Koenigsegg Variera

Maximilian Tyrot

BA degree project 2025.

LUND UNIVERSITY

TITLE PAGE

Koenigsegg Variera
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Degree project for bachelor of fine arts in design.
Main field of study Industrial Design
From Lund University school of Industrial Design, Department of Design Sciences
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Other contributors: Oscar Dülow
Printed 2025

PROJECT DURATION: 13 WEEKS

RESEARCH

BRIEF

DESIGN PROCESS

3D-PRINTING/ FINALIZING

PRESENTATION

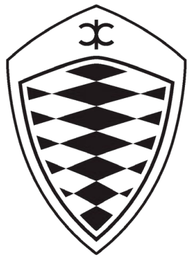
ABSTRACT

The Koenigsegg Variera represents a bold new interpretation of everyday performance, fusing the brand's uncompromising engineering ethos with a visionary approach to electric mobility. Conceived as a dual-purpose vehicle, the Variera seamlessly transitions between autonomous driving and Koenigsegg's established performance driving, capturing the essence of Koenigsegg's performance spirit. Designed from the ground up with a lightweight, carbon-intensive architecture and flush aerodynamic surfaces, the Koenigsegg Variera brings megacar-level innovation into a more compact, user-focused platform.

Its proportions, assertive yet approachable, combine minimalistic form language with functional aero, enhanced by an electric powertrain centered around Koenigsegg's own Terrier e-motor and a low-profile skateboard battery solution.

BREIF

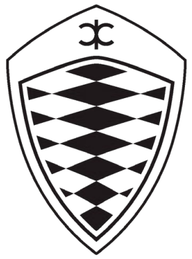
Develop a design for an electric Koenigsegg for the commuter car segment as well as the performance segment for a new entery customer base.



MOTIVATION

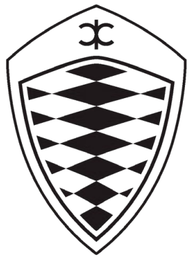
The motivation behind the project is pretty simple.

I want to become a car designer in the future and this was my chance to have an entire project where I could work and explore something that I have a passion for.
And I got the oppritunity to have a collaboration with one of the coolest car brands in the world. That being Koenigsegg.



BACKGROUND

The background for this project, besides me wanting to become a car designer and more about how I landed on making a commuter/sports car hybrid, came from my first visit to the Koenigsegg factory. There, after talking about my initial idea of an electric hypercar and coming to find out that Koenigsegg's customers didn't really want that but rather wanted the chance to design something entirely new, sounded super intriguing.
It also made more sense in both not using this collaboration to design a car that no customer would want and to challenge myself to design a Koenigsegg like no other before.



PROJECT PARTNER

For my bachelor's project I collaborated with the Swedish automotive manufacturer Koenigsegg. Where I was guided by a former LTH student named Oscar Dülow who is a design at Koenigsegg.

THE BRAND

“Koenigsegg is a Swedish avnate-garde megarcar and innovative technology company. A record breaking tradition courses through our history - the result of pushing the boundaries of automotive technology to achive higher standards in ultimate performance.“

Koenigseggs Mission

To create the perfect car with no compromises, no limits and no fear of failure.

Koenigseggs philosophy

To not tolerate compromise.
Rather, we work with innovation in order to avoid compromise completely. Nothing is impossible.

1994
Koenigsegg Automotive
is born.

2000
The first production prototype is shown
at the Paris motor show.

2002
The first road car
Koenigsegg CC8S.

2003
There goes the factory...

2004
The Konigsegg CCR was an evolution of
the CC8S. There were 14 produced in
total.

2006
Koenigsegg CCX, the CCRs evolution.
The CCXR was Koenigseggs first “green”
supercar.

2015
Koenigsegg Regera,
Konigseggs first hybrid. And luxury meg-
acar.

2022
Koenigsegg CC850
Inspired by the Koenigsegg CC8S. With
both a automatic and manual gearbox.

2010
Koenigsegg Agera
moving the brand
forward into bold new territory.

2019
Koenigsegg Jesko Attack
Konigseggs track-focused, road-legal car
for those seeking the ultimate in
performance.

2023
Koenigsegg Gemera
The world's first Mega-GT and
Koenigsegg's first four-seater.

Whats next???

THE SHOW MUST GO ON

RESEARCH

COMMUTING HISTORY

Commuting is periodically recurring travel between a place of residence and a place of work or study, where the traveler, referred to as a commuter, leaves the boundary of their home community. The first major separation from the workplace and home was with the invention of steam railroads in 1804. This is also when the people who traveled came to be called commuters, which was derived from the early days of rail travel in the US.

However, before the 19th century, most workers lived closer to their place of work, as the most common way to commute then was by foot, so the distance was the main factor of accessibility. When the Industrial Revolution took place, it also changed the way commuting worked. An example of this is the Industrial Revolution relocated most paid work from typical households and rural areas to factories in urban areas and cities, closing the distance between work and home in urban areas, which made the commute from rural areas to the workplace inefficient. Hence, a lot of people moved to the newer urban areas. The distance from point A to B is the biggest factor which affects commuters, and as transportation technology and speed improved, more ways to commute started emerging. In 1994, Cesare Marchetti, an Italian physicist, described an idea that has come to be known as the Marchetti Constant.

In general, he declared that people have always been willing to commute for about a half-hour, one way, from their homes each day. This principle has profound implications for urban life. The value of land is governed by its accessibility—which is to say by the reasonable speed of transport to reach it. The history of commuting can be simplified as follows: “The shape of cities has been defined by the technologies that allow commuters to get to work in about 30 minutes.” - Bloomberg, The Commuting Principle That Shaped Urban History, 2019. In its most basic form, commuting is the ability to reach places in an urban environment in the easiest and most efficient way possible, which in turn transforms the urban environment. This means that the physical size of cities is a function of the speed of the transportation technologies. Since the steam railroads were the first major separation and the start to commuting as we know it today, and since then, more commuting options have become available, like public transports such as buses, trains, bikes, and the most common being cars.

COMMUTING RESEARCH

Commuting on a global scale is currently mainly done by car. This can be simply attributed to 'The value of land is governed by its accessibility' - Cesare Marchetti. This is why the car has been and continues to be the main mode of transportation for most commuters and people in general, since you automatically gain access to most places which you might not with, for example, public transport, or at least not as easily. From the research, I obtained a percentage of the number of people who use their personal car compared to public transport, etc., in the countries where the Variera would or could be sold

Markets form of transportation statistics for commuting

USA

Personal car - **75%**

Public transport - **12%**

Self service shared vehicle - **13%**

Germany

Personal car - **64%**

Public transport - **27%**

Self service shared vehicle - **6%**

China

Personal car - **64%**

Public transport - **21%**

Self service shared vehicle - **23%**

Sweden

Personal car - **51%**

Public transport - **33%**

Self service shared vehicle - **3%**

Daily commute statistics from the U.S from December 2024

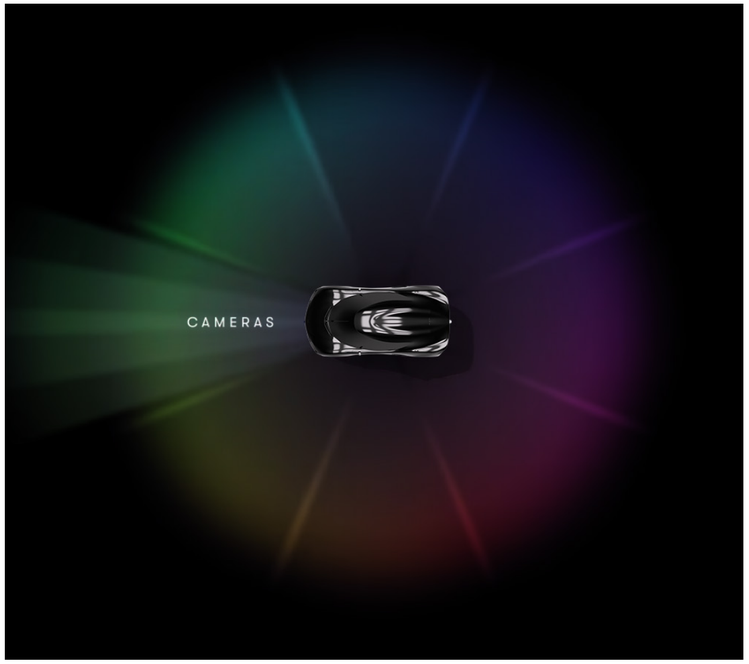
These times were used to get a base line understanding of the commute duration on a daily basis.

Less than 15 minutes - **22%**

15 to 29 minutes - **29%**

30 to 59 minutes - **18%**

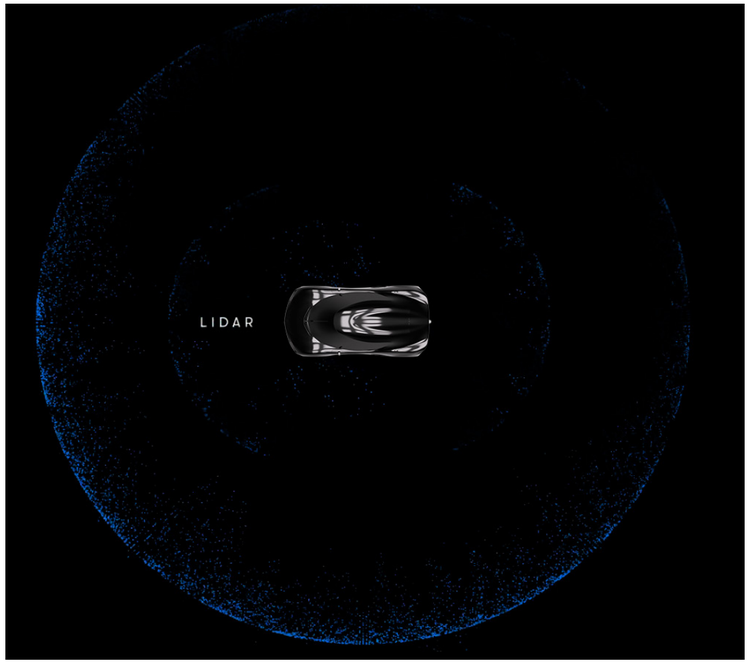
60 to 119 minutes - **4%**



Camera System

The Koenigsegg Variera's safety and autonomous driving capabilities rely on a sophisticated multi-system architecture. One of the core components is its advanced camera system, which provides a full 360° view of the vehicle's surroundings. These high-resolution cameras operate effectively in both daylight and low-light conditions, enabling the vehicle to interpret complex environments such as construction zones, urban intersections, and dynamic traffic scenarios.

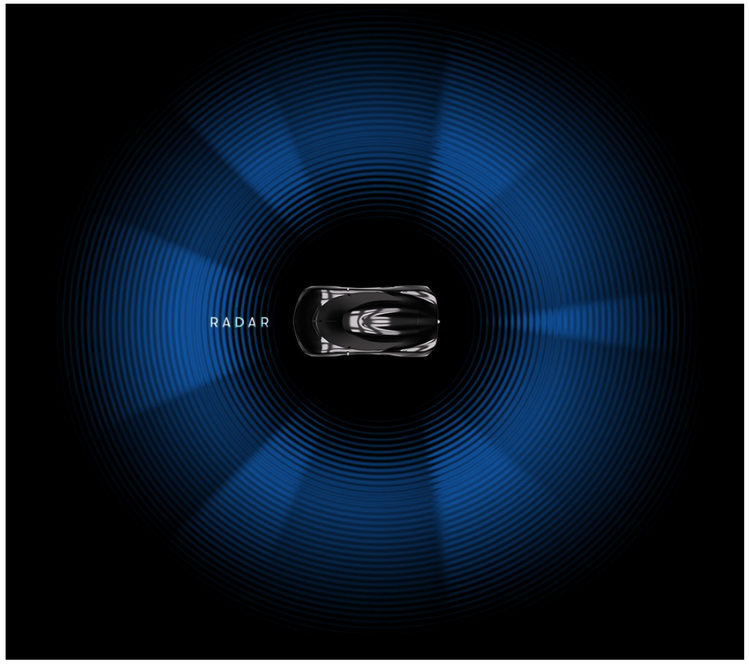
In automotive applications, camera systems are typically mounted around the car (front grille, side mirrors, rear bumper, windshield, etc.) to capture a wide field of view. The visual data collected is processed in real-time using computer vision algorithms to detect objects (cars, pedestrians, signs, etc.), identify lane markings, read traffic signals, and assess road conditions. This information is essential for enabling functions like lane keeping, adaptive cruise control, emergency braking, and full autonomous navigation. The camera system works in tandem with radar, LiDAR, and AI-based decision-making units to create a comprehensive perception of the driving environment, allowing the Variera to make safe, real-time decisions.



