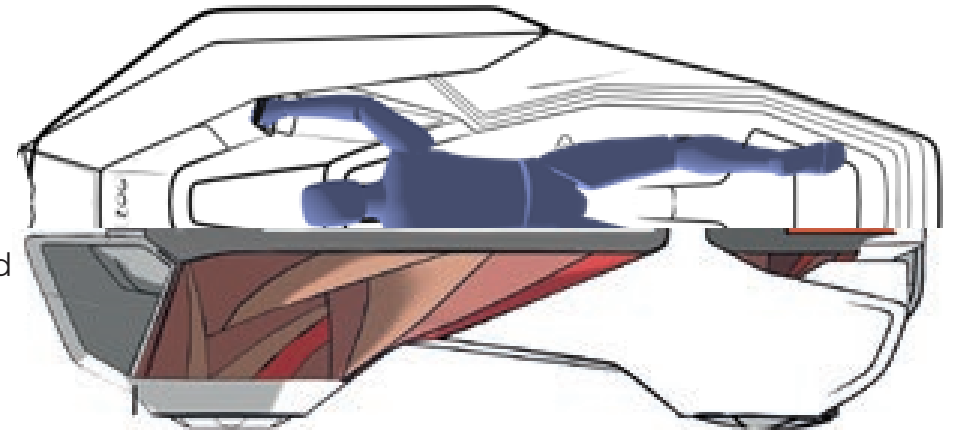


## Human and Maschine

The exterior design of the vehicle seeks to achieve the formal integration of the artificial language "Machine" and organic "Human. »

The exterior aesthetic reflects what happens to the rider in real time and how their movements and desires affect their AI partner on the Race-Track, considering how they see, feel and move during the race.

The interior aesthetics will integrate a 2nd skin concept, taking advantage of the sensory design and bone vibration to make autonomous and remote-controlled driving as real as possible



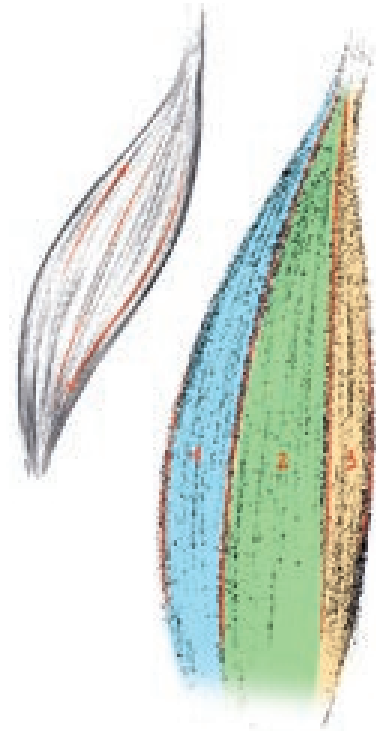
# EXPLORATION

Structure and Composition

02



*Composite superposed structure*



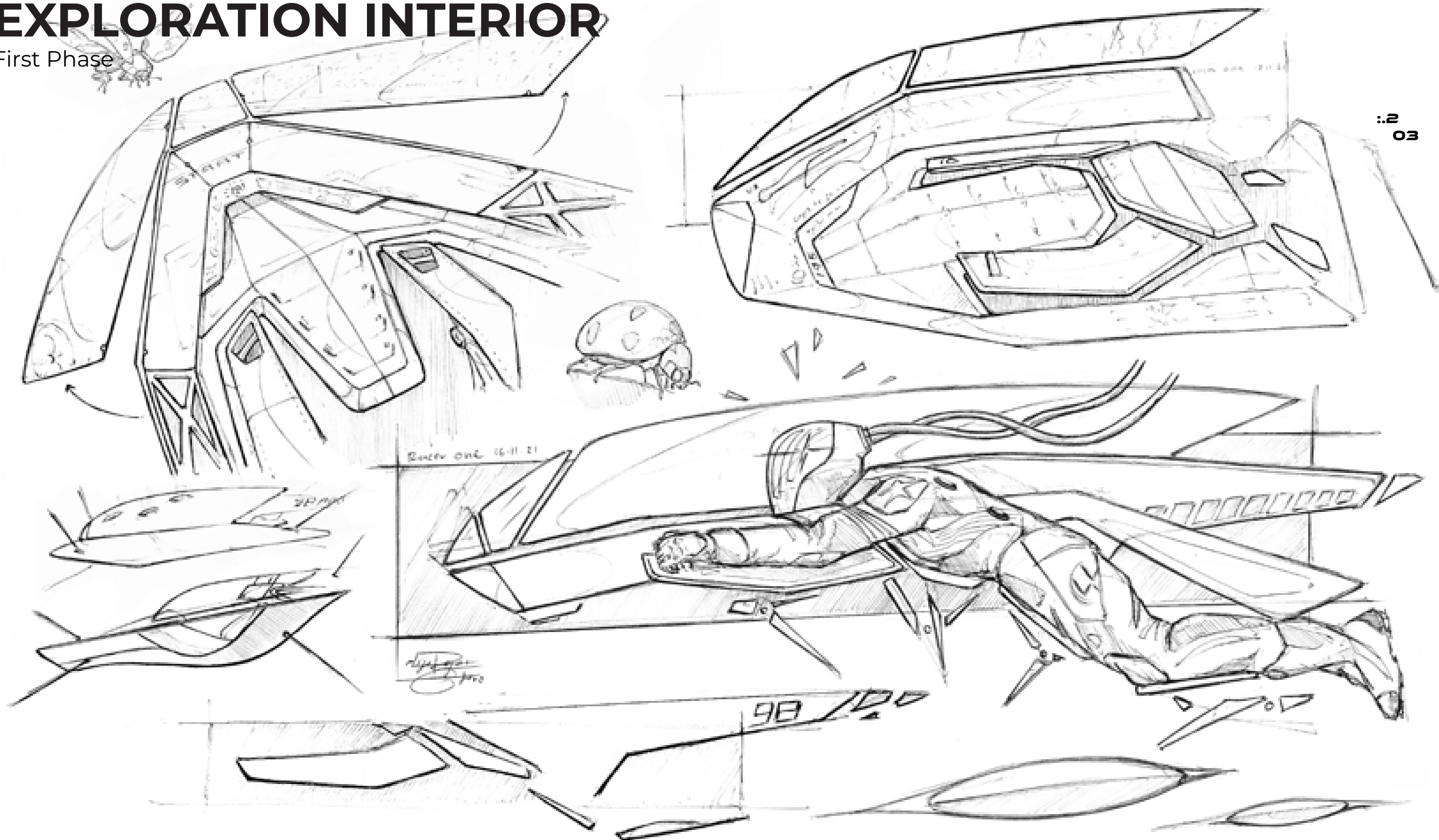
*Different arrangement of fibres*





# EXPLORATION INTERIOR

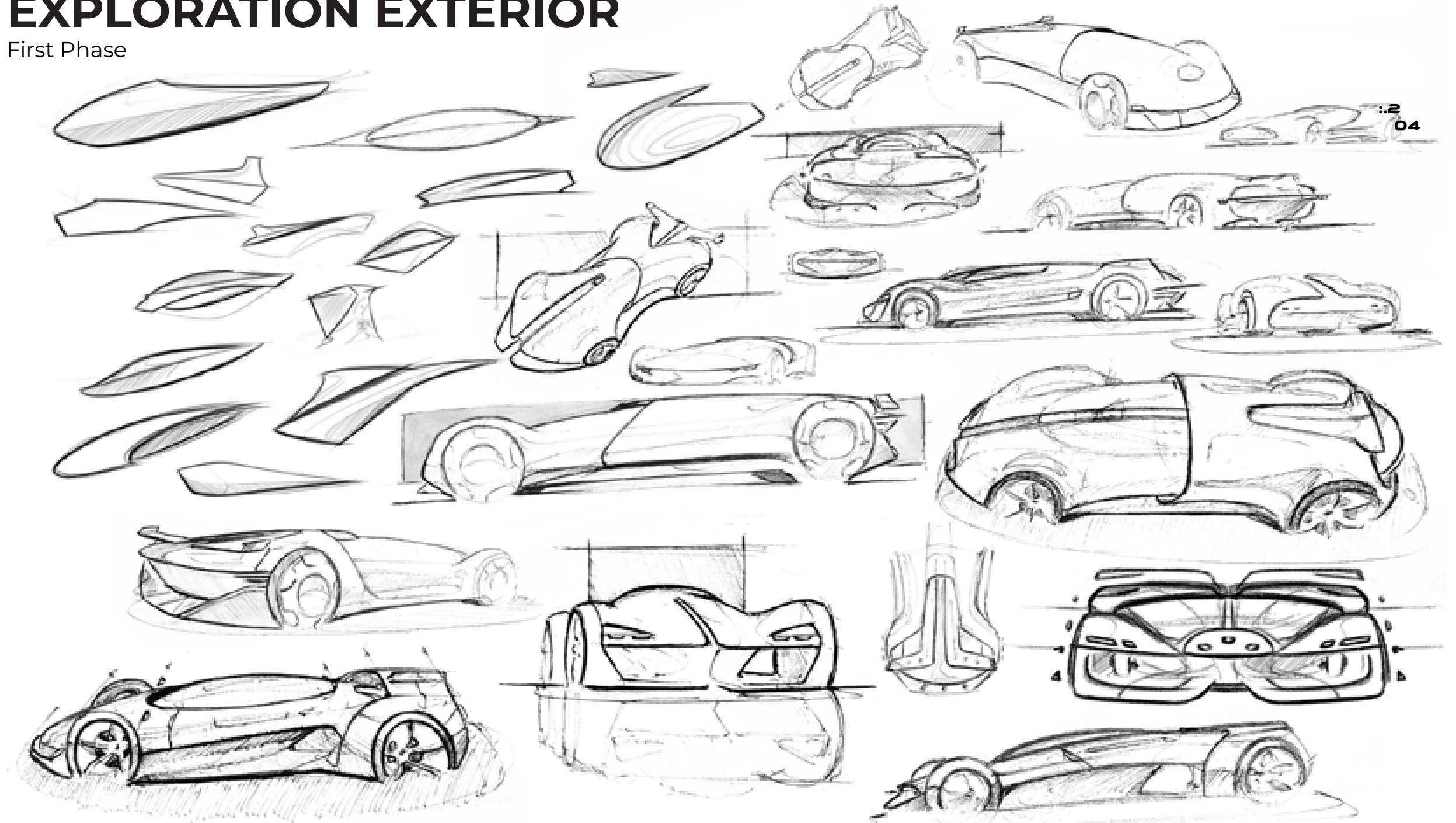
First Phase



02  
03

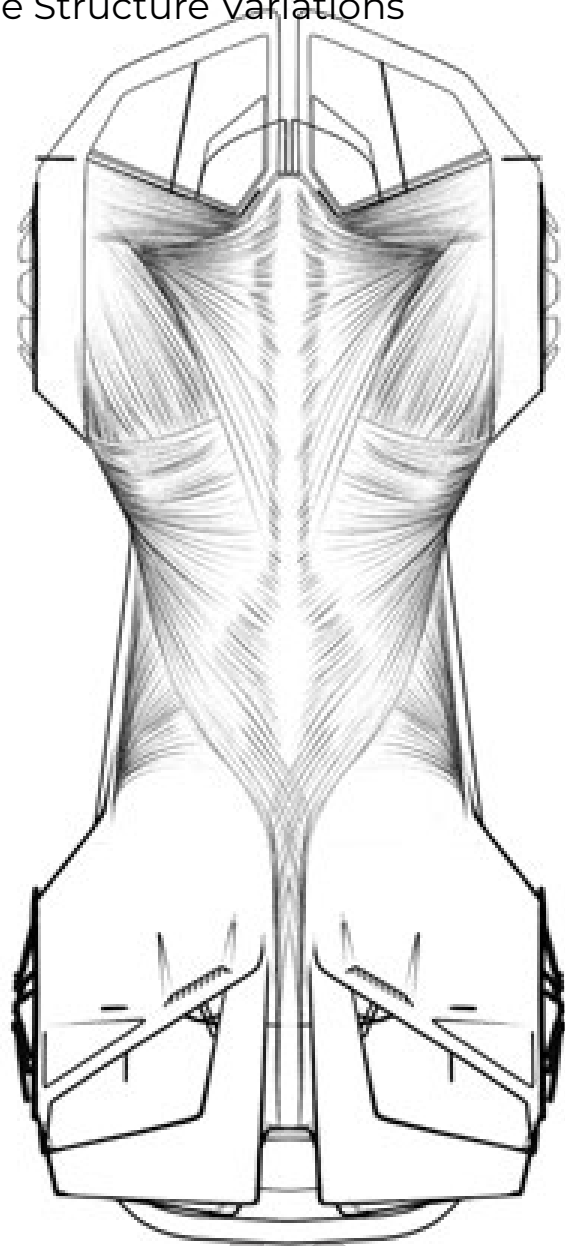
# EXPLORATION EXTERIOR

First Phase

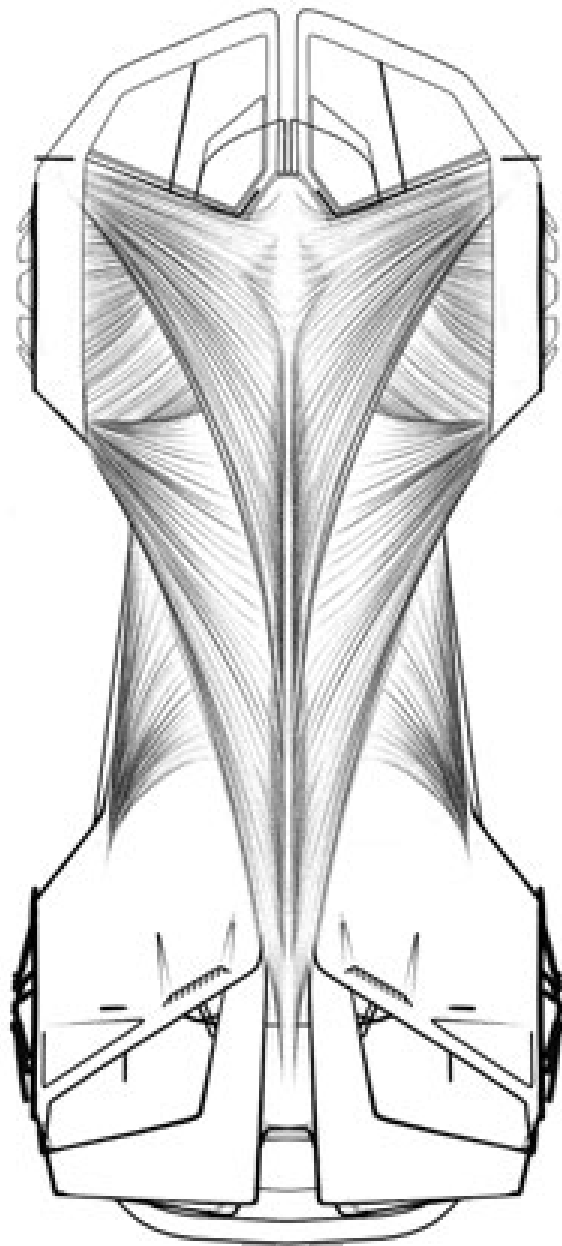


# EXPLORATION

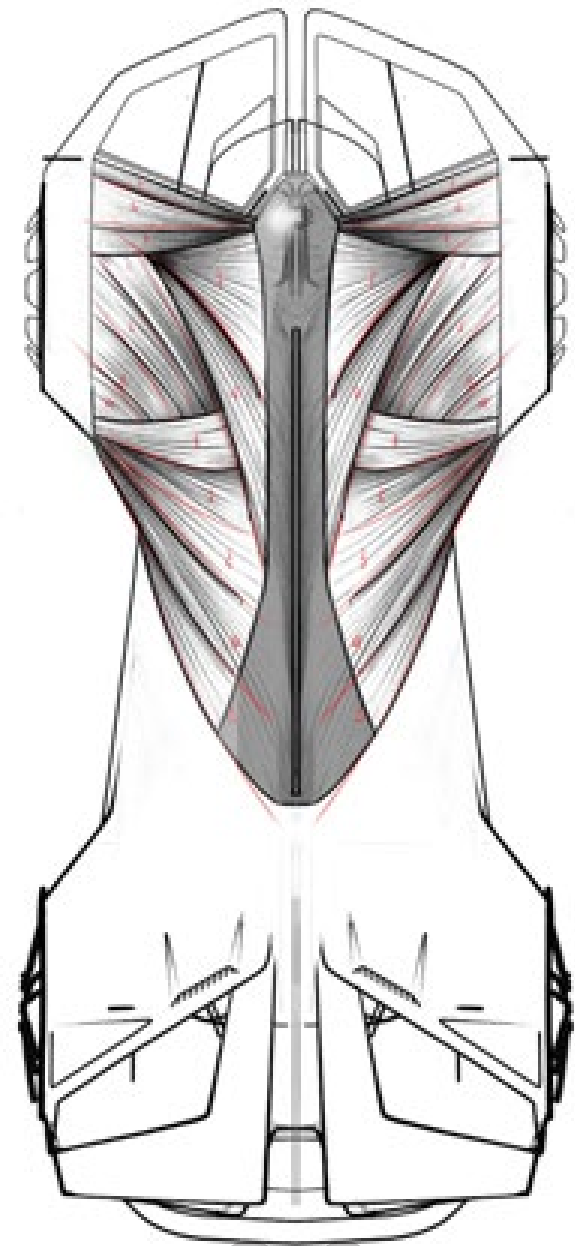
Muscle Structure Variations



1.0



1.1

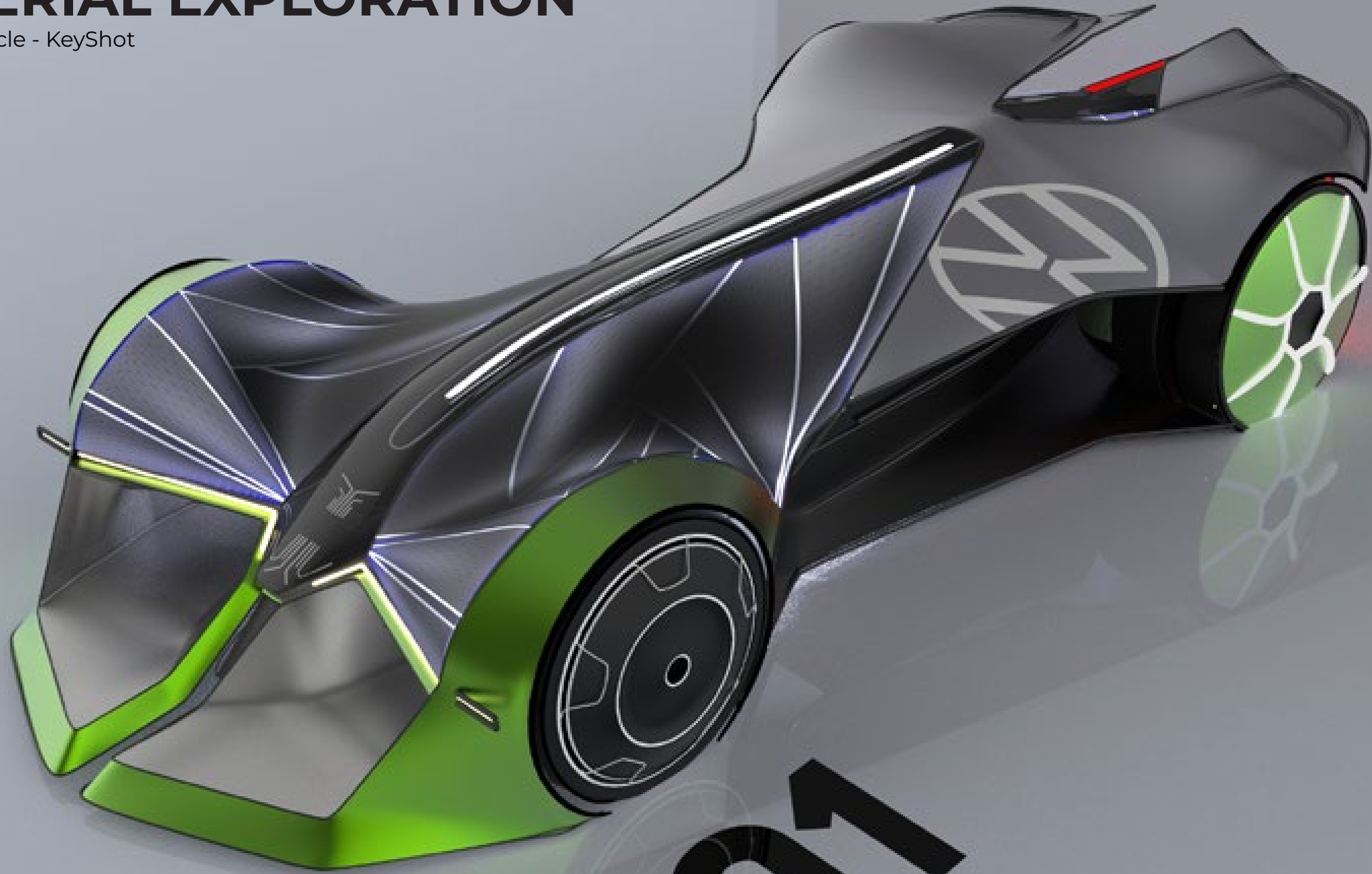


2.0

05  
:2

# MATERIAL EXPLORATION

Artificial Muscle - KeyShot

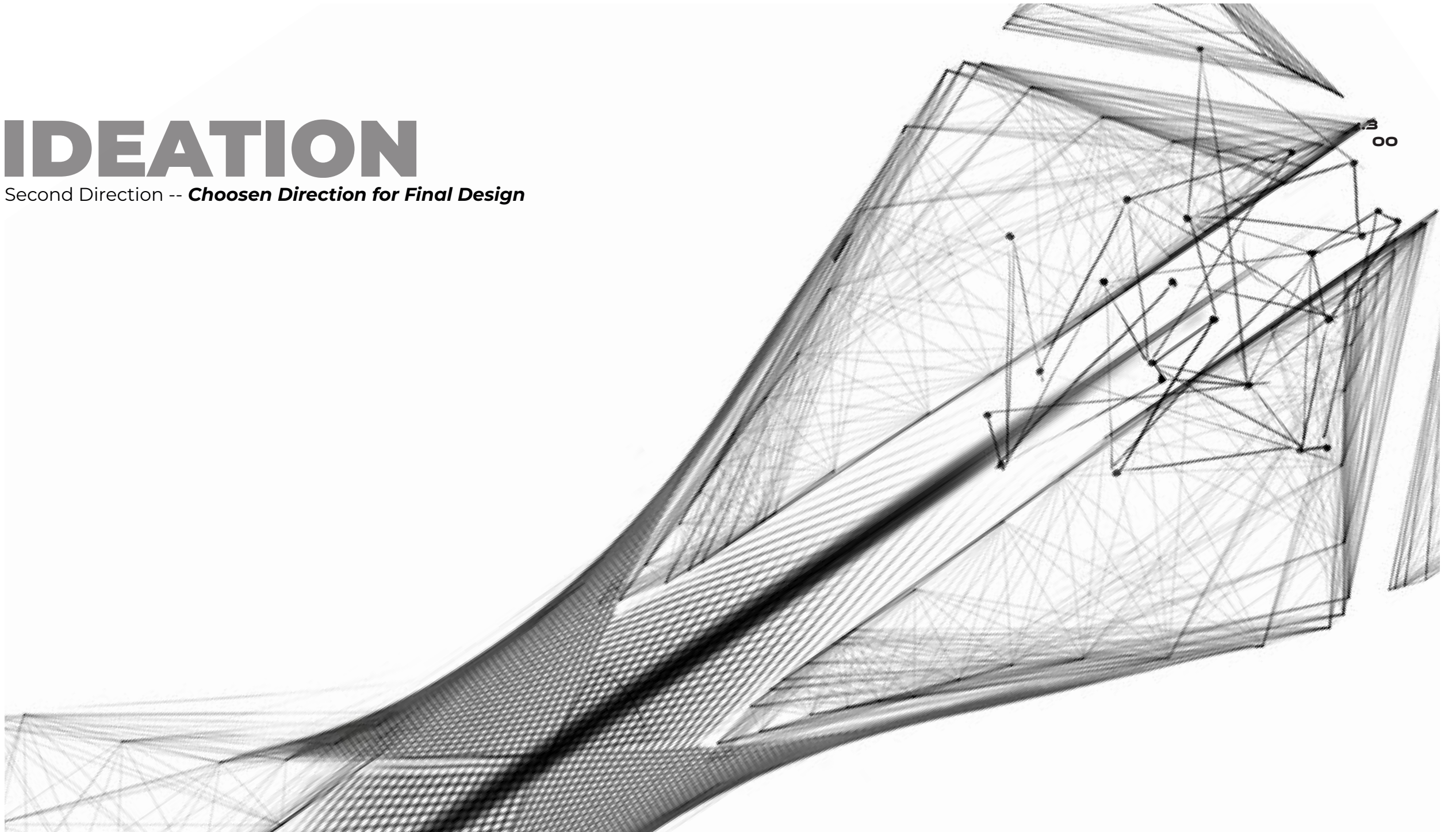


02  
06

01

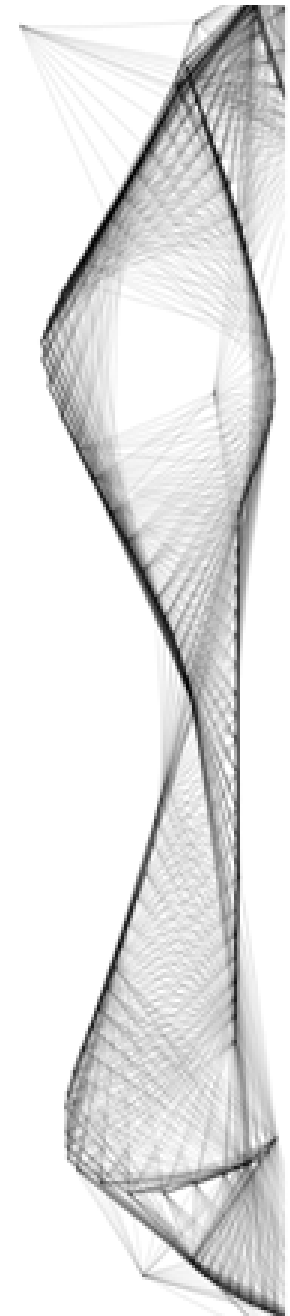
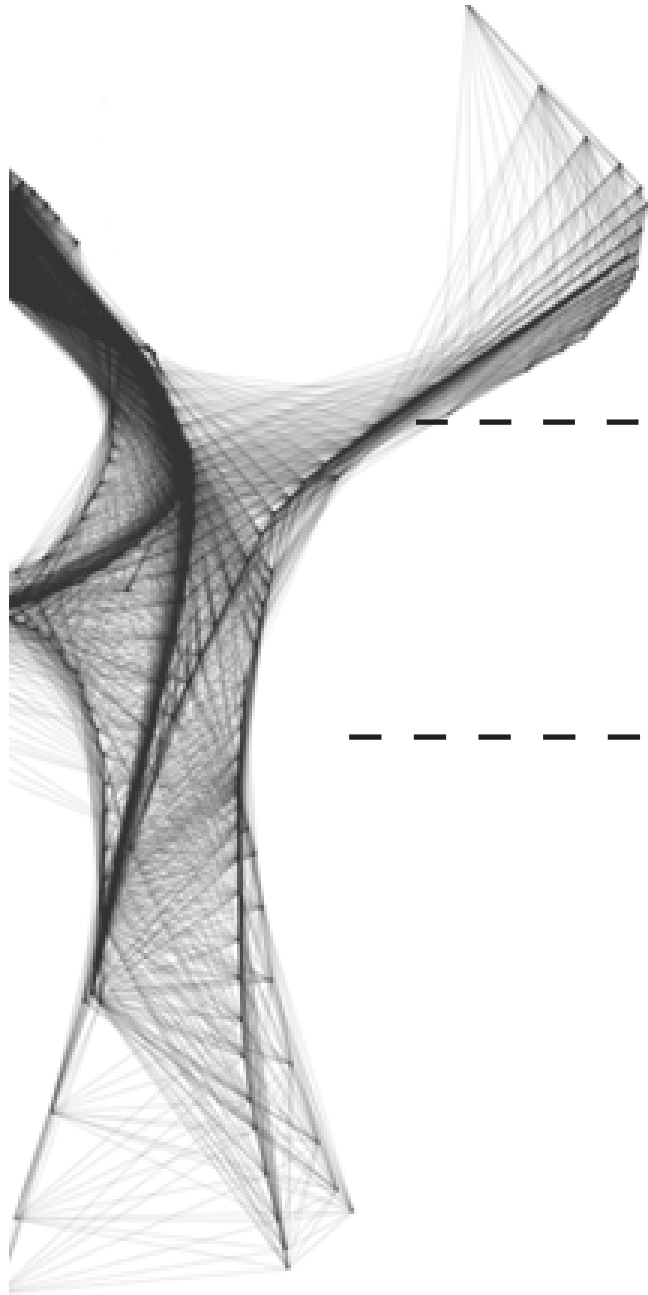