LiDAR System

The second core component of the Koenigsegg Variera's self-driving and safety architecture is its LiDAR (Light Detection and Ranging) system. This system creates a precise 3D map of the vehicle's surroundings by emitting rapid pulses of laser light in all directions using strategically placed sensors on the vehicle's exterior. These laser pulses bounce off surrounding objects, and the time it takes for the light to return is used to accurately calculate the distance, shape, and size of those objects.

In automotive applications, LiDAR is crucial for depth perception. It provides high-resolution spatial data that allows the Variera to detect and track nearby vehicles, pedestrians, lane boundaries, road edges, curbs, and even small or partially obscured objects—regardless of lighting conditions. By combining this 3D spatial information with data from the vehicle's camera system, the Variera builds a detailed and context-aware model of the environment. This fusion enables the vehicle to navigate safely and precisely through both simple and highly complex environments, including urban areas. LiDAR complements cameras by adding depth and range accuracy, especially in situations where visual data alone may be insufficient due to lighting, glare, or occlusions



Radar System

The third core element of the Koenigsegg Variera's advanced self-driving suite is its radar system. Radar (Radio Detection and Ranging) sensors emit radio waves that bounce off objects in the environment. By measuring the time delay and frequency shift (Doppler effect) of the returning signal, the system accurately determines both the distance and relative speed of surrounding objects.

In automotive applications, radar is especially valuable for real-time object tracking, including vehicles, cyclists, and pedestrians. Unlike cameras and LiDAR, radar is highly effective in adverse weather conditions such as rain, fog, snow, or dust, where visibility or optical clarity may be compromised. This makes radar an essential component for maintaining safety and situational awareness in poor driving environments. The radar system works in coordination with the Variera's cameras and LiDAR, cross-verifying object detection and enhancing the accuracy of speed and motion prediction. This layered sensing approach ensures that the Variera can make fast, informed decisions for functions like adaptive cruise control, collision avoidance, blind spot monitoring, and complex urban navigation

This is Mat and Emelia, 26-year-old long-time lovers of cars and performance who live and breathe the car enthusiast's lifestyle.

Growing up with social media, they were exposed to the automotive and performance world at a young age, sparking a passion that has shaped their lives ever since. From late-night garage builds with friends to full-on car businesses, both Mat and Emelia have built careers around modifying, tuning, racing, and sharing their love for cars.

Their motivation? Doing what they love and one day being able to own and drive the cars from the manufacturers they grew up seeing on social media.

Since they were young, hypercars have represented the ultimate goal. Koenigsegg, the hypercar producer from Sweden of all places, became the dream to own one, eventually to be their crown jewel of the collection. But like many enthusiasts, top-tier Koenigseggs felt just out of reach for now.

So when rumors started that Koenigsegg was developing a fully electric performance commuter, something that could be both a daily driver and a weekend thrill ride, while still delivering the unmistakable Koenigsegg experience, everything changed.

This is their entry point. Their moment.

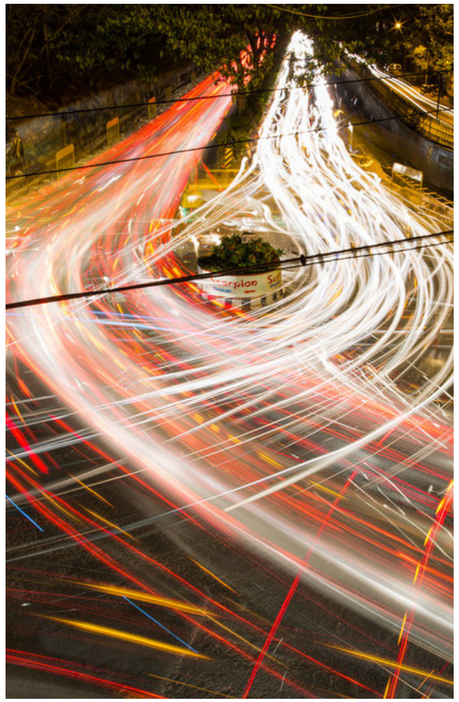
Mat and Emelia are now new hatchlings, stepping into the Koenigsegg world for the first time, joining the 'egg' family with a car that fits both their lifestyle and their passion. This isn't just their first Koenigsegg; it's a symbol of how far they've come and how much further they plan to go.

COMMUTING TO THE BUISNESS

MANAGING AND WORKING IN THE SHOP

AFTER WORK WORKOUT

SIM RACING



AUTOMOTIVE EVENTS

CONVOY RUNS WITH FRIENDS

FUN AT THE TRACK

RELAXING AND TALKING CARS

MARKET POSITION

Koenigsegg Variera intended market position

Koenigseggs current market position

Mass market

Vehicles designed for the general population, focusing on affordability, fuel efficiency, reliability, and practicality. They are produced in large volumes by mainstream brands.

Sports car market

Cars engineered for spirited driving, emphasizing acceleration, handling, and design. They are usually two-door coupes or convertibles, often rear-wheel drive.

Luxury car market

Premium vehicles offering superior comfort, advanced technology, refined materials, and brand prestige. They are targeted at consumers seeking status and a high-end driving experience.

Super car market

High-performance, exotic vehicles with striking designs, powerful engines, and advanced aerodynamics. They are typically produced in lower quantities.

Hyper car market

Hypercars are the pinnacle of automotive engineering. They are ultra-rare, ultra-expensive, and capable of extreme performance, representing the cutting edge of technology and performance.

DESIGN PROCESS

WHAT MAKE A KOENIGSEGG

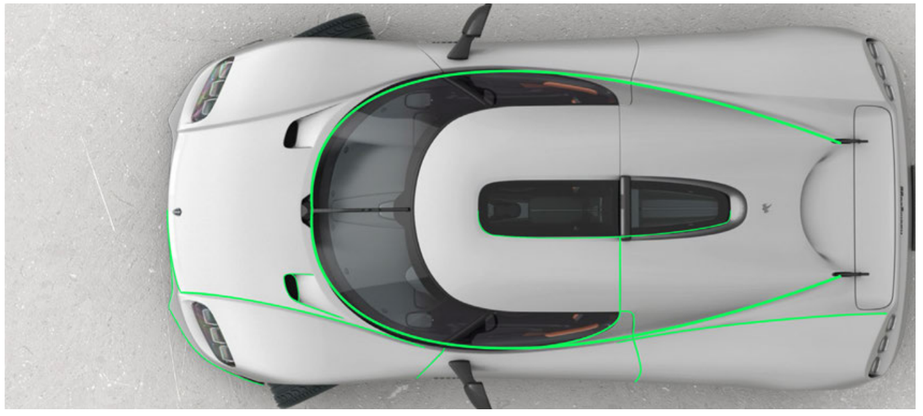
What makes a Koenigsegg a Koenigsegg comes from the brand's mission: to create the perfect car with no compromises, no limits, and no fear of failure.
Koenigsegg's philosophy is to not tolerate compromise. Instead, they work with innovation in order to avoid compromise completely. Nothing is impossible.

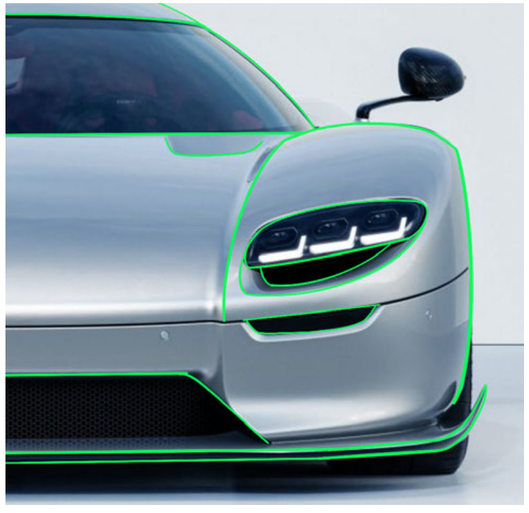
It starts with the design, which is sleek, purposeful, and aerodynamically obsessive. Koenigsegg's design language is defined by organic surfaces that channel the air as efficiently as possible. Every line has a job to do; every intake is a direct response to airflow demands, and every panel is crafted from exposed carbon fiber, a material as functional as it is beautiful. Koenigsegg's journey to make the perfect car for their segment stems from how their design is dictated by their cars' extreme performance. They achieve this by investing heavily in developing their in-house expertise and facilities to reach their intended goals set by both the brand and the megacar segment. With every Koenigsegg manufactured to be the best for its intended segment, built with in-house components to ensure that every part of the car, from the technical components you never see to the technical yet beautiful carbon fiber shell surrounding it, works to deliver the best experience for the customer.
The models I analyzed to understand Koenigsegg's design language were the Koenigsegg CC850, Gemera, and Jesko. By looking at what these separate models have in common, I aimed to create the look of a Koenigsegg that stands out against their competitors and then use it to create my own design theme for the Koenigsegg Variera.

KOENIGSEGG DESIGN ANALYSIS CC850

The CC850: A modern reinterpretation of the original CC8S from 2002, it has a clean, minimalistic yet organic shape with smooth lines flowing across it. The only major changes to the organic surface are the air intakes, cutlines, and carbon fiber aerodynamics surrounding the lower body, helping it maintain a low stance.

From my analysis, the most striking design element of the CC850 is its greenhouse, especially from the side view. The windshield extends far forward, giving it a jet-fighter cockpit look. From the top, the forward-sloping windshield emphasizes width and wraparound visibility, while the overall teardrop shape starts wide at the front and tapers towards the rear. A signature Koenigsegg feature is its double-bubble roof with an inset surface and a central window. Small air outlets in front of the windshield further refine the aerodynamics. From the side, the car has a shorter rear overhang compared to the front, while the organic surface is only broken up with clean and minimal distinct panel cutlines. The upward swoop into the window line is a classic Koenigsegg trait, complemented by a uniquely shaped air intake with a soft sculpted look, almost as if carved out with an ice cream scoop. At the front and rear, the design accentuates the car's wide hips, creating a balanced and powerful stance. The headlights blend soft curves with sharp angles, integrating the surrounding surfaces with air intakes. The lower portion, made of exposed carbon fiber, forms the front splitter, side skirts, and rear diffuser, enhancing aerodynamics and downforce. In the rear, the bodywork curves inward around the rear wheels, exposing more of them for a dynamic effect.

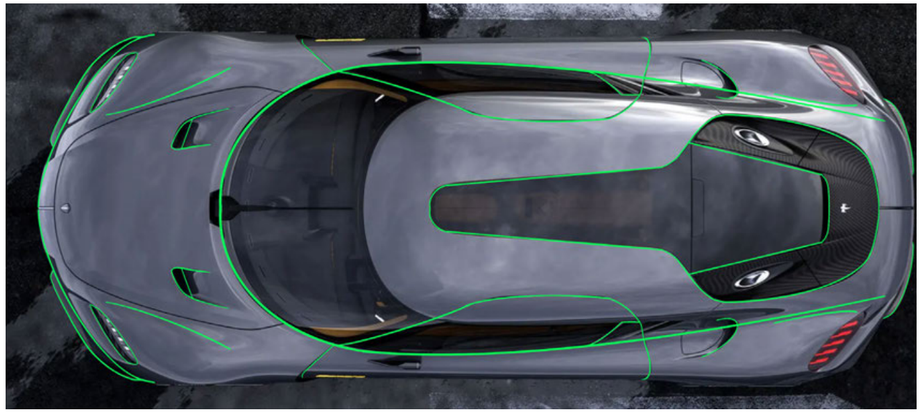


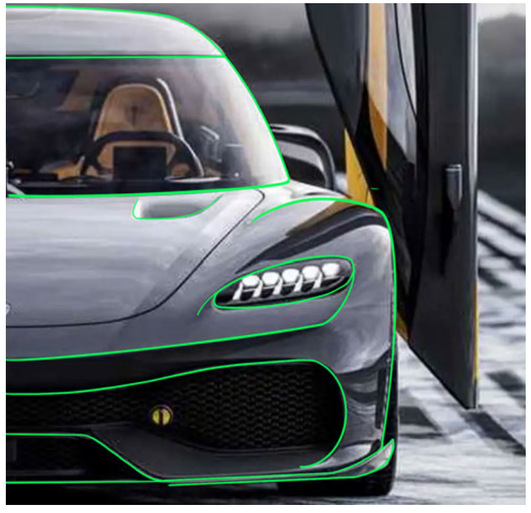


KOENIGSEGG DESIGN ANALYSIS GEMERA

The Gemera: The world's first Mega-GT blends Koenigsegg's hypercar DNA with the practicality of a grand tourer. Being Koenigsegg's first four-seater, it stretches the known Koenigsegg design language and silhouette while still maintaining a hypercar design with the help of perfected packaging and design elements to give the Gemera a refined yet powerful design.

Like the CC850, the Gemera's most dominant design element is its greenhouse. As Koenigsegg's first four-seater, its design language has been stretched, making the greenhouse feel even more like a fighter jet cockpit. The forward-sloping windshield emphasizes width and wraparound visibility, even more so than on the CC850. The roof window element reappears, merging seamlessly with the rear window and the carbon fiber exhaust area. Vents in front of the windshield reappear with a similar placement and shape, while on the rear hips, more vents appear in a similar shape. From the top view, the hips are subtly highlighted, while the side profile features a more balanced overhang. The large air inlets and outlets are more pronounced, adding definition. The upward swoop of the window line and the integrated side air intake, both classic Koenigsegg traits, are present but more discreet. The headlights and taillights follow a softer shape with sharp angles, and the surrounding surfaces are sculpted to highlight them. Compared to the CC850, the aerodynamic elements like the front splitter, side skirts, and rear diffuser are more prominent, enhancing the aggressive GT character of the Gemera. This contrast between the smooth organic bodywork and the technical aerodynamic features creates a striking visual balance. Large air openings at the front and rear give the car a lighter and more open appearance from a distance, especially at the rear, where they reduce visual mass. The Gemera follows the element of the rear bodywork curving inwards, exposing more of the wheels for a dynamic stance.

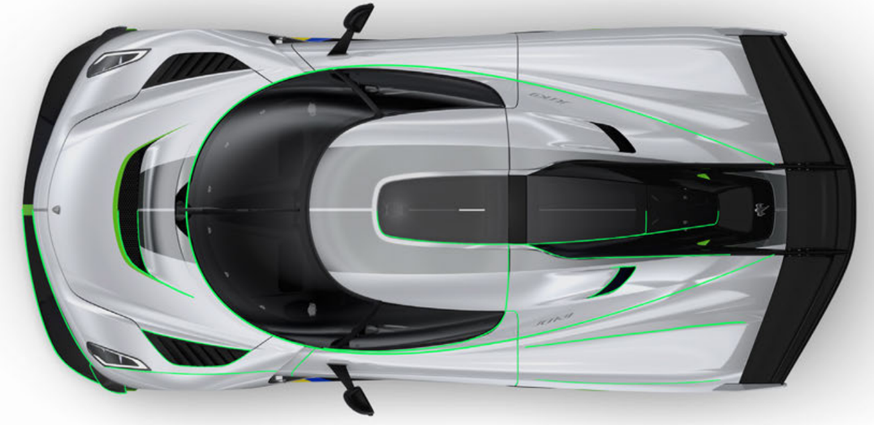




KOENIGSEGG DESIGN ANALYSIS JESKO

The Jesko: The ultimate track weapon from Koenigsegg, with an even more focused design on handling and track performance, delivered from the Jesko's extreme aero focus, visible from its aero packaging and its massive rear wing. This helps the Jesko maintain downforce while being pushed to its limit on the track, all while still maintaining a beautiful and organic shape.

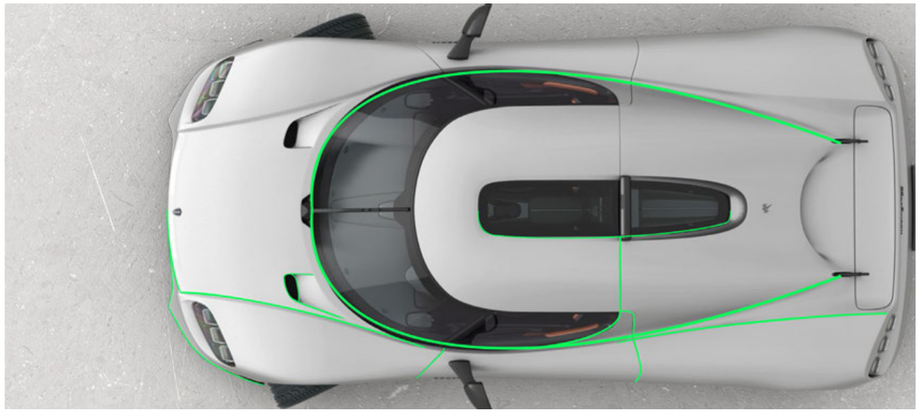
The Jesko follows Koenigsegg's signature greenhouse silhouette and teardrop shape, but its most striking difference from the CC850 and Gemera is its massive rear wing, designed for generating downforce. As a track-focused hypercar, the Jesko's aerodynamics are far more aggressive and visually dominant. From the top, the vent placement differs, and a larger central vent for airflow can be spotted. The hips are tightly sculpted, giving the body a wind-sculpted, muscular appearance while still being subtle, similar to the Gemera. From the side, the upward swoop of the window line and the side air intake remain key design traits. The intake's integration falls between the CC850's deep sculpting and the Gemera's more discreet approach, enhanced by a carbon fiber wing for both function and aesthetics. The overhang is balanced, but the extended front splitter and canards push forward, maximizing track performance. Carbon fiber elements wrap around the lower body, seamlessly integrating into the front intakes. The contrast between exposed carbon and body-colored sections adds visual lightness. The headlights have shifted from a horizontal to a vertical orientation with a more technical and less organic shape. At the rear, visual lightness is achieved through the bodywork wrapping around the exhaust and diffuser, while inward-curving bodywork exposes the rear wheels, reinforcing a now-established Koenigsegg design element.
The taillight design is highlighted by an inset surrounding surface, adding depth and refinement.



KOENIGSEGG DESIGN ANALYSIS RESULTS

The results from analyzing the CC850, Gemera, and Jesko reveal the core design elements that define a Koenigsegg. The brand's design language is sleek, purposeful, and aerodynamically focused. Signature features include the fighter jet-inspired greenhouse with its teardrop shape, the upward swoop of the window line and side intakes, and the integration of front and rear air intakes and outlets. It will be interesting to see how these elements translate to the electric Variera. Aerodynamic components like front splitters, side skirts, rear diffusers, and wings are crucial but may need to be toned down for a commuter-performance car while maintaining the balance between the organic body and technical aero elements. Another key theme is the concept of visual lightness, using design to create an open, lightweight appearance while retaining functionality.

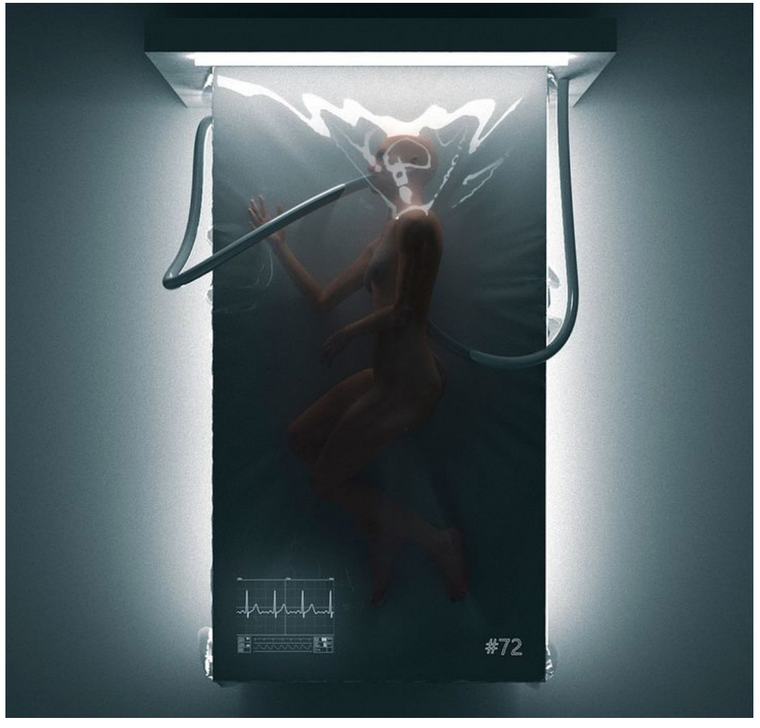
The key takeaways from the analysis are the fighter jet-inspired greenhouse and teardrop silhouette, organic yet aerodynamic bodywork, and additive aero elements.
Moving forward, I will explore how to incorporate these principles while developing a design theme of my own