# IDEATION

Second Direction -- *Chosen Direction for Final Design*





# DIRECT CONNECTION BETWEEN BODY AND MIND



01

***MIND** - Sensor Nuerons (ESTIMULES)*

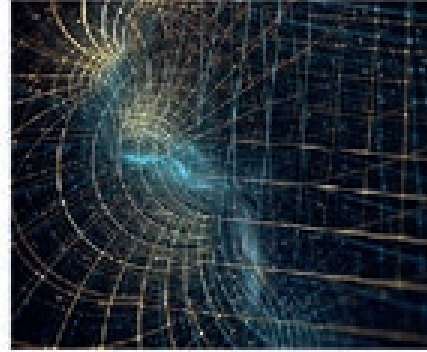
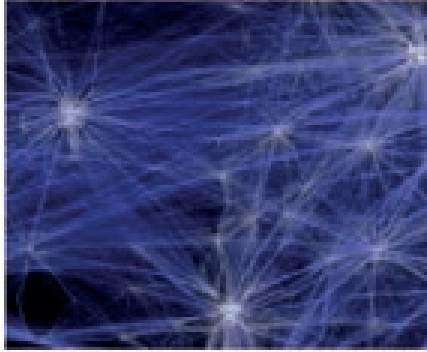
***BODY** - Motal Neurons*

*"Keep the bond even stronger between man and machine"*

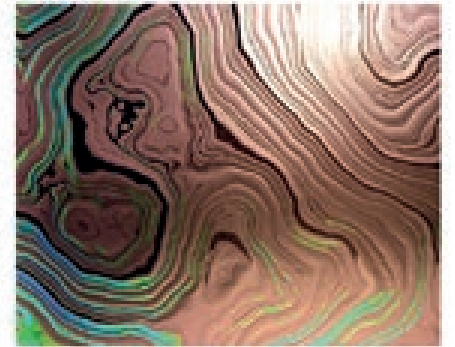
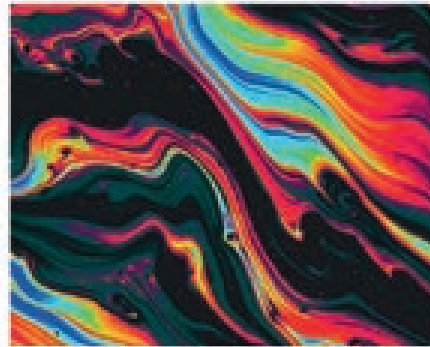
# EXPLORATION

Structures and Patterns

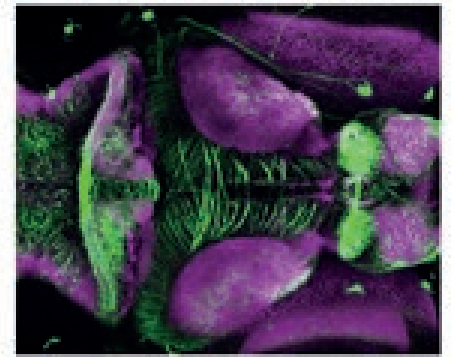
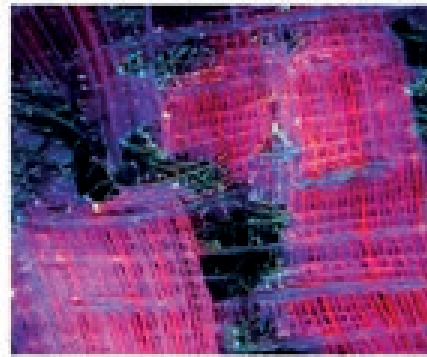
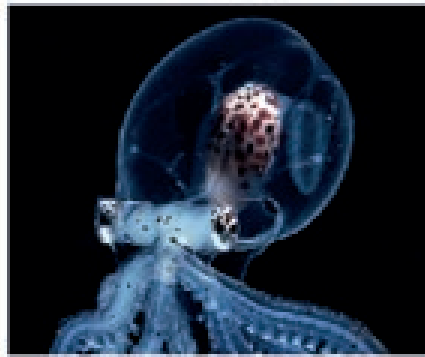
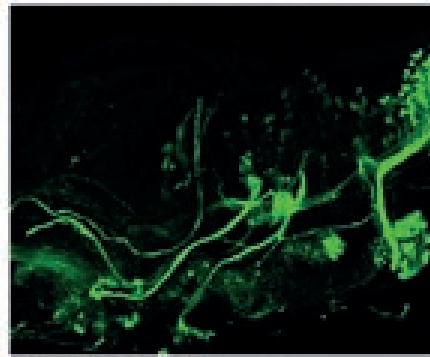
Structural



Fabric



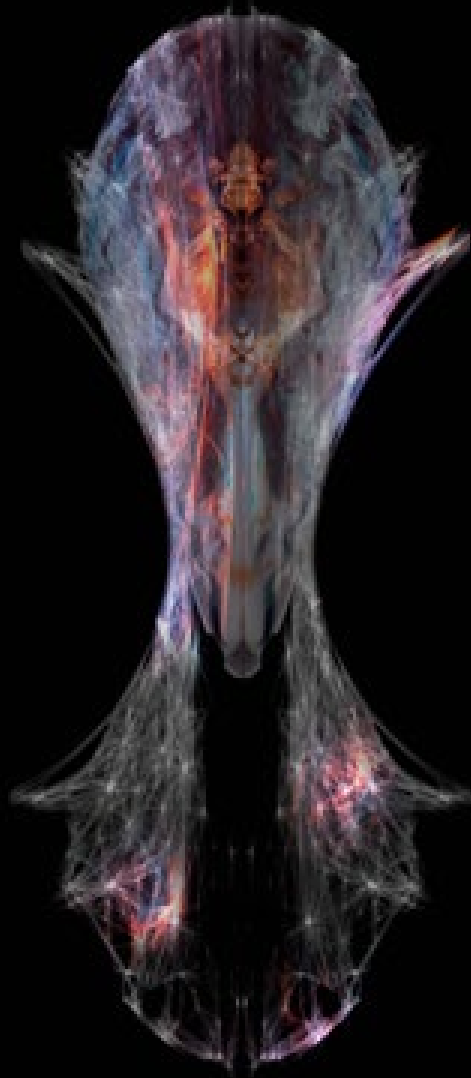
Organic



# EXPLORATION

Structure and Composition

1.



**VW-RO**  
AUGMENTED RACING

2.



3.