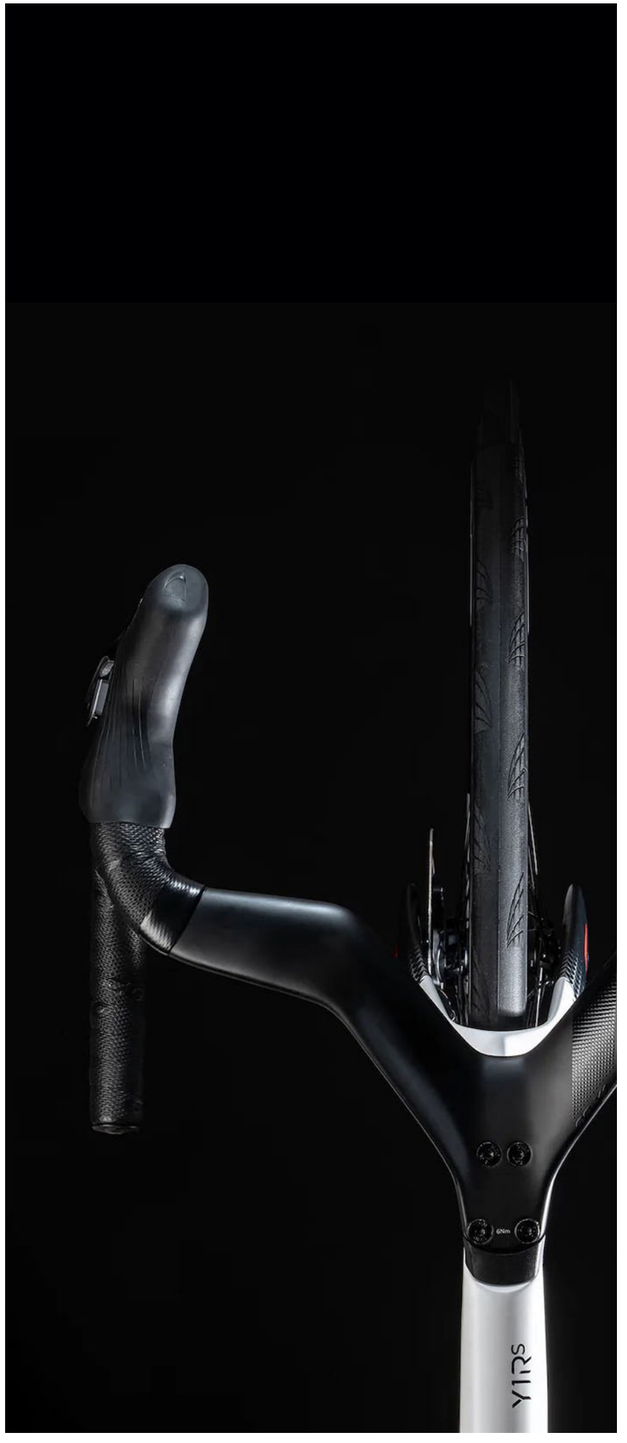


ORGANIC

SHRINKWRAPPED

ADDITIVE



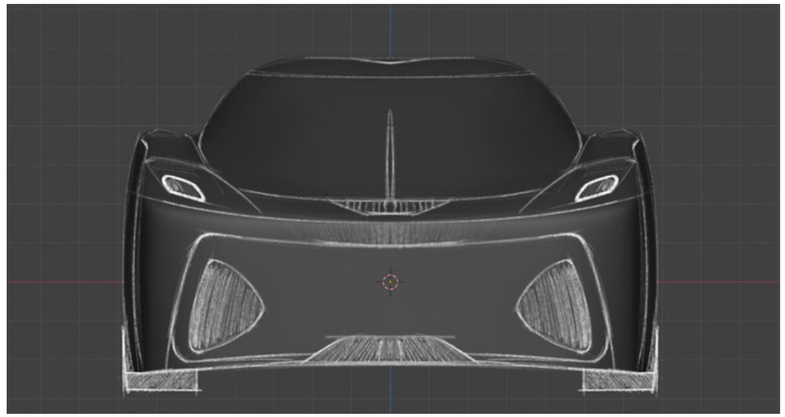
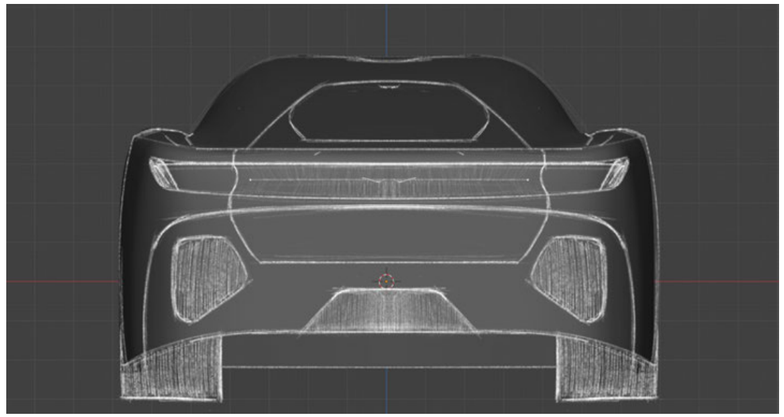
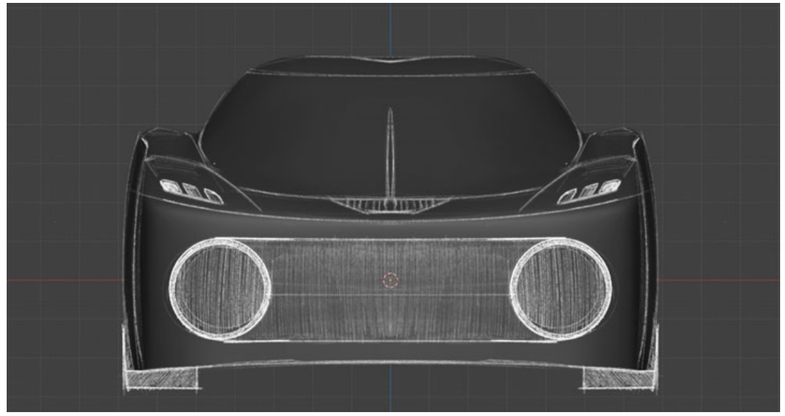
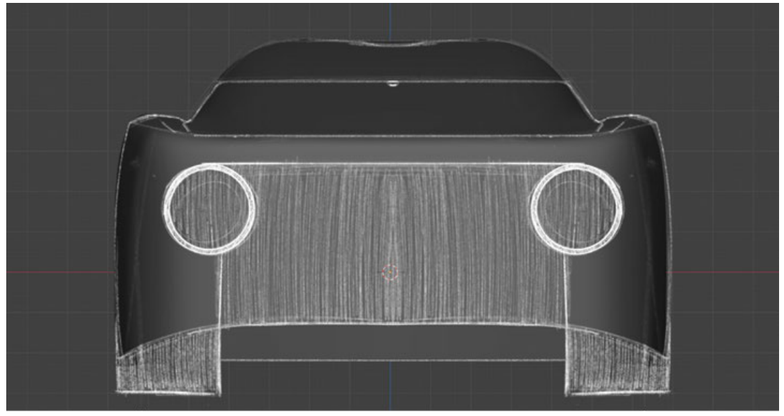
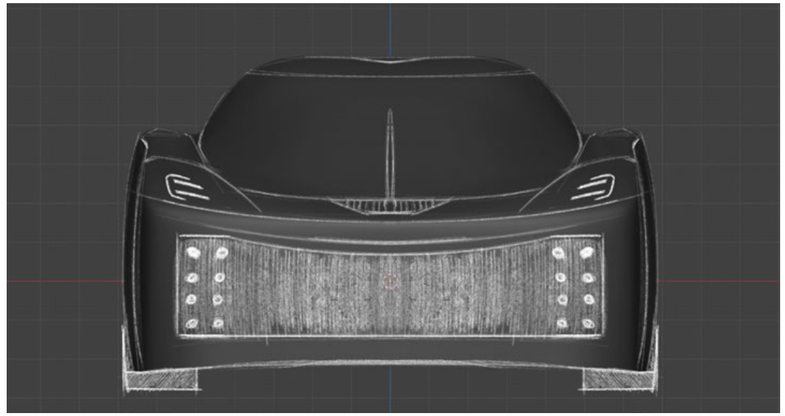
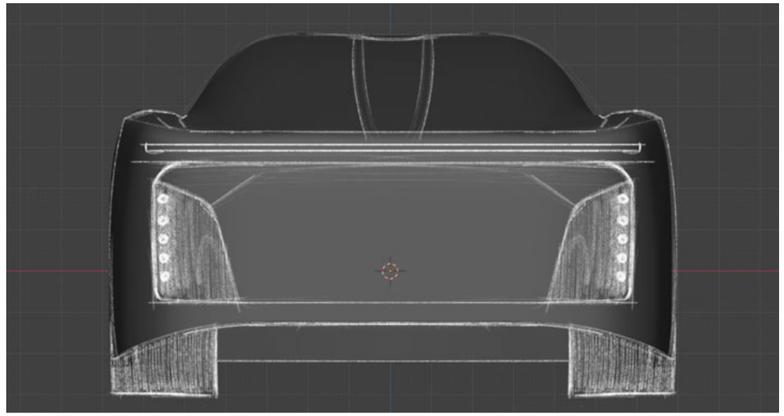


SKETCHING AND SKETCHING

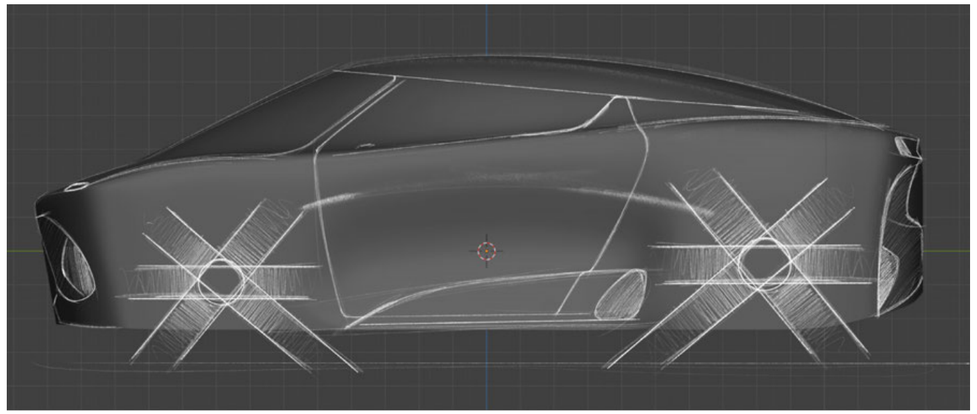
Once I had analyzed Koenigsegg's current design language and created a design theme for the Variera, I started doing some fast brainstorming sketches to quickly visualize the basic idea of the design. The design process consisted of BIC pen sketches, Procreate sketches, and a nice mix of the two.

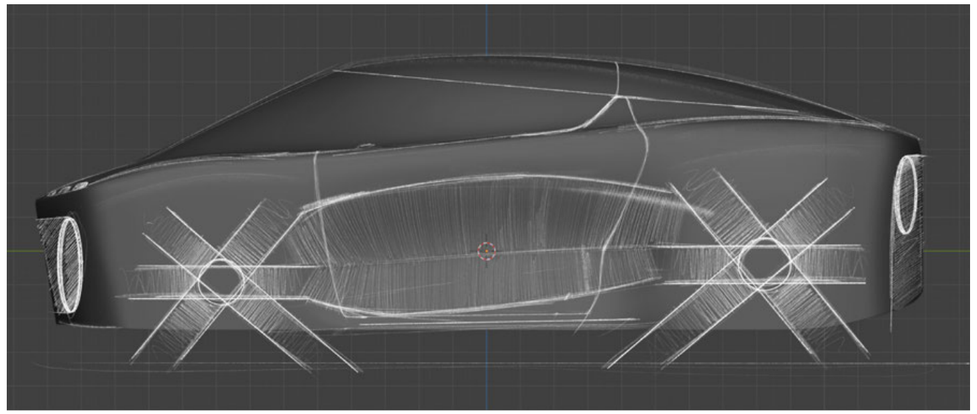
DESIGN DEVELOPMENT

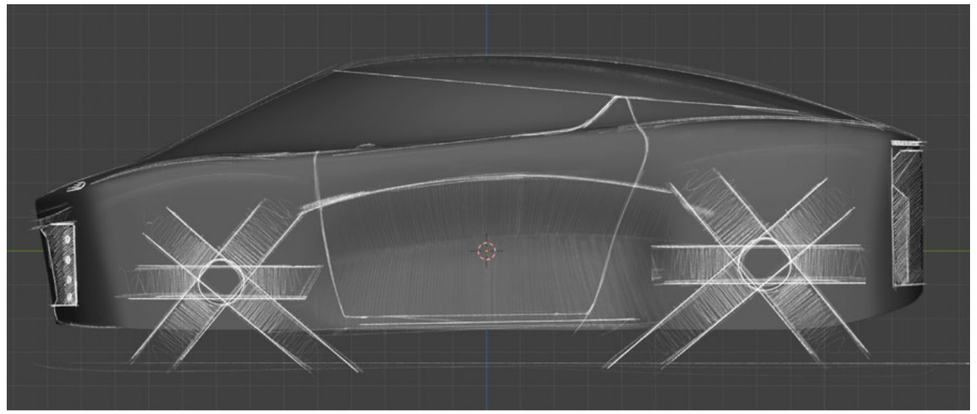
The process started with doing loose sketches from the main views. I decided to do three versions so I had more options to choose and combine from, and to have more material to get feedback on. For these sketches, I made a basic 3D model in Blender based on the basic side view sketch I did when brainstorming, then I imported the images into Procreate.

DESIGN DEVELOPMENT







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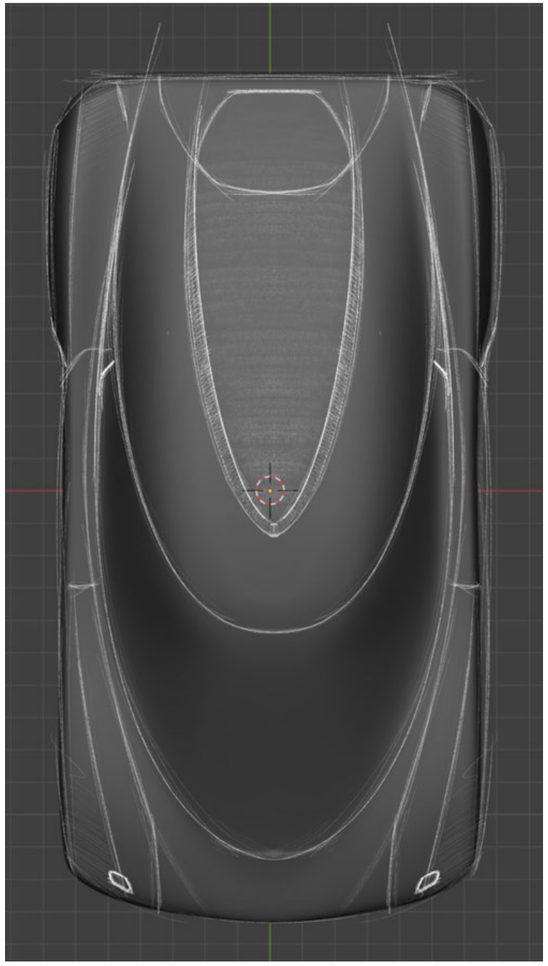
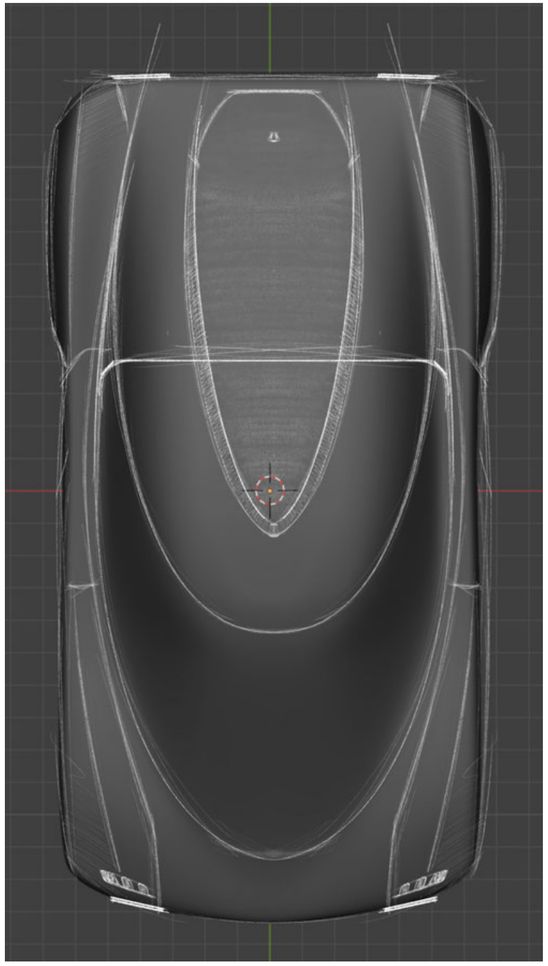
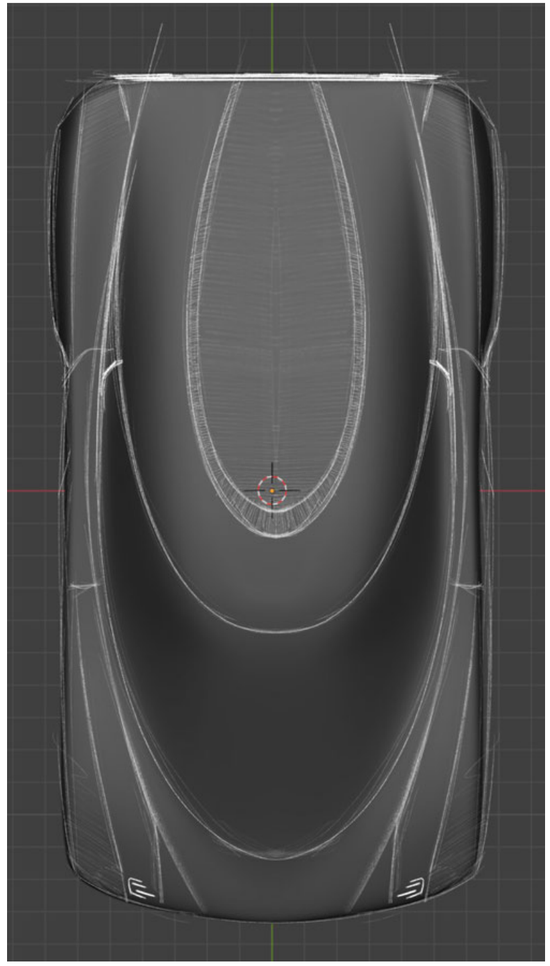