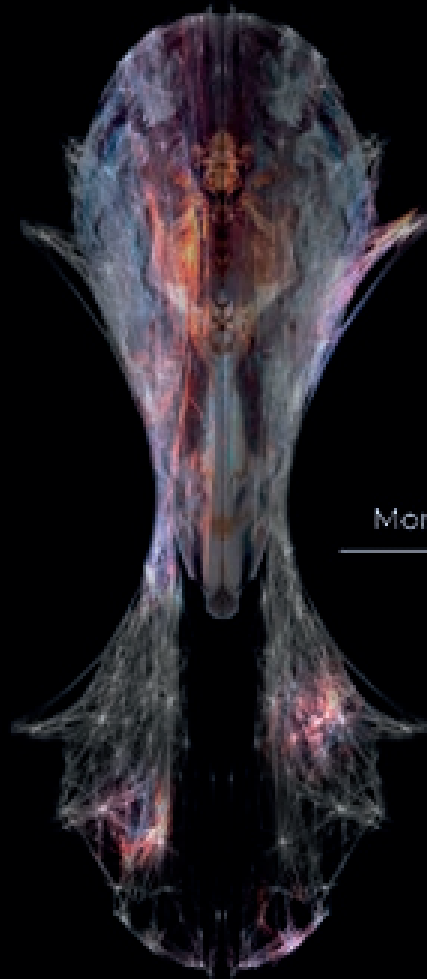
03  
:3

Compositions of organic shapes

# INTERPRETATION A

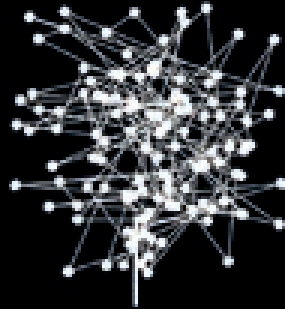
Movement and Stimulation

1

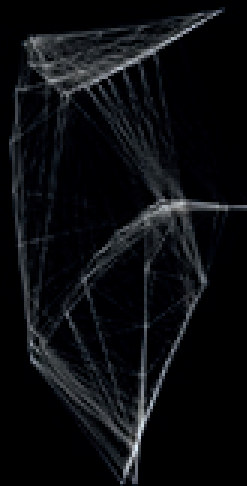


VW-RO  
AUGMENTED RACING

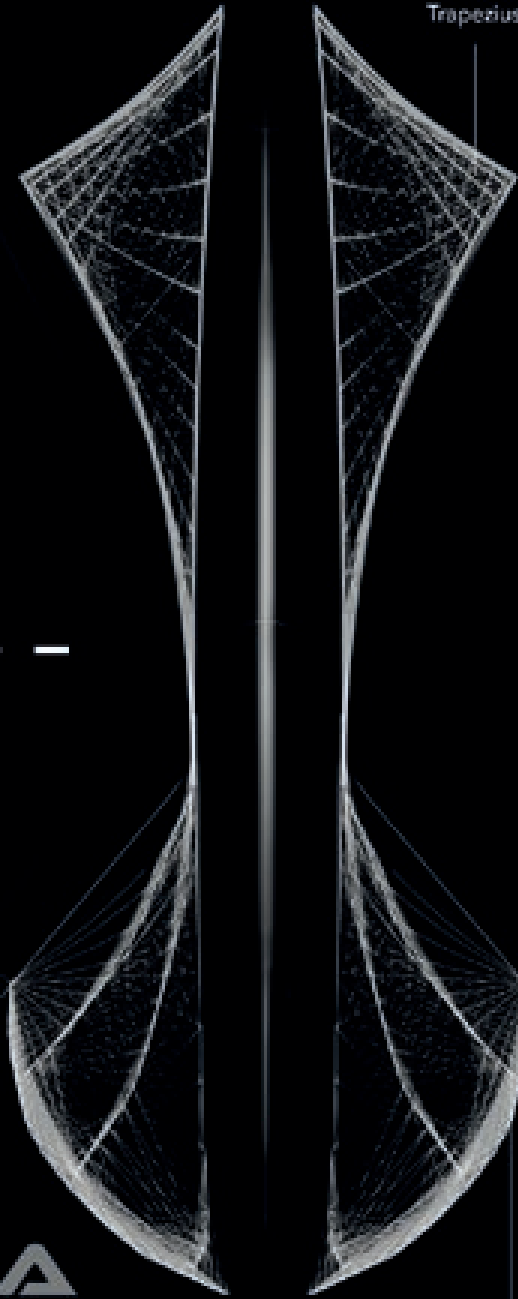
Computer-inspired texture



Monitoring of abstract muscle movements



A



Trapezius

Latissimus dorsi

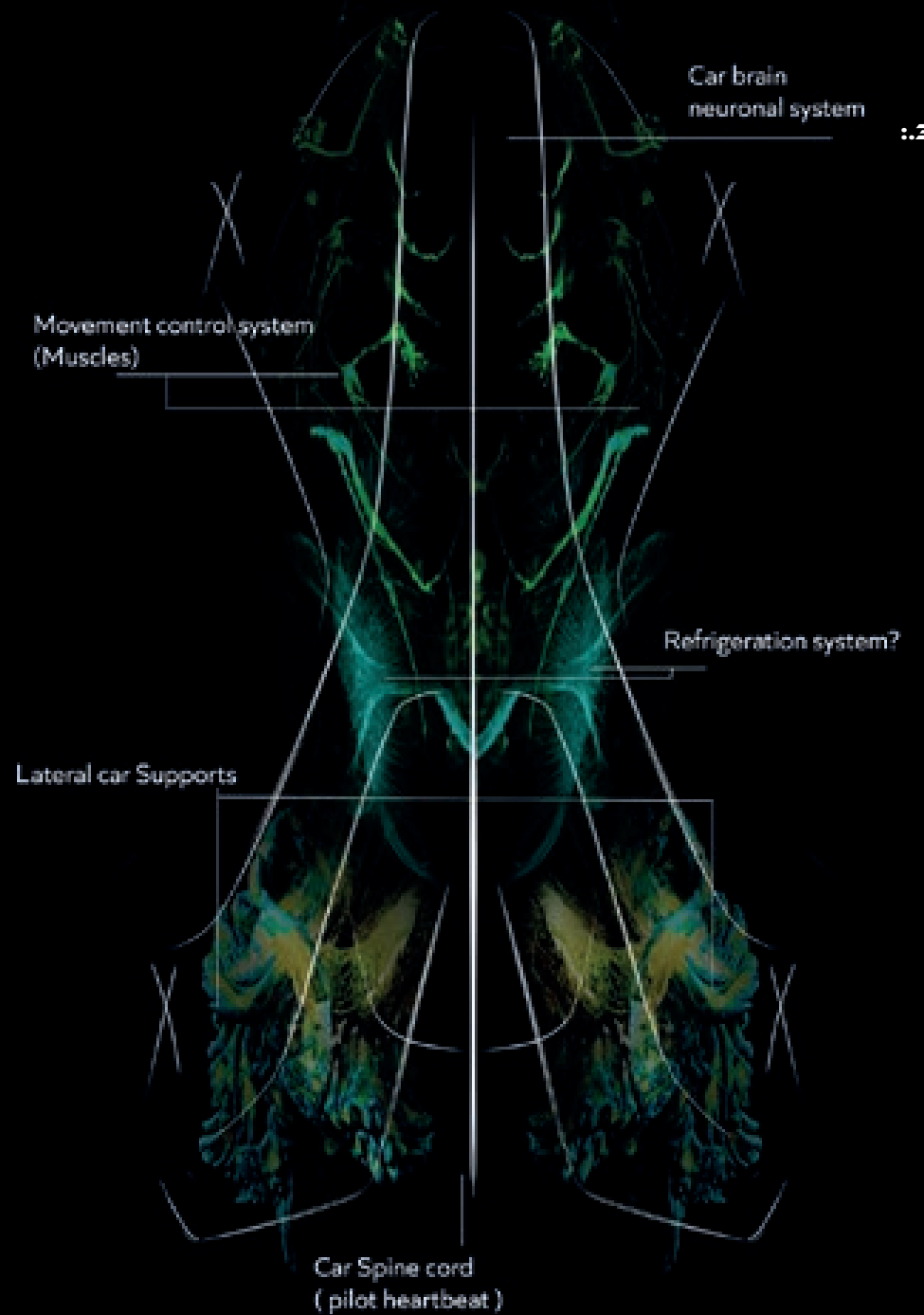
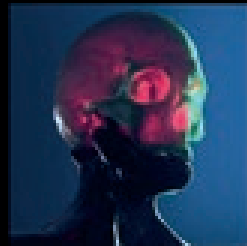
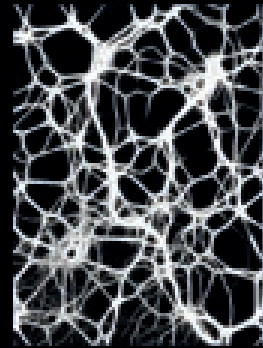
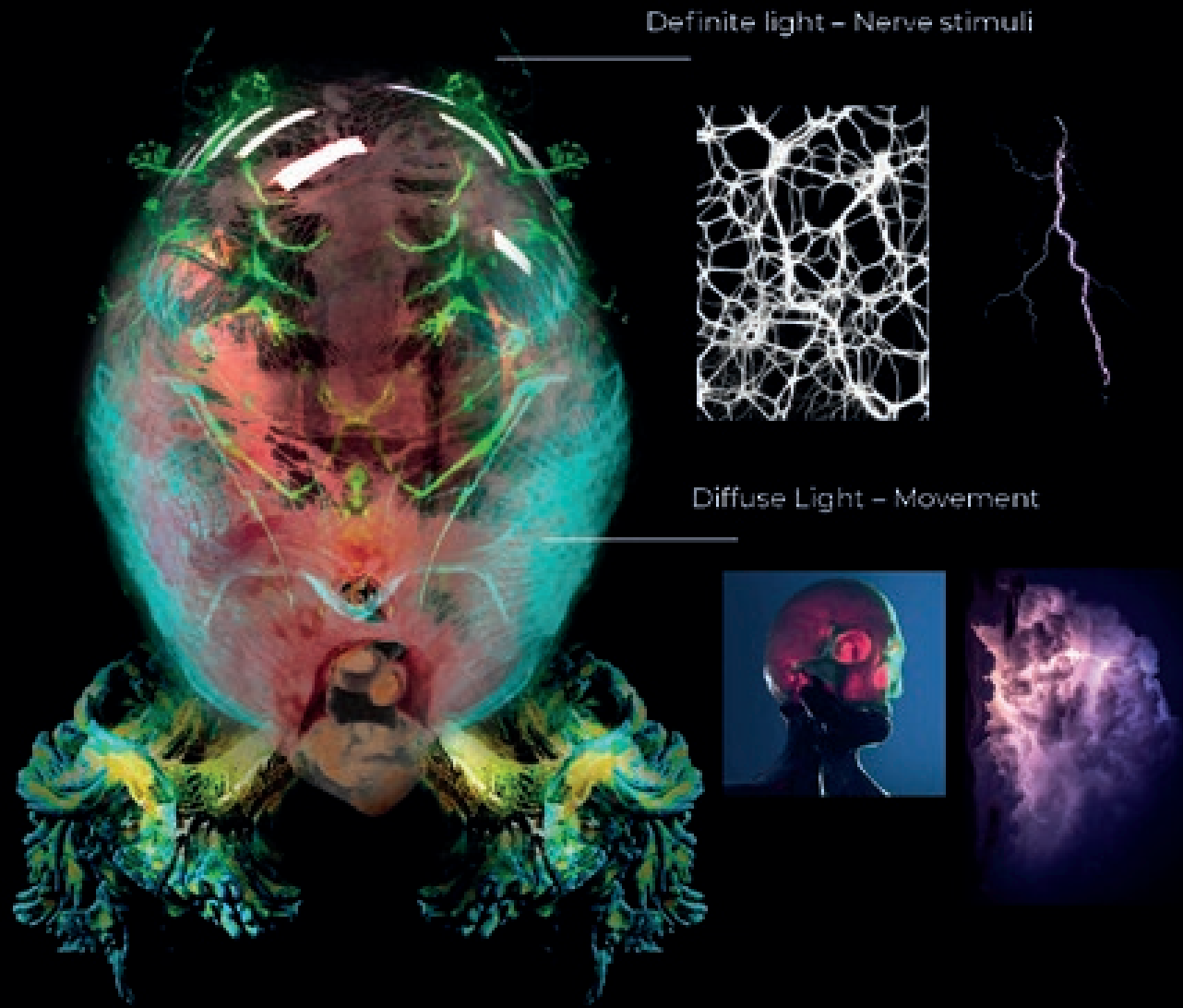
B

Sternocleidomastoideus

03  
04

# INTERPRETATION B

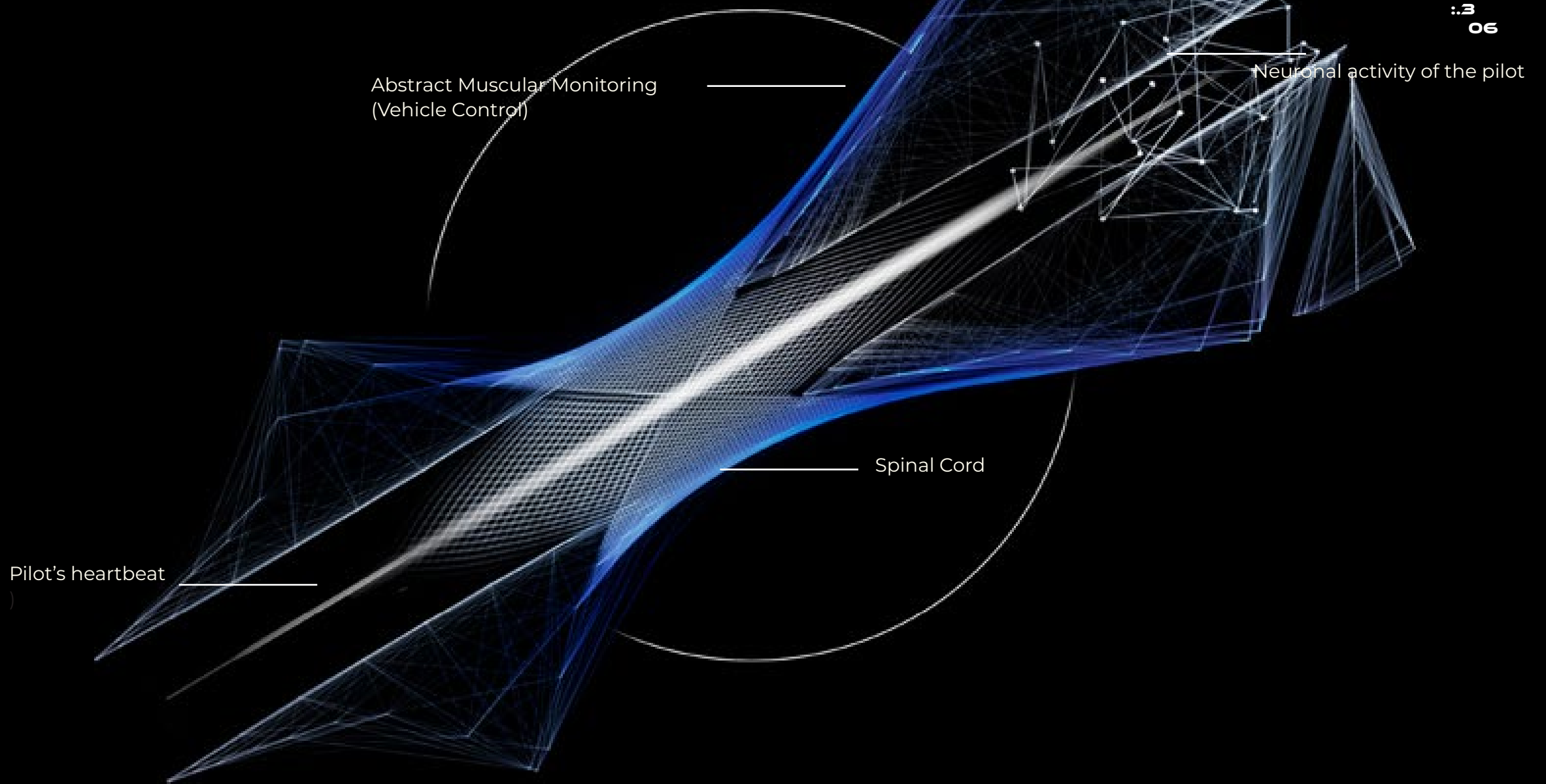
Movement and Stimulation



05

# CHOOSEN DIRECTION

Key Sketch Exterior



Abstract Muscular Monitoring  
(Vehicle Control)