Koenigsegg
Variera

DEVELOPMENT FEEDBACK

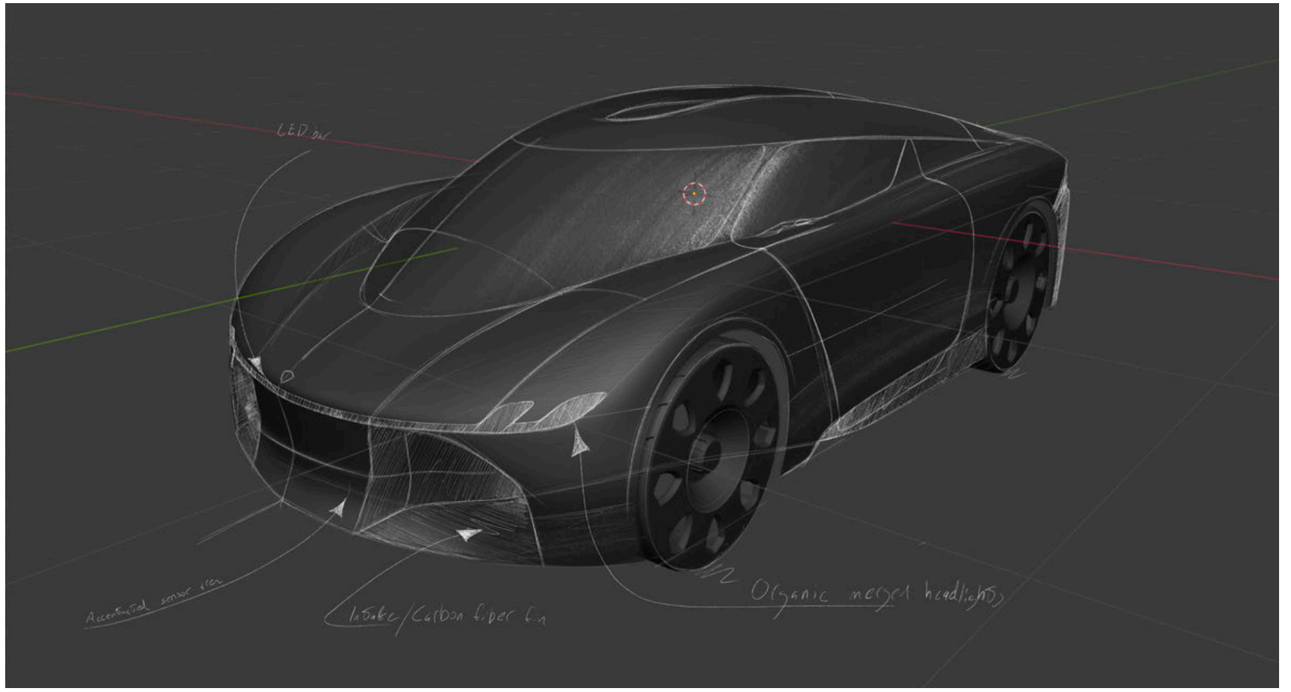
Once I had done the base views of the three versions and a hero sketch on the version I liked the most, I got feedback both from my supervisor and Koenigsegg on what to do next, but also what to consider changing with the design to make it fit the Koenigsegg family more while still finding new ground to explore my design language.

The feedback mainly consisted of the following:

Light element size:
Front and rear lights were too small, which could make the car look unbalanced, as lights are considered the “eyes” of a car.

Cooling & intakes:
A large side intake seemed unnecessary without a V8 engine. Koenigsegg suggested replacing it with an underside scoop to cool the Terrier motor and allow for cleaner side surfaces. I kept the two front air intakes to cool both the battery and front brakes.

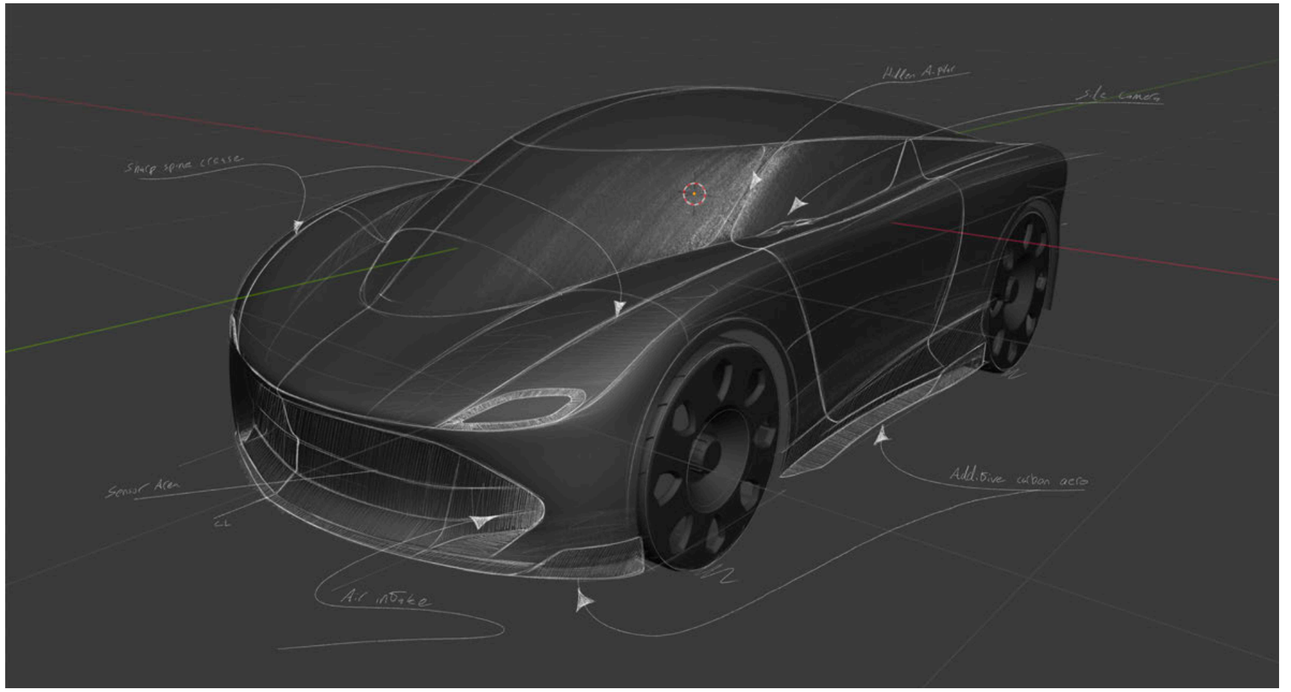
Proportions:
I chose a longer front and shorter rear overhang for a classic sports car stance and better packaging.

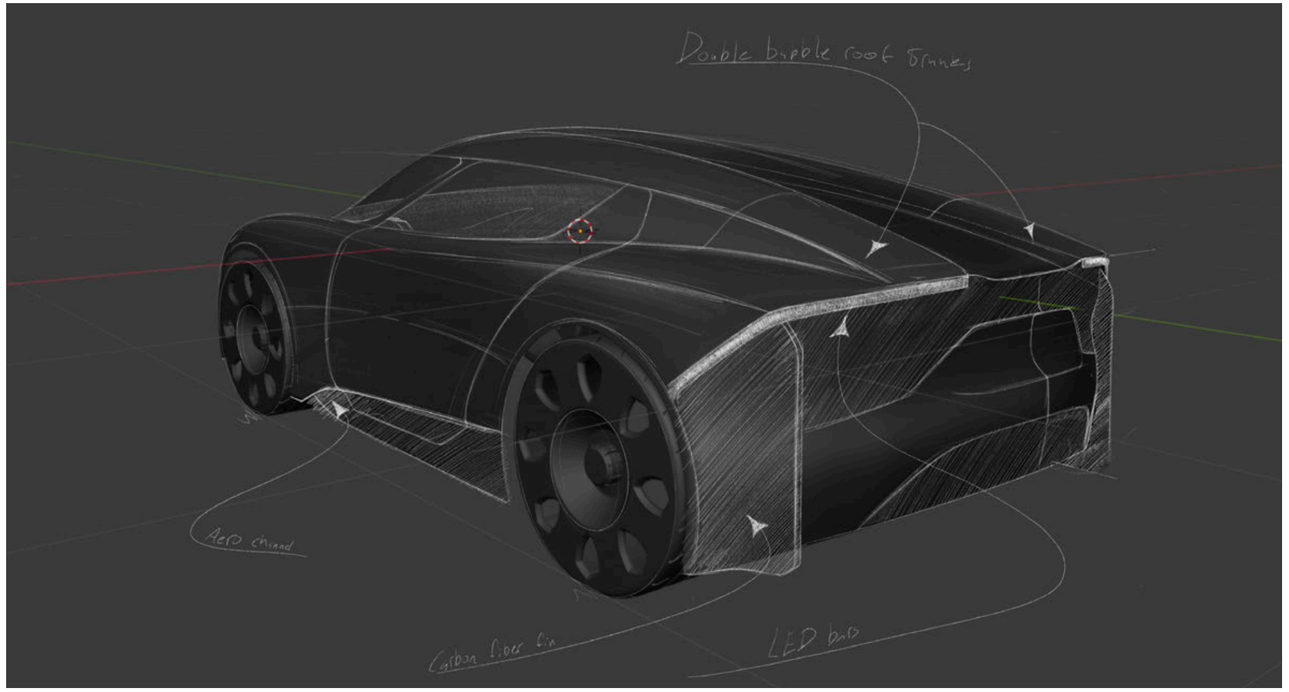


DESIGN DEVELOPMENT

For the process based on the feedback, the biggest difference was the light design, which I had now made a lot larger to give the Variera eyes and more of a character. I explored a more joined and organic front light design to see how that could work and potentially integrate a light bar. While the other variation was more close to what Koenigsegg currently did in shape, to bring that Koenigsegg feeling and look into a new segment but keeping it new for the Variera's light signature specifically.

Another big change was the front air intake areas and the sensor zone, and the aerodynamic bits around the car.