Neuronal activity of the pilot

Spinal Cord

Pilot's heartbeat

06

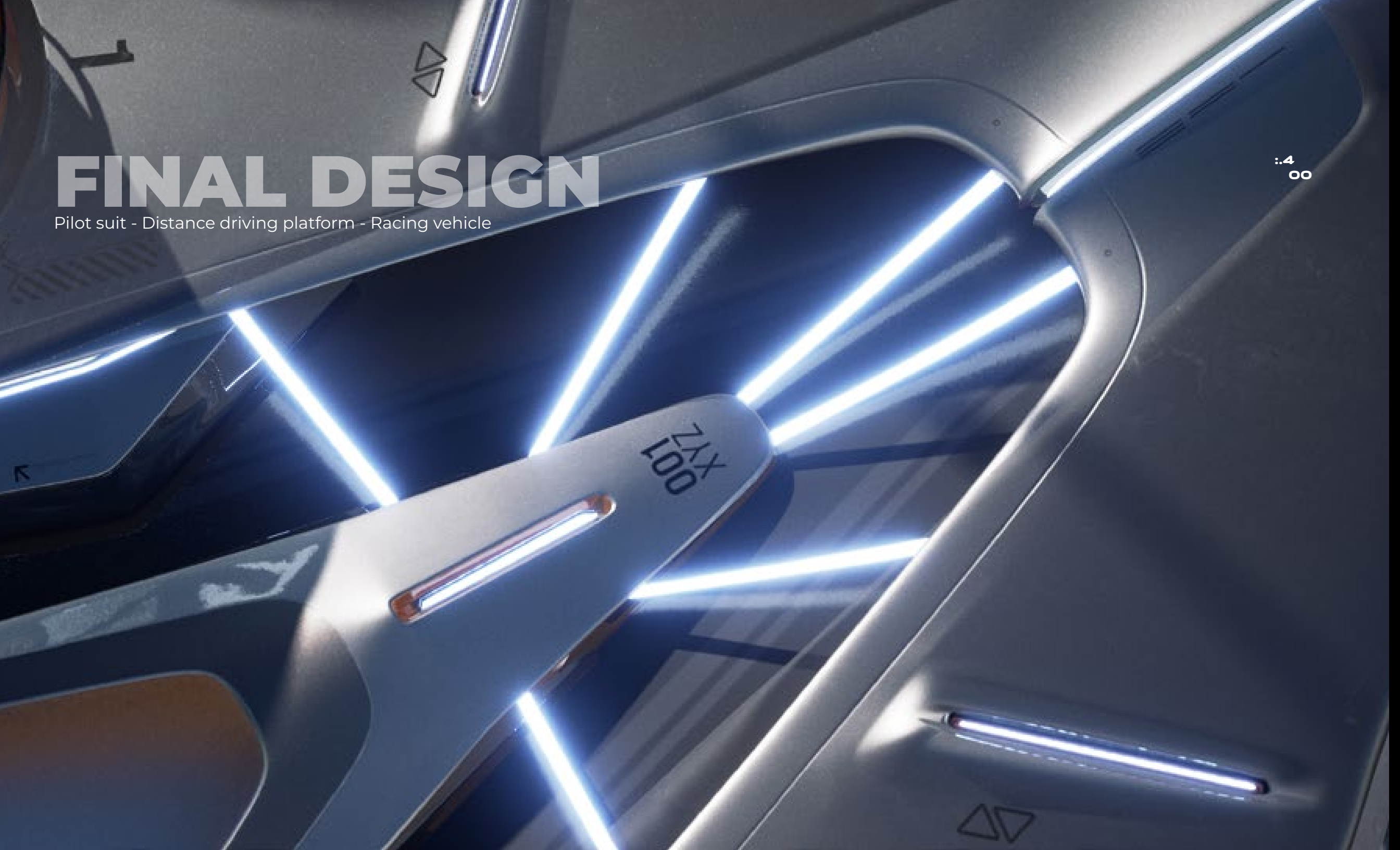
Key Sketch top view

# FINAL DESIGN

Pilot suit - Distance driving platform - Racing vehicle

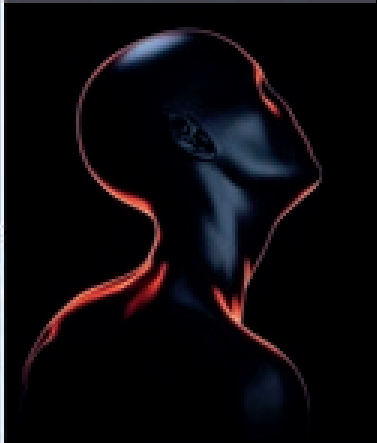
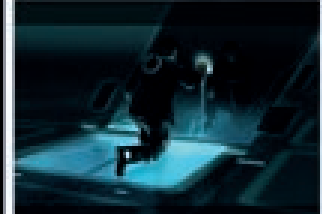
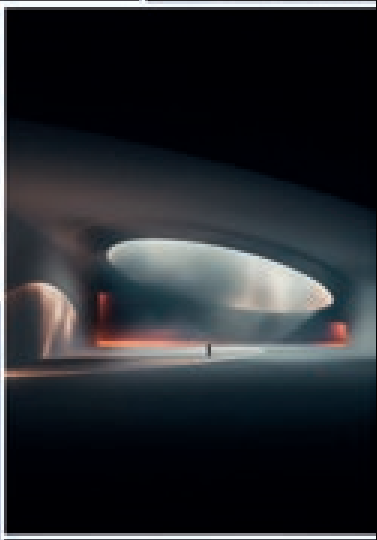
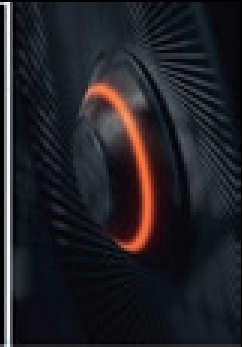
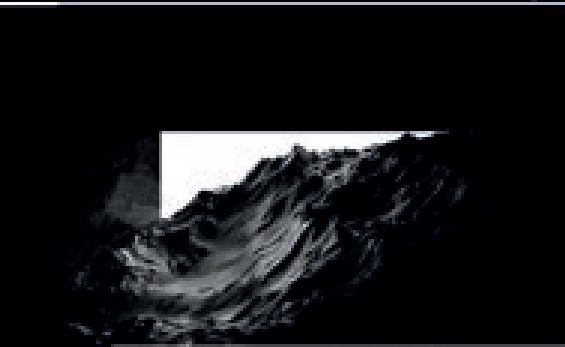
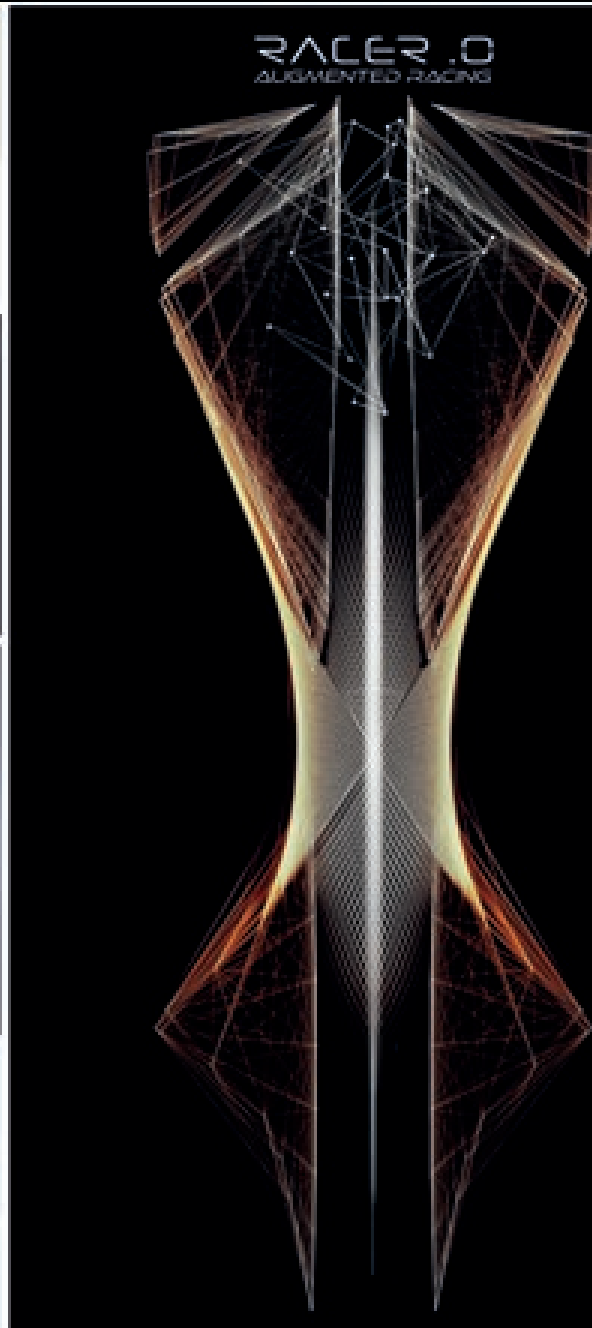
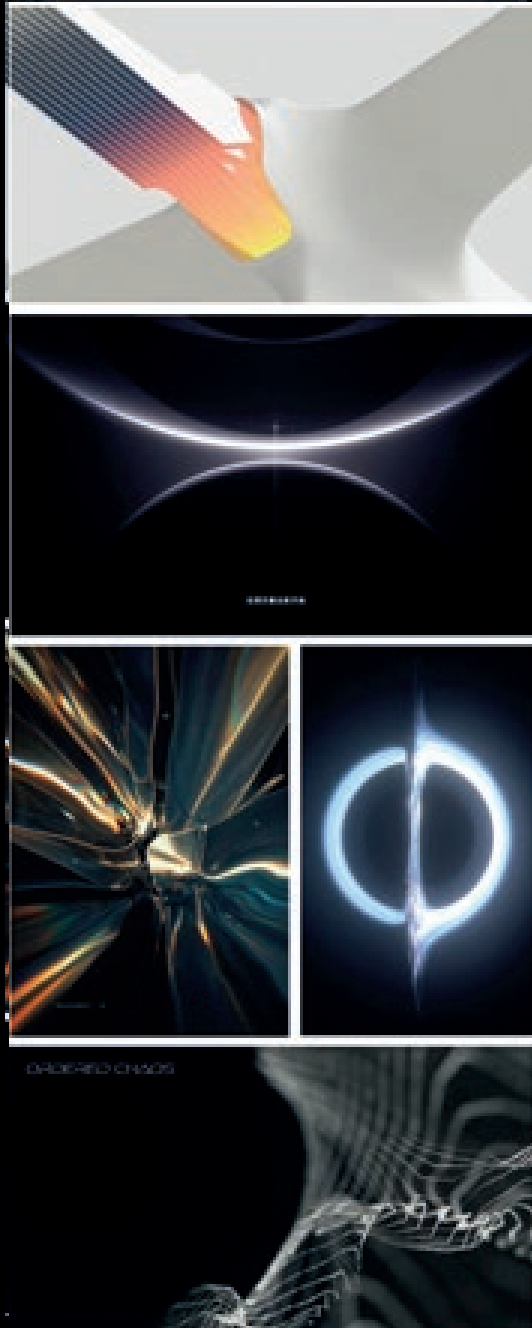
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001  
XYZ





# MOODBOARD



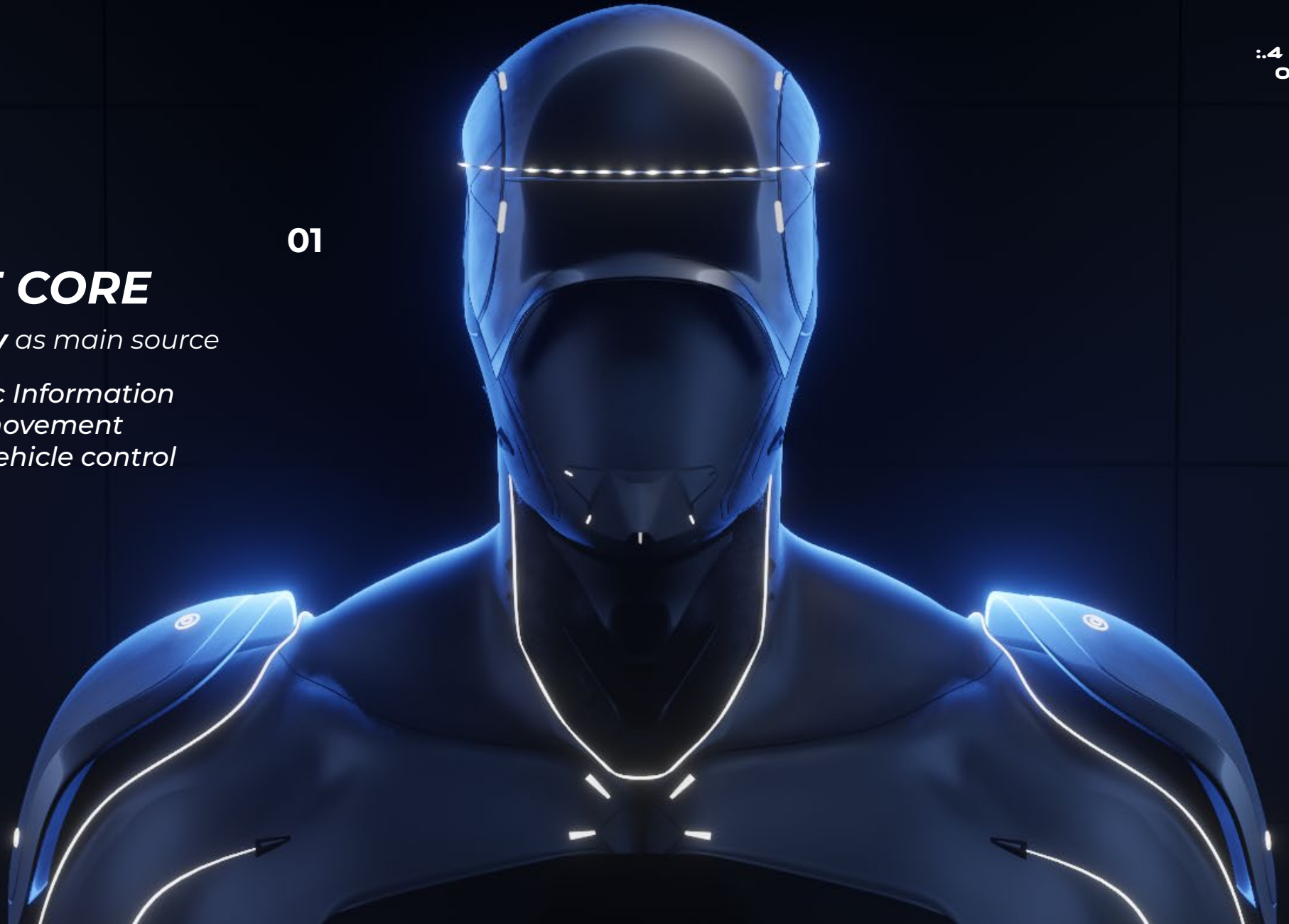


01

## ***THE CORE***

***Human Body*** as main source

- *Biometric Information*
- *Muscle movement*
- *Racing Vehicle control*
- *Energy*
- *Emotion*