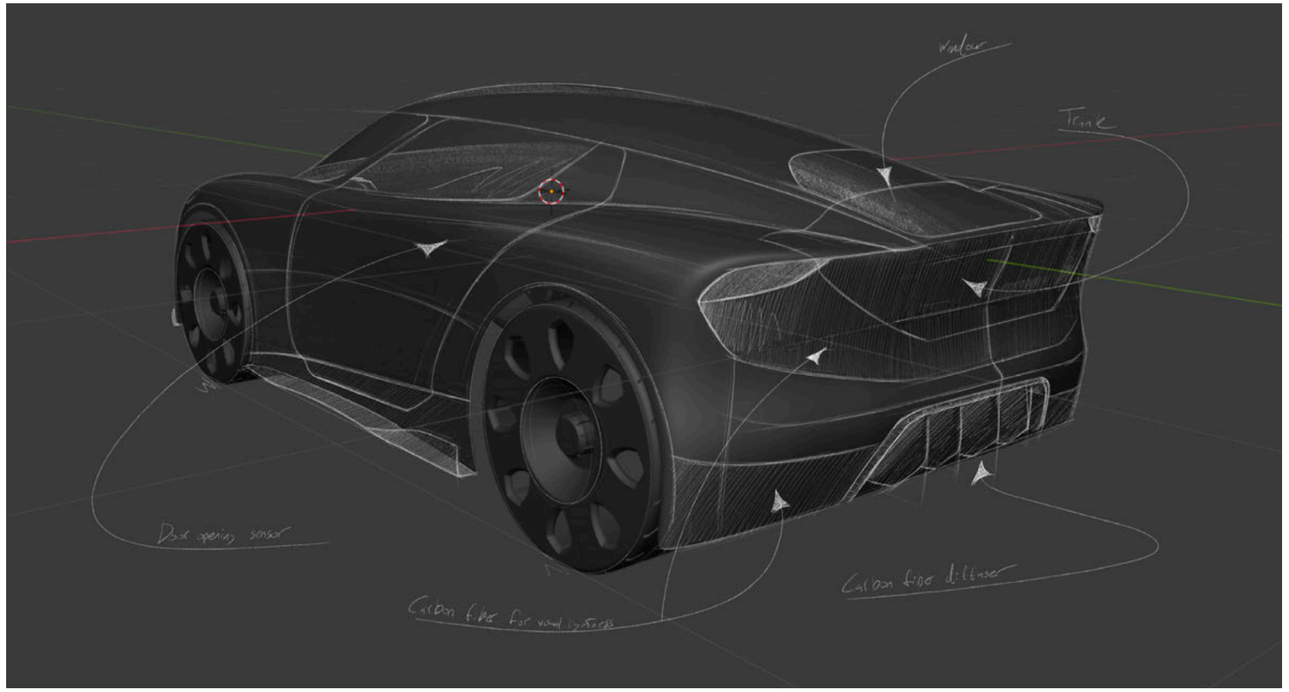


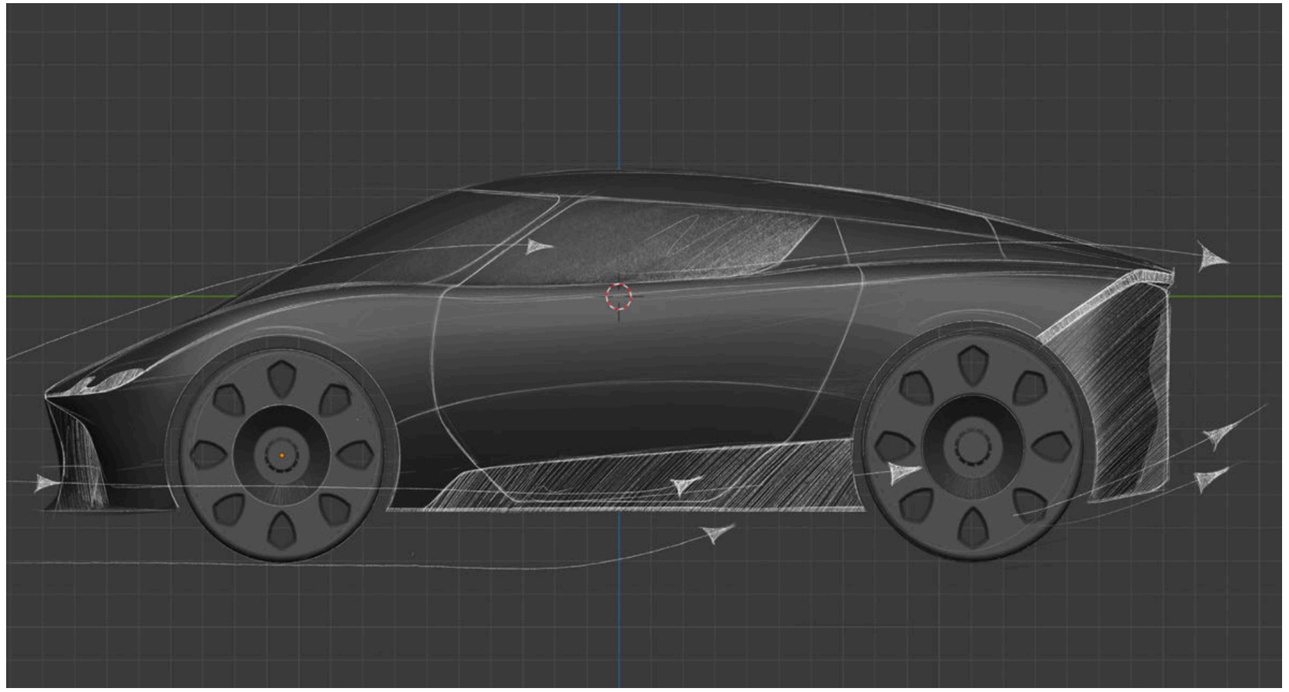


DESIGN DEVELOPMENT

Same as in the front, the biggest feature was mainly the light element, where I also explored how light bars could be integrated into the rear to connect the front and rear, while separating the rear lights into two bars to highlight the iconic Koenigsegg double bubble roof design. Whilest the second was a more traditional light design, where I put more of a focus on how the lights could create a frame for the trunk. One big change was whether to give the Variera a rear window or keep the roof closed and have cameras instead.

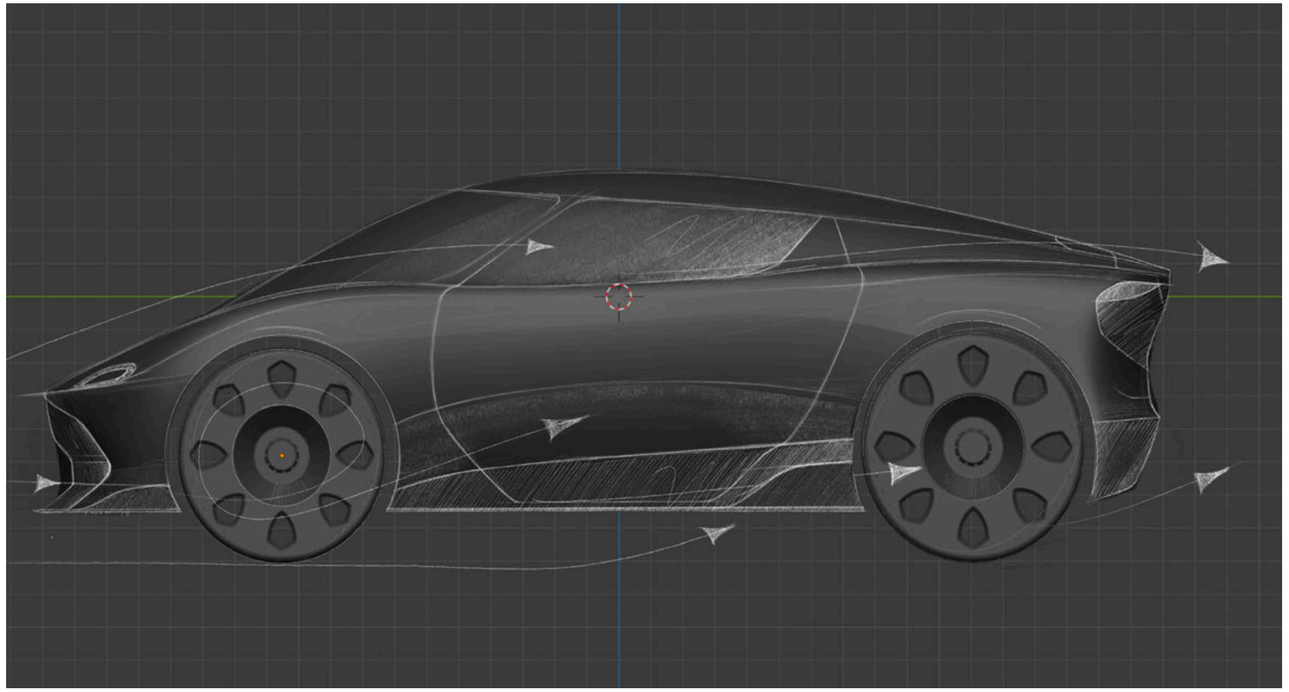
The rear aerodynamics were very different, as the top variation had large carbon fiber fins to help with airflow, as well as integrated crash structures and to give the Variera a more aggressive look. The second variation had no fins, but rather a more aggressive diffuser with multiple fins.





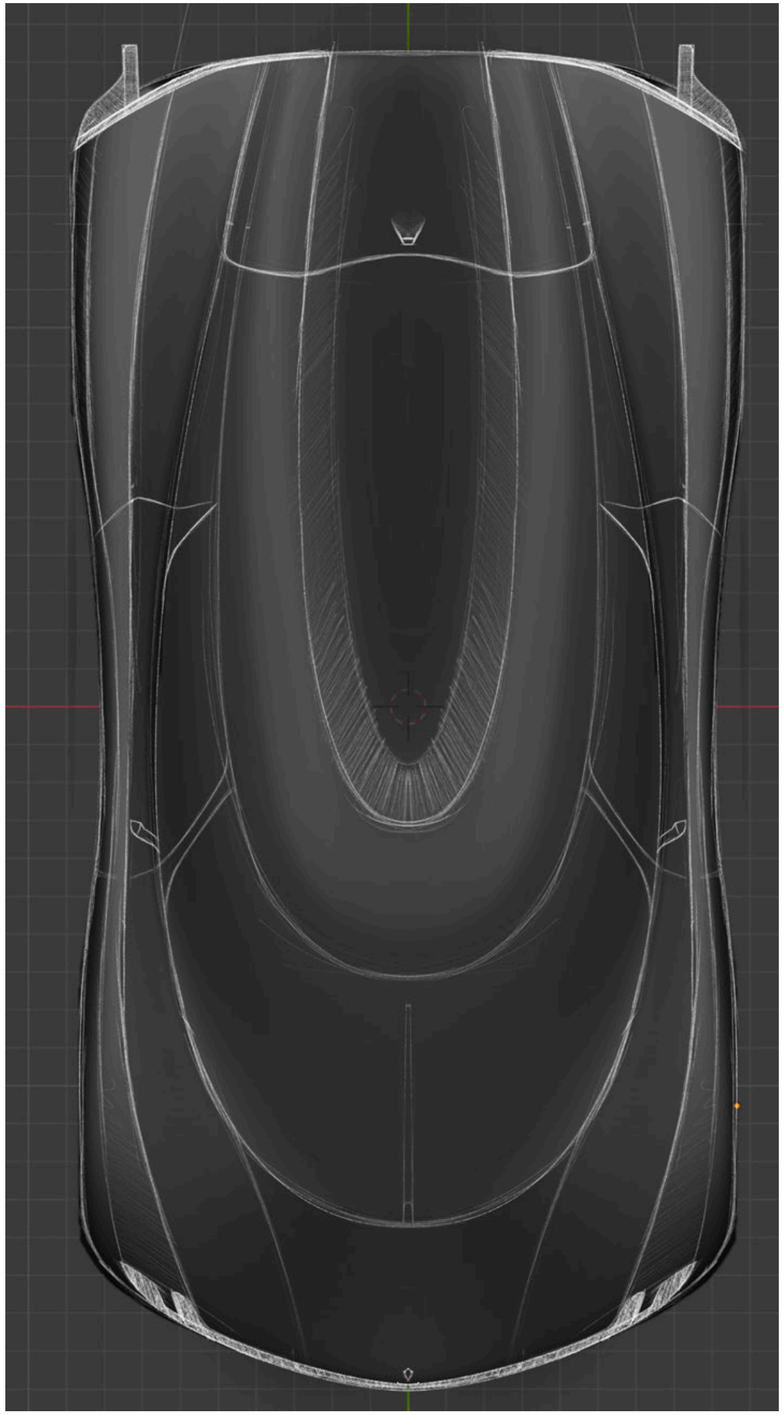
DESIGN DEVELOPMENT

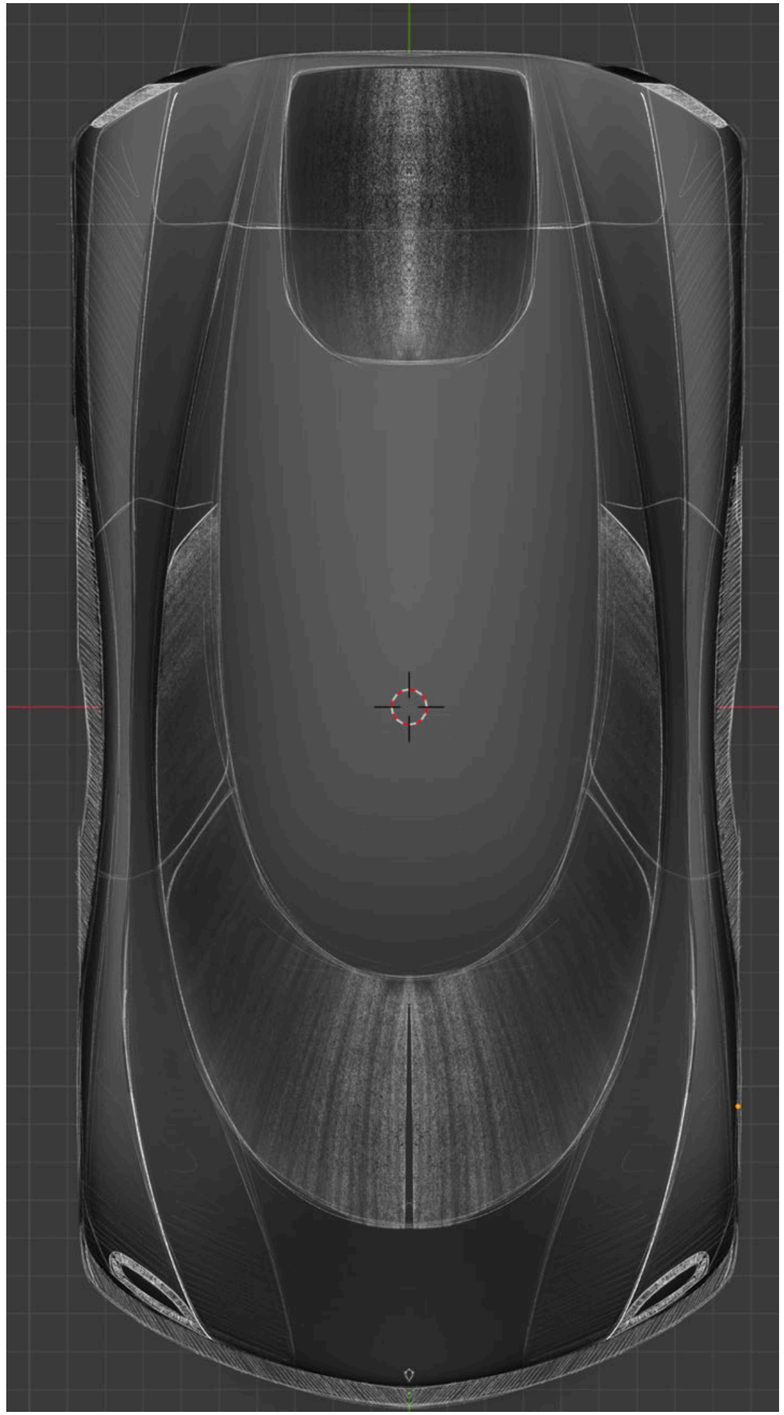
During the side view design development, I used this view to see how both the front and rear light designs would connect and to get an understanding of what would be more fitting for the Variera. But the main focus from the side was the aerodynamic elements like the side skirts and how they could be used and designed to both help with airflow but also potentially give the Variera more visual lightness while giving a distinct line between the body and the additive carbon fiber elements.



DESIGN DEVELOPMENT

The top views were to get an overview of all the previous elements I sketched and how they would look from the top — which would look more aggressive, more toned down, and more fitting for the segment.
One big element was how the decision of either having a rear window or not could impact the design, and how the double bubble could become an even bigger element in the design, or if the Variera wouldn't have a double bubble roof at all.
But the idea of a Koenigsegg without a double bubble roof quickly got shut down after thinking about the two options.





DEVELOPMENT FEEDBACK

After the previous feedback I got on the older variations, I received feedback on the two new variations, mainly from Koenigsegg, to get guidance on what to change or consider for the final design.
These were the points of feedback:

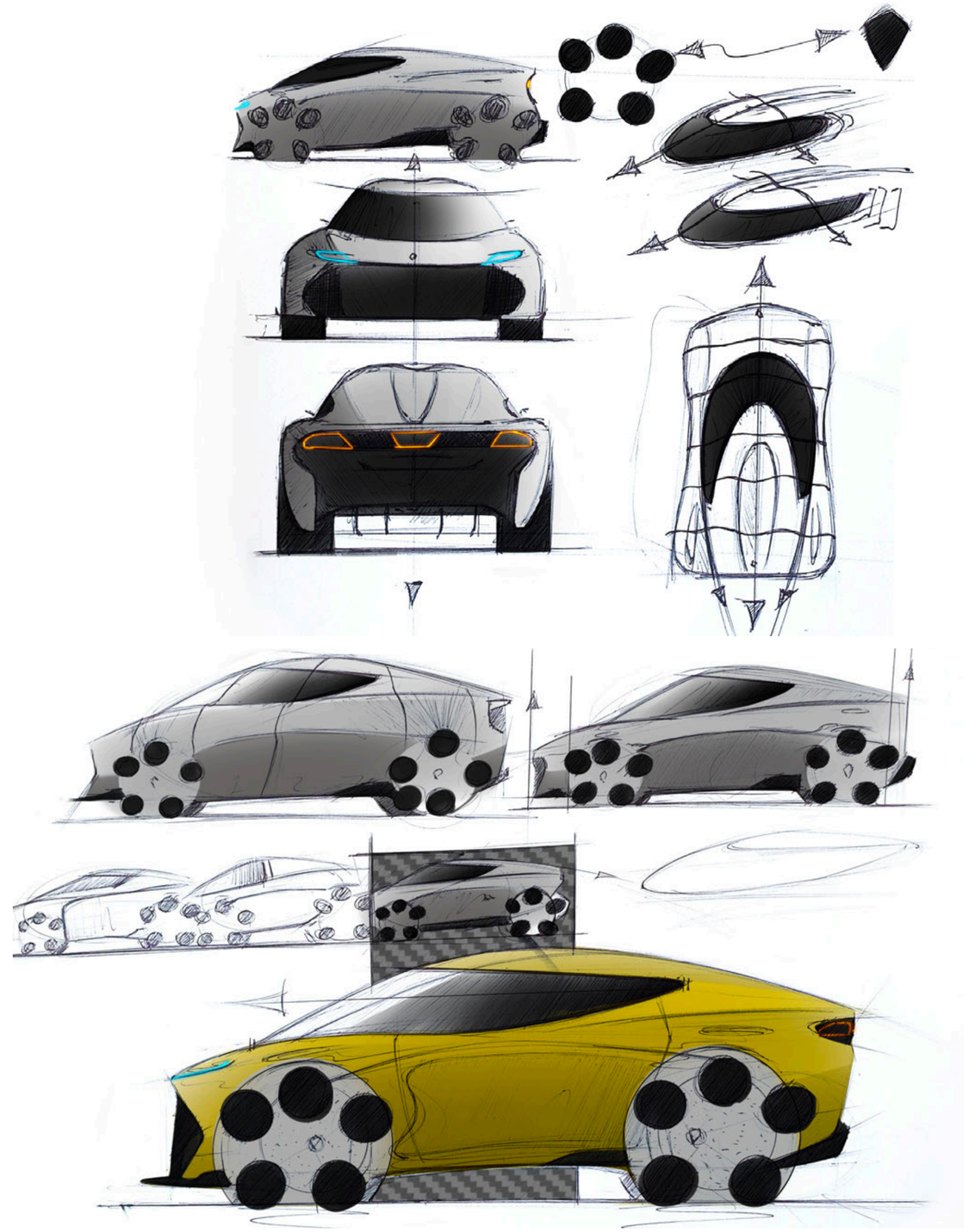
Rear diffuser:
Should be wider to give the Variera a sportier, more aggressive stance and avoid looking tame or similar to other brands.

Rear window shutline:
On version 2, Koenigsegg suggested removing the shutline across the rear window for better usability — an ergonomic point I hadn't fully considered, though I was leaning toward a no-window design and ended up going that route, removing the rear window entirely.

Version preference:
Koenigsegg favored version 1, especially the rear design, for its innovation.
However, the rear lights needed improvement, as two separate LED bars didn't create a distinctive enough signature.

DESIGN DEVELOPMENT

After all the sketching and ideations, by this point I decided that I was close to finding the design I wanted for the Variera, so I could move on into 3D — and also so I didn't spend too much time sketching, allowing me to manage my time in a productive way.



DESIGN DEVELOPMENT

Kept refining and getting closer to what I wanted the Variera to be, and eventually landed on this look: a compact yet stanced car that looks like a Koenigsegg got shrunk in its length but still looks like a performance car.

DESIGN DEVELOPMENT

At this point in the design process/development, I knew what the Variera would look like and how I wanted it to look based on the previous variations, feedback, and design analysis. So I ended the sketching process with a typical stylized BIC pen drawing and combined the colors with Procreate digitally.

INTERIOR CONCEPT

During the final exterior sketching process of this project, I mostly focused on the exterior since this project was only really focused on the exterior design of the Variera. But during this stage in my design process, I wanted to at least do some form of visualization of what the Variera's interior could possibly look like. To both explore sketching a car's interior, which I don't do that often, but also to show that I had some sort of consideration when it came to the interior of the Variera.

INTERIOR CONCEPT

Once I had a sketch of the interior when the Variera would be in full self-driving mode with the steering wheel hidden, I used Vizcom AI to see what results I would get based on the interior sketch — both to explore possible interior CMF variations and also for fun.



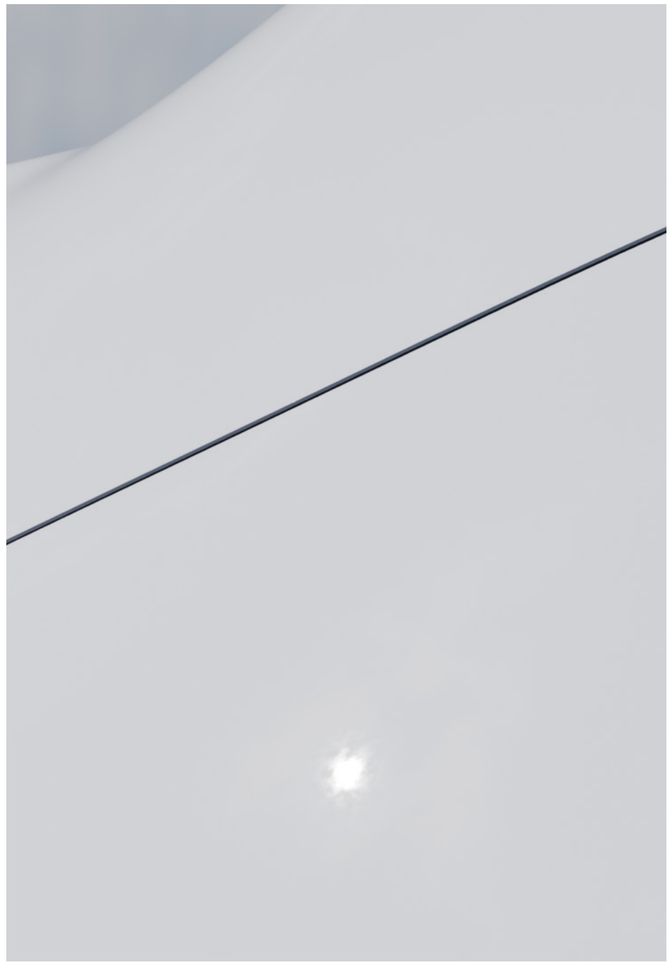


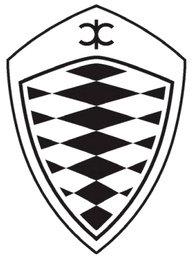

COLOR - MATERIAL - FINISH

The CMF process for my project was mainly focused on the exterior colors, materials, and finishes, as the focus of the project was to design an exterior for the Variera rather than the interior.
Although there was also ideation when it came to colors, materials, and finishes for the Variera's interior as well.
A big element in understanding what CMF would be used on the Variera came from the Koenigsegg factory visit and guide, where I got to look
around and feel the materials and how they all worked together to allow the customers of Koenigsegg to specialize their cars' CMF personally to
make them unique. This helped me apply my own taste into the CMF inspiration board and change it depending on personal taste and the goal of the Variera.

CMF INSPIRATION

When looking for inspiration, I started with the exterior color. I have always loved white cars despite it being such a basic color, since I think it looks clean, especially on cars with great surfaces like Koenigsegg. Another factor, when it comes more from the material aspect that also influences color, is the carbon fiber. Since Koenigseggs are made of carbon fiber, the material is crucial in the CMF and how it's applied and in what configuration. The finishes on the exterior are what match and separate the materials to highlight the glossy paint and the carbon fiber. Meanwhile, the additive aerodynamic elements create a sharp contrast and striking visual CMF, especially when the dark carbon contrasts with the white paint.
A touch of strong color added in smaller amounts adds to the finish aspect — giving that extra little touch to break up the black and white theme while providing a color to translate into the interior.