# AI INSPIRATION INTERIOR

Midjourney



*- Digital, technology muscle with illuminated filaments and diffuse surface -*

Dual transparent material /  
2nd skin layer /  
Functional focus composition /  
Technologic Minimalism /

# PILOT SUIT

Connection between Interior and Exterior



# ***MOVEMENT REINFORCEMENT***

movement control by Digital Strings





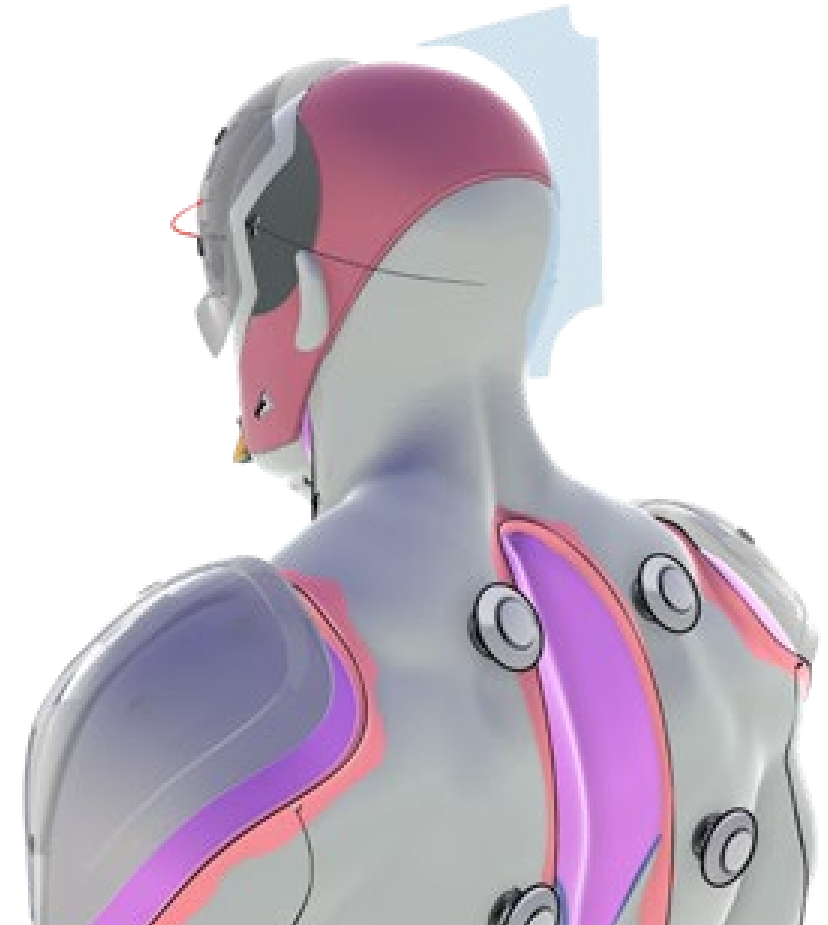
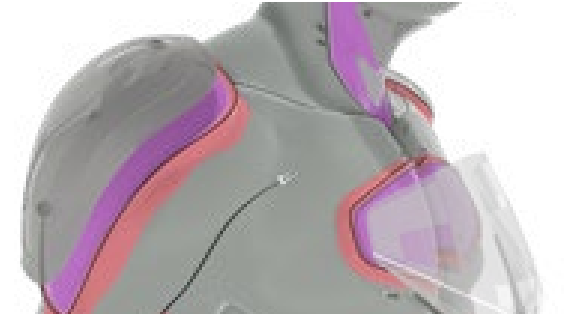
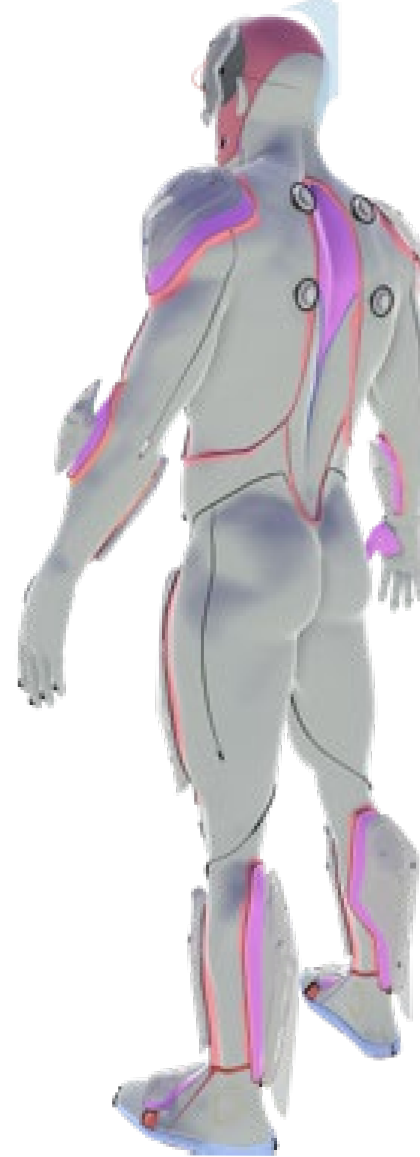
## **HELMET DESIGN**

*Spectator - Technician - Pilot*



# PILOT SUIT MODELING

Gravity Sketch



04  
07

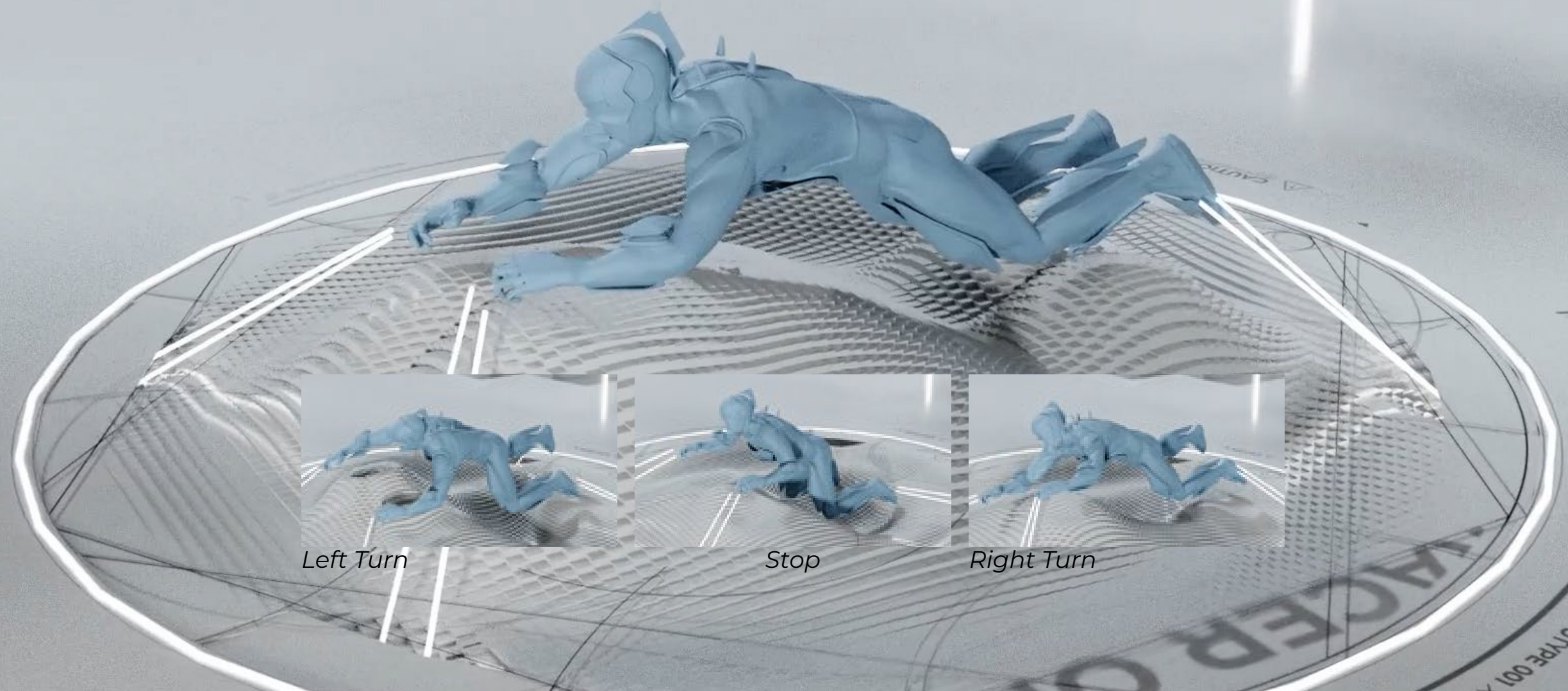
03  
**DISTANCE  
DRIVING  
PLATFORM**



# DISTANCE DRIVING PLATFORM

Adaptive Distance control platform

04  
09



Left Turn

Stop

Right Turn

PROTOTYPE 001

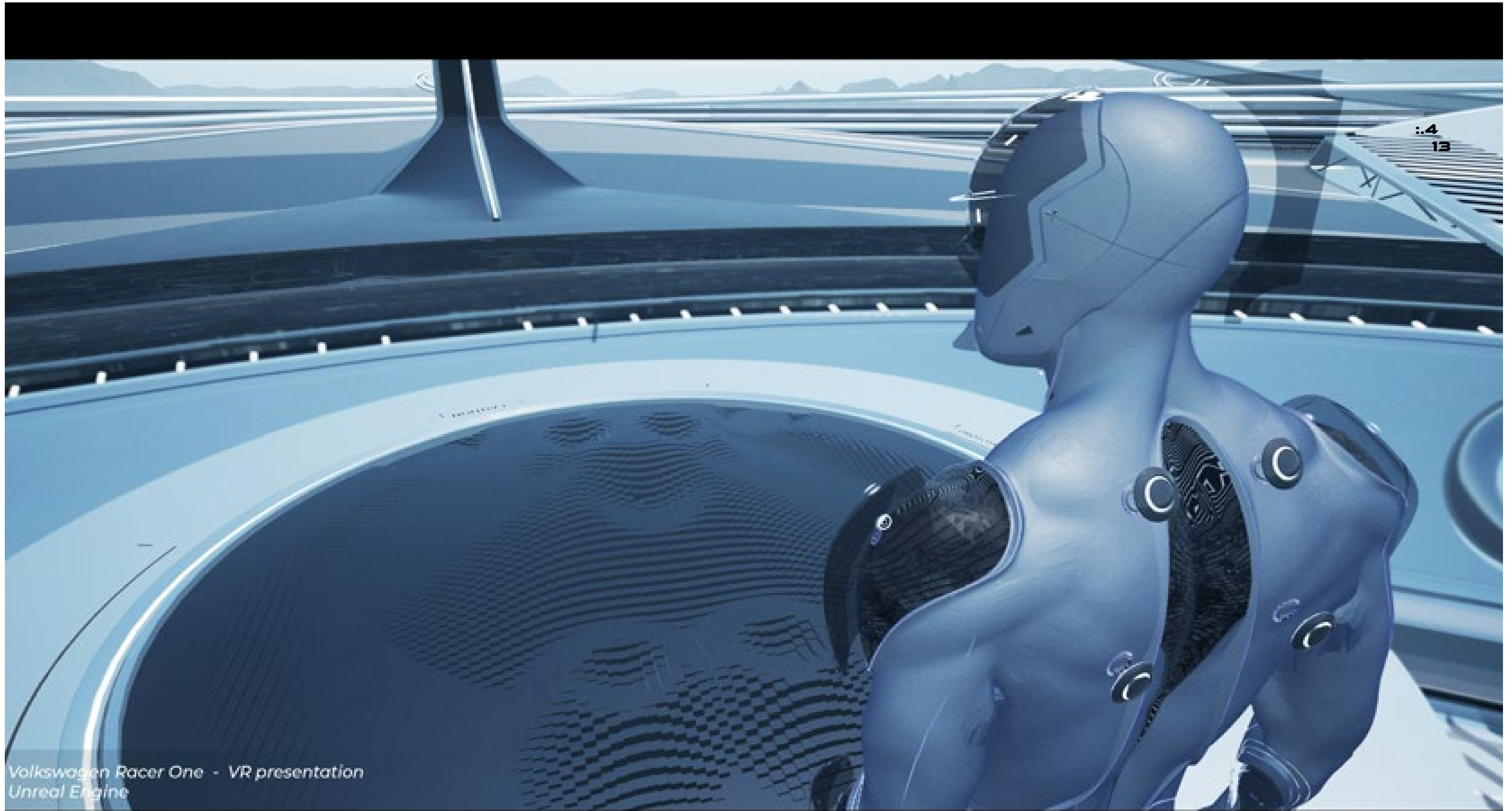




Volkswagen Racer One - VR presentation  
Unreal Engine



Volkswagen Racer One Racing Track - VR presentation  
Unreal Engine



4  
13

Volkswagen Racer One - VR presentation  
Unreal Engine



:4  
14

Volkswagen Racer One Racing Hangar - VR presentation  
Unreal Engine

# AI INSPIRATION EXTERIOR

Midjourney



- Divided mechanical structure, light core, emissive surface, Technologic utopia, Formula one in space -

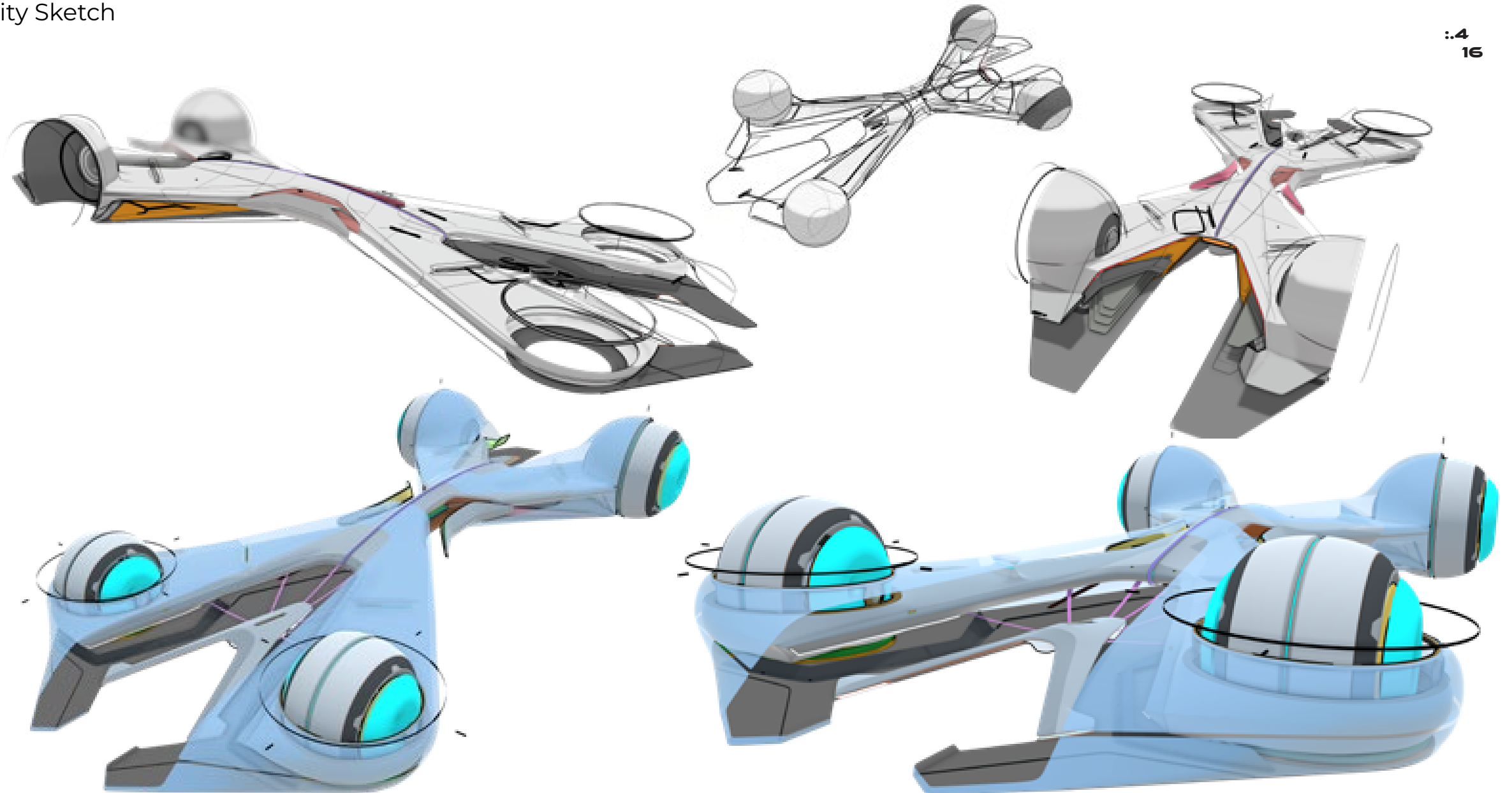
Digital + Physical structure /  
Vehicle Spinal-Cord /  
Dual Separated Body /  
Energy Dynamic Core /  
"Alive" Mechanism /  
Digital Accent /



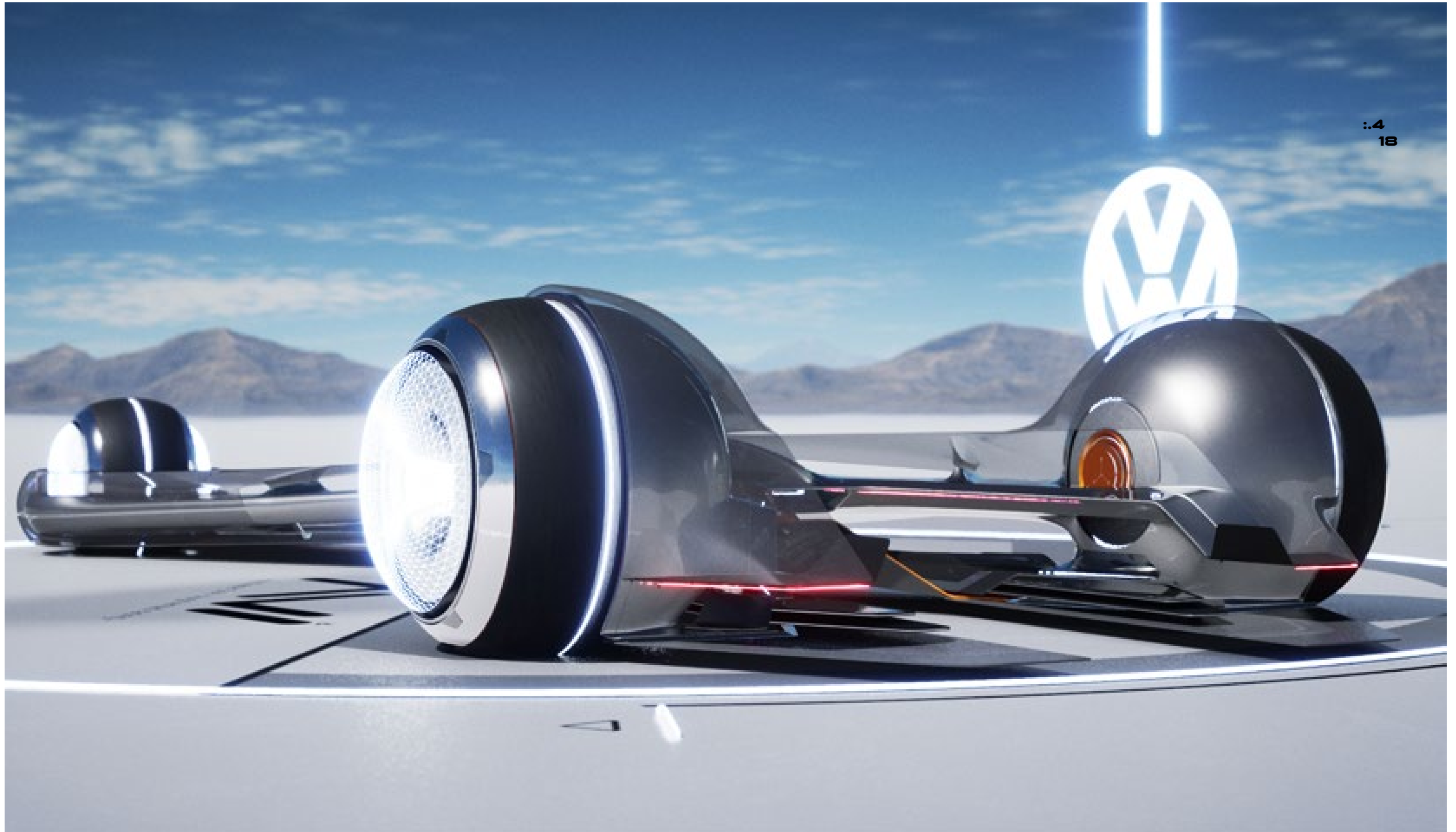
# RACING MODULE 3D <sup>VR</sup>

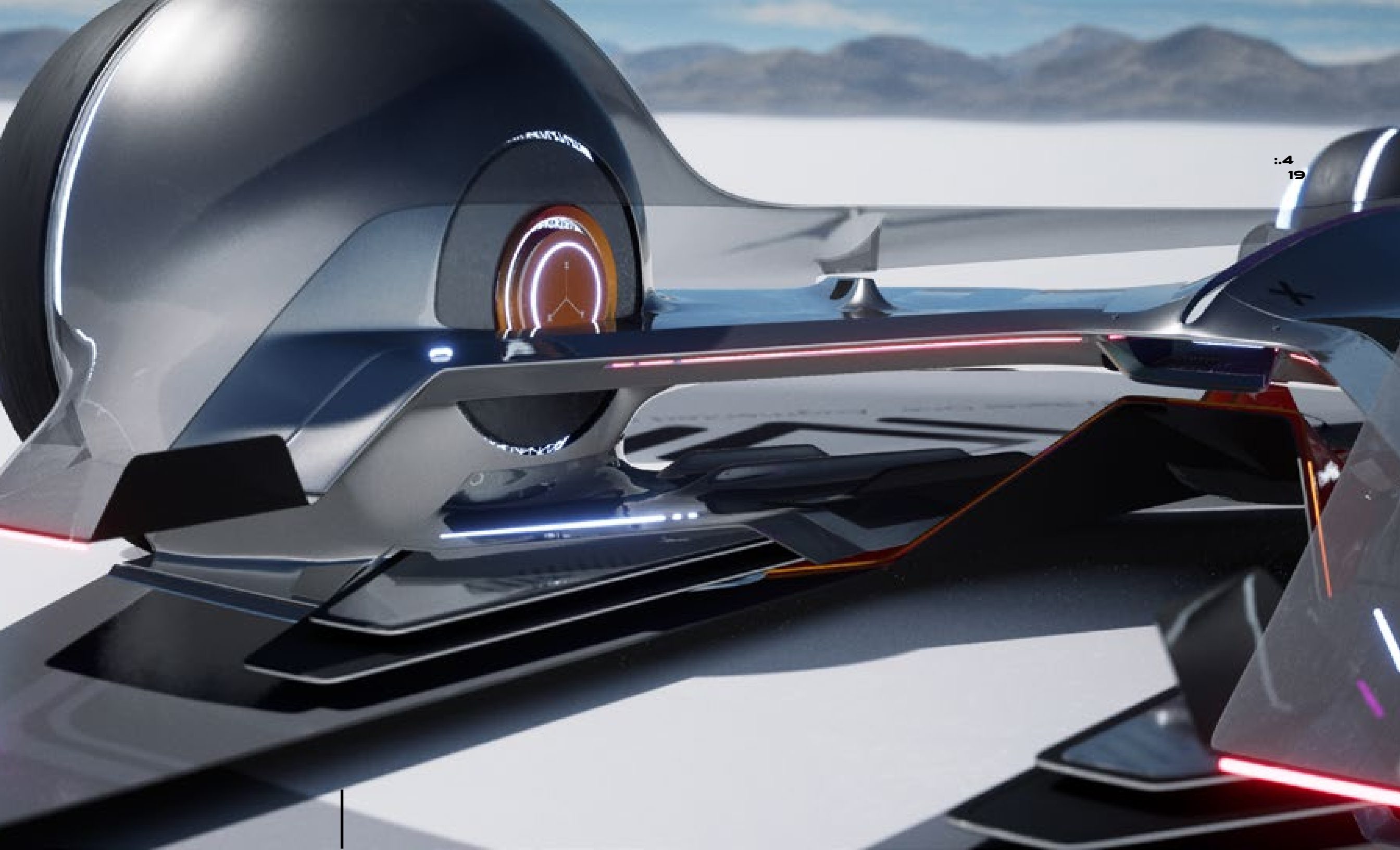
Gravity Sketch

4  
16









4  
19

*Pilot Psychological Status*

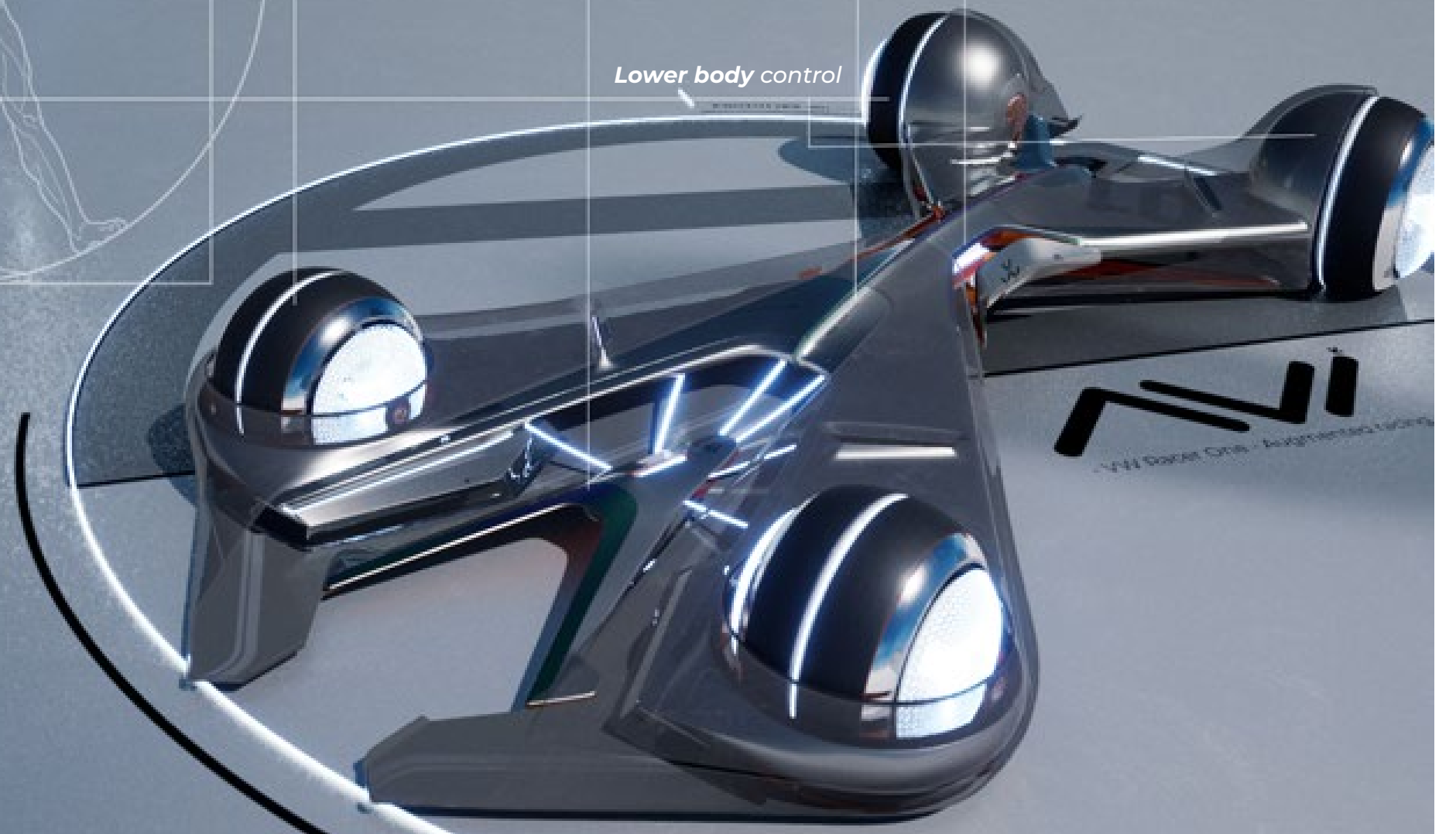
*Upper body control*

*Pilot Heartbeat*

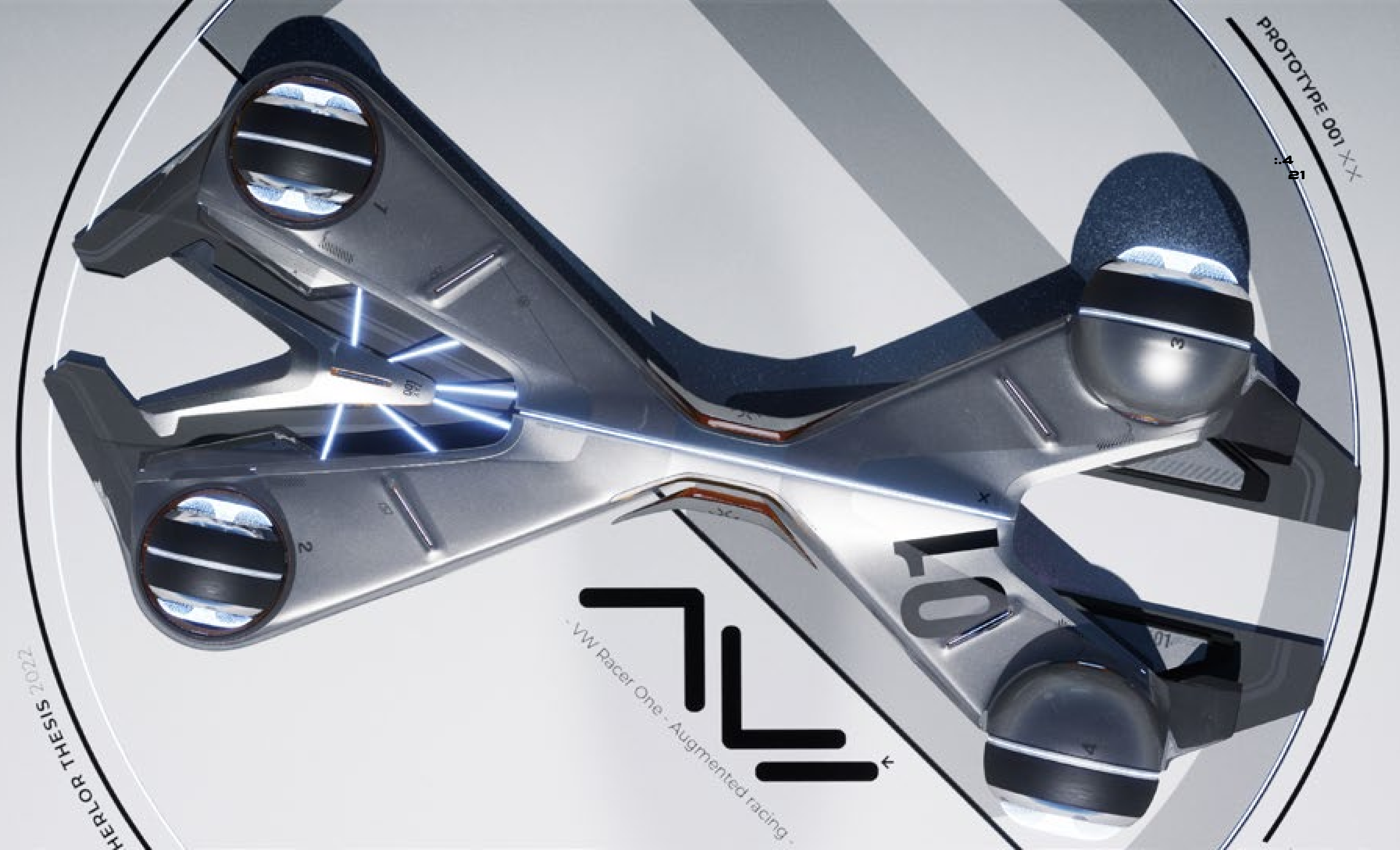
*Moving Spinal Cord*

*Lower body control*

*4  
20*







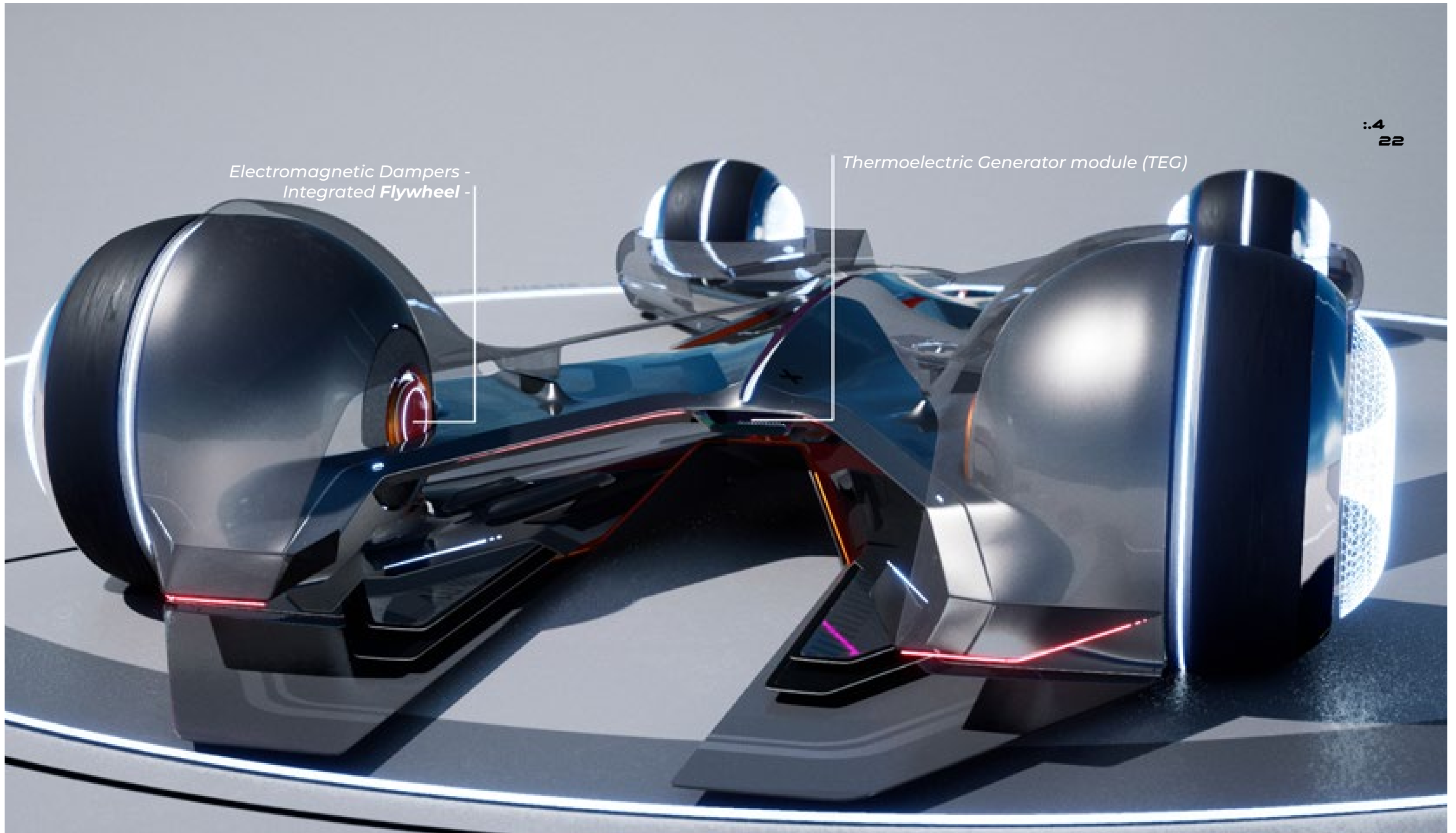
PROTOTYPE 001 ++

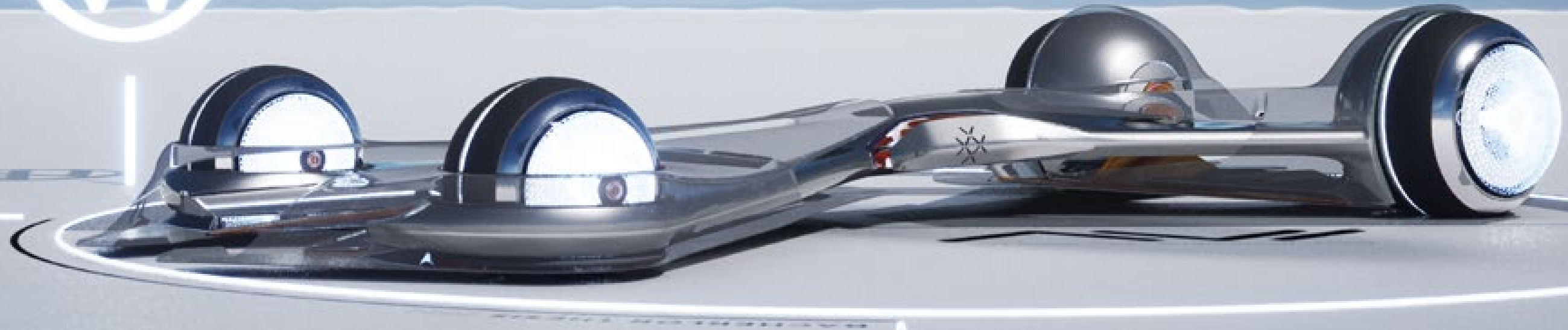
HERLOR THESIS 2007

- VW Pacer One - Augmented racing -

*Electromagnetic Dampers -  
Integrated Flywheel -*

*Thermoelectric Generator module (TEG)*







Energy harvesting Wheel **50% Physical** - Surface friction  
**50% Digital** - Racetrack energy

Metamaterial vehicle exoskeleton



- VW Racer One - Augmented racing

:.4  
25



- VW Racer One - Augmented racing -