3D MODELLING

SCALE IS IMPORTANT

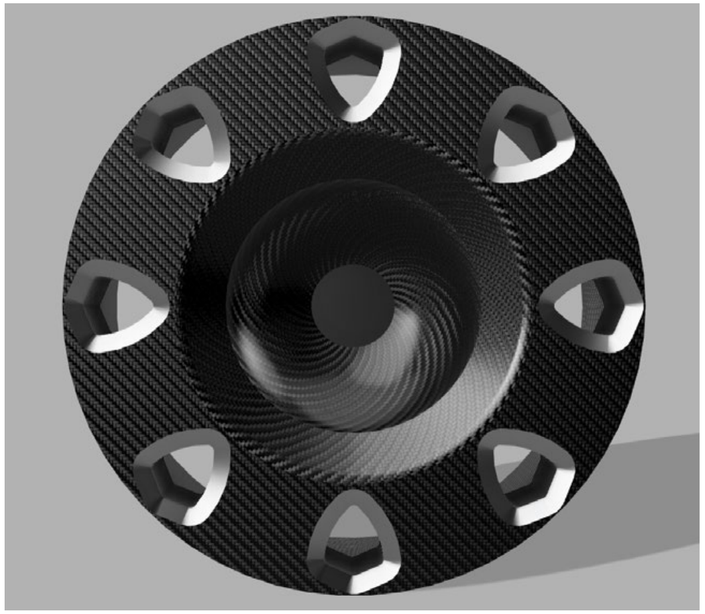
When I started the 3D-modelling process for the Koenigsegg Variera, this was when finding the right scale and dimensions became the main goal.
Since if the scales were off on such a complex shape as a car, everything would look wrong.
The way I went about finding the right scale for the Variera was by first looking at the dimensions of the Terrier electric motor's real-world dimensions, since I got a 3D model of it from Koenigsegg, which helped me get an understanding of scale. I also looked at other Koenigsegg models and found 3D models which I downloaded into Blender so I could reference the sizes between the Jesko and Gemera. This helped me see the size of the Variera and match it into the scale segment which I wanted the Variera to be in.
Once all of these steps were done, it was basically modelling by eye with these references and my own vision of what scale the car would be.

WHEELS ARE IMPORTANT

The wheels are like the shoes for a car and are a big part of the design, even if most people might not think about it, making them a very important element.
As one perfectly put it: “You can make a nice car with shit wheels look like a shit car, and a shit car with nice wheels look like a nice car.”

In the beginning, I already had somewhat of an idea of what the wheels for the Variera could possibly look like. One thing that was important to consider was that since the Variera would be for an entirely new segment and, in turn, not have the same proportions that people have grown used to and that identify a Koenigsegg.

ORIGINAL WHEEL CONCEPT

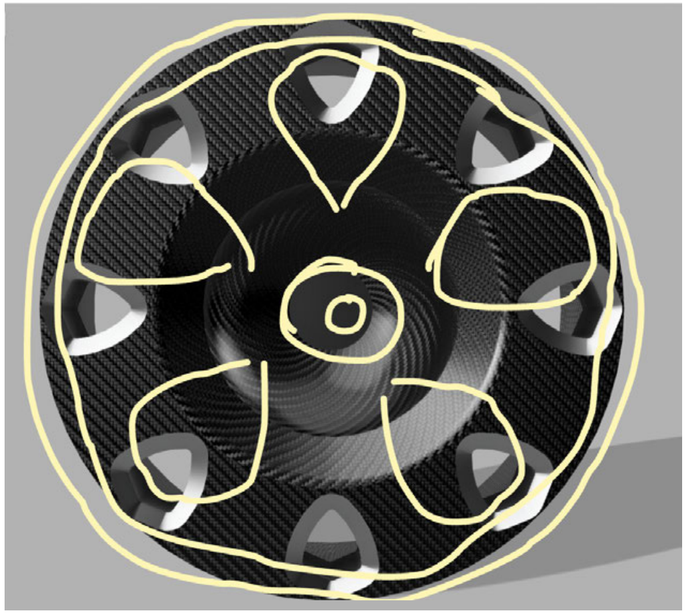


From the start of the project, I had an idea of incorporating the Koenigsegg shield somehow into the wheel design itself. Since the Variera would be in a completely new segment with new proportions, it risked the chance of not immediately being recognized as a Koenigsegg, so the shield incorporation would be a nice telltale way to address the Variera as a Koenigsegg.

CC850 WHEEL

Later on in the design process, I went back to the original wheel concept and decided to scrap it and look for inspiration while still keeping in mind to have the shield element. For inspiration, I looked at Koenigsegg's existing wheels, and immediately the CC850's wheels stood out, since I have always had a love for wheels with circular holes, and I loved how Koenigsegg had adapted the circular design while keeping the wheel design fresh.

ROUGH CONCEPT SKETCH

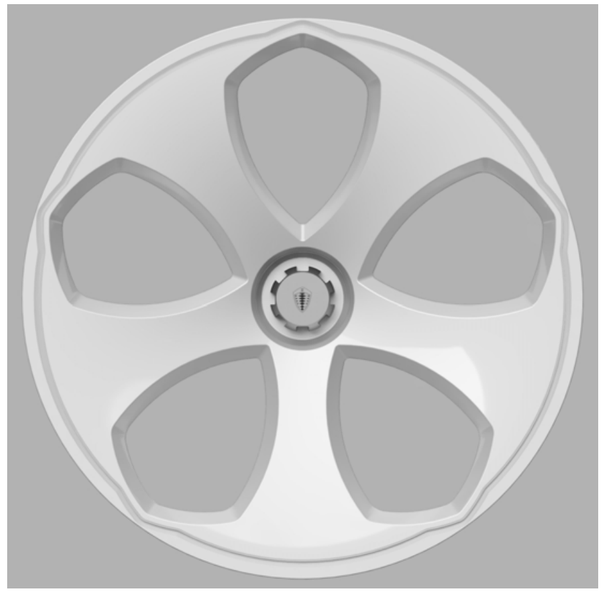


The end result was a quick and dirty sketch to quickly visualize how I would develop my original design while taking inspiration from the CC850.
This sketch would be used as the template for modelling the Variera wheels.

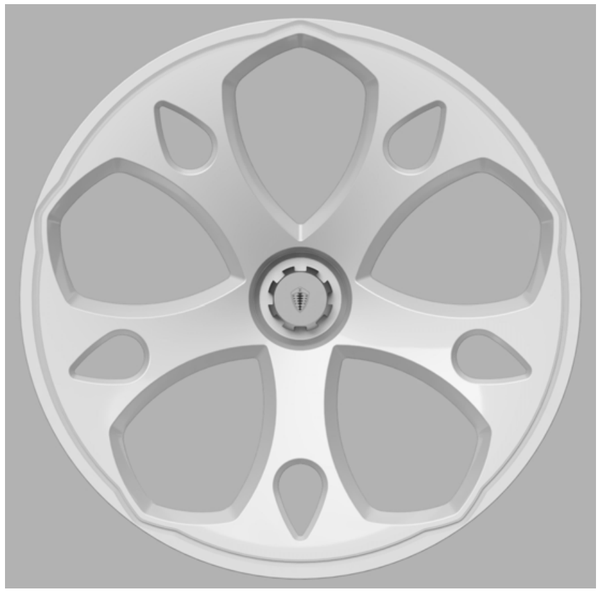
WHEEL DESIGN PROCESS

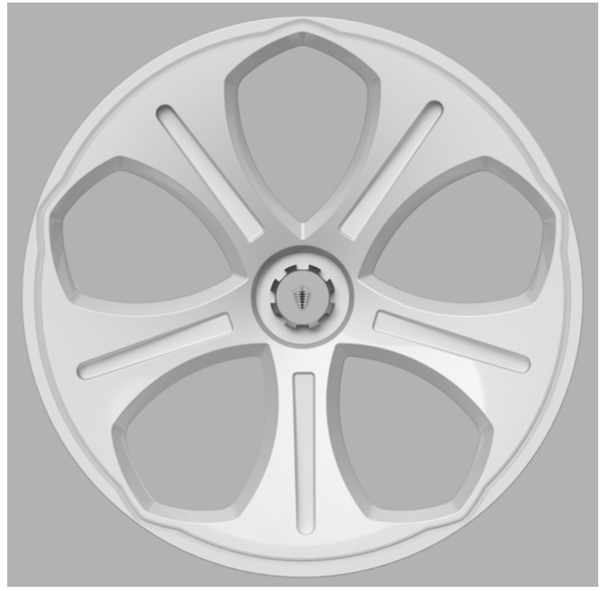
Based on the fast sketch, I went into Fusion 360 and started modelling the wheel. Once I had the wheel modelled, I decided that it needed more elements to make it both unique and more interesting than just a curved dish with shield holes. That's how I ended up adding a thin lip going around the outer side of the rim itself, which at each shield tip, the lip formed around it, giving it both a unique shape while also connecting the rim and lip rather than having the lip be an awkward attached element.
Once the lip was done, I started looking at ways to remove mass on the actual rim itself. The first version was adding teardrop-shaped holes as a nod to Koenigsegg's teardrop greenhouse, but I felt it didn't match the rest of the wheel design. The third version I decided to add thin imprinted spokes between the shield holes to give more surface interest, which I was very pleased with the result. For the fourth version, I decided to do the same thing, but this time based on a comment from Koenigsegg, I made the spokes thinner towards the center and wider towards the lip so it would follow more the shield shape—that being that the shield was slimmer towards the center and wider towards the lip.

V1



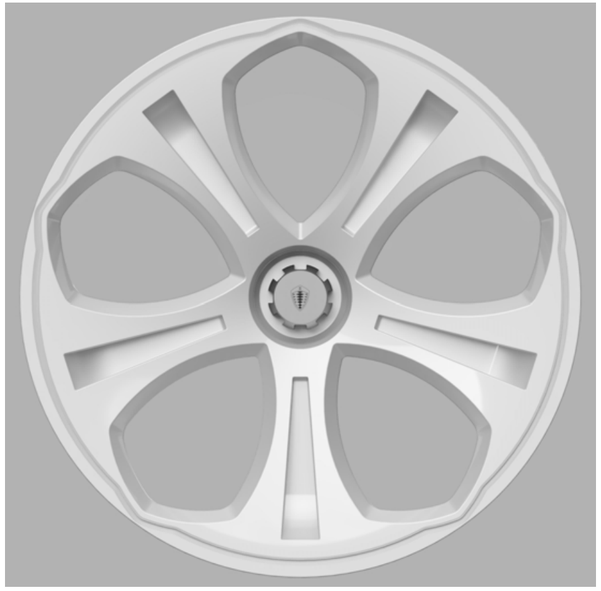
V2





V3

V4



WHEEL DESIGN PROCESS

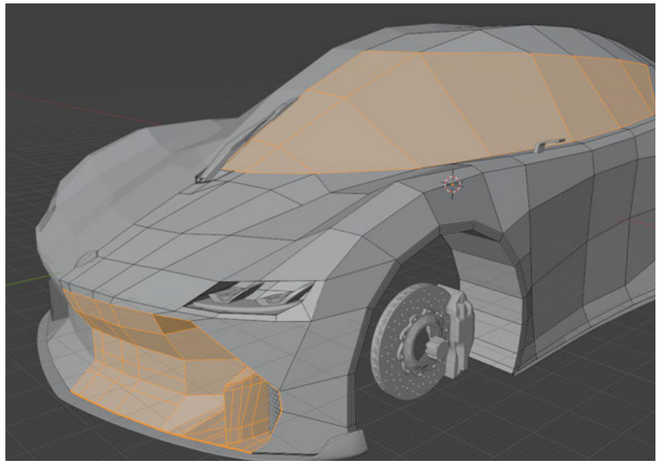
After deciding on the version of the wheels, I imported the rim design from Fusion 360 into Blender and started applying the CMF based on my CMF inspiration until I got the desired result I envisioned when I drew the original sketch. A simple but very effective feature I decided to add was the colored tire lettering, since growing up playing GTA V, Forza, Need for Speed, etc., I have always had a soft spot for tire lettering. The ability to also have it in colors made the possibility for customer options more fun as well.

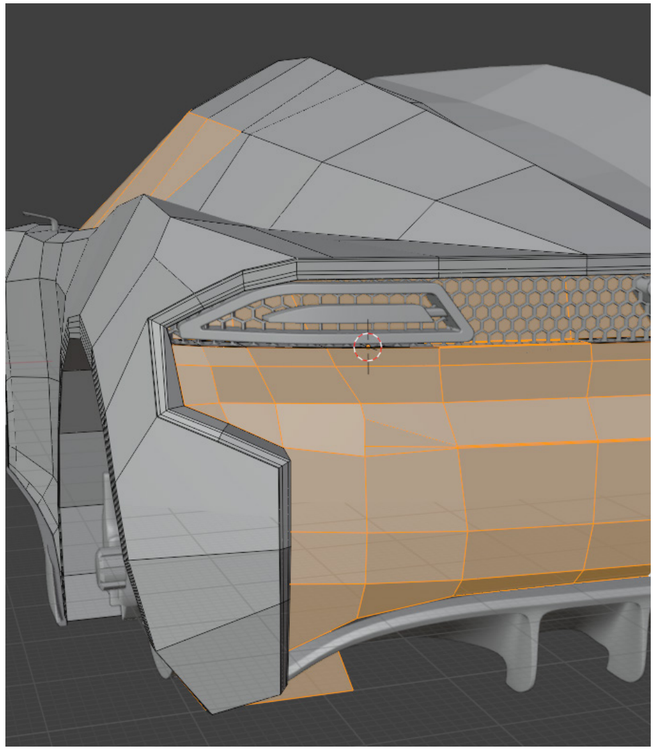
3D-modelling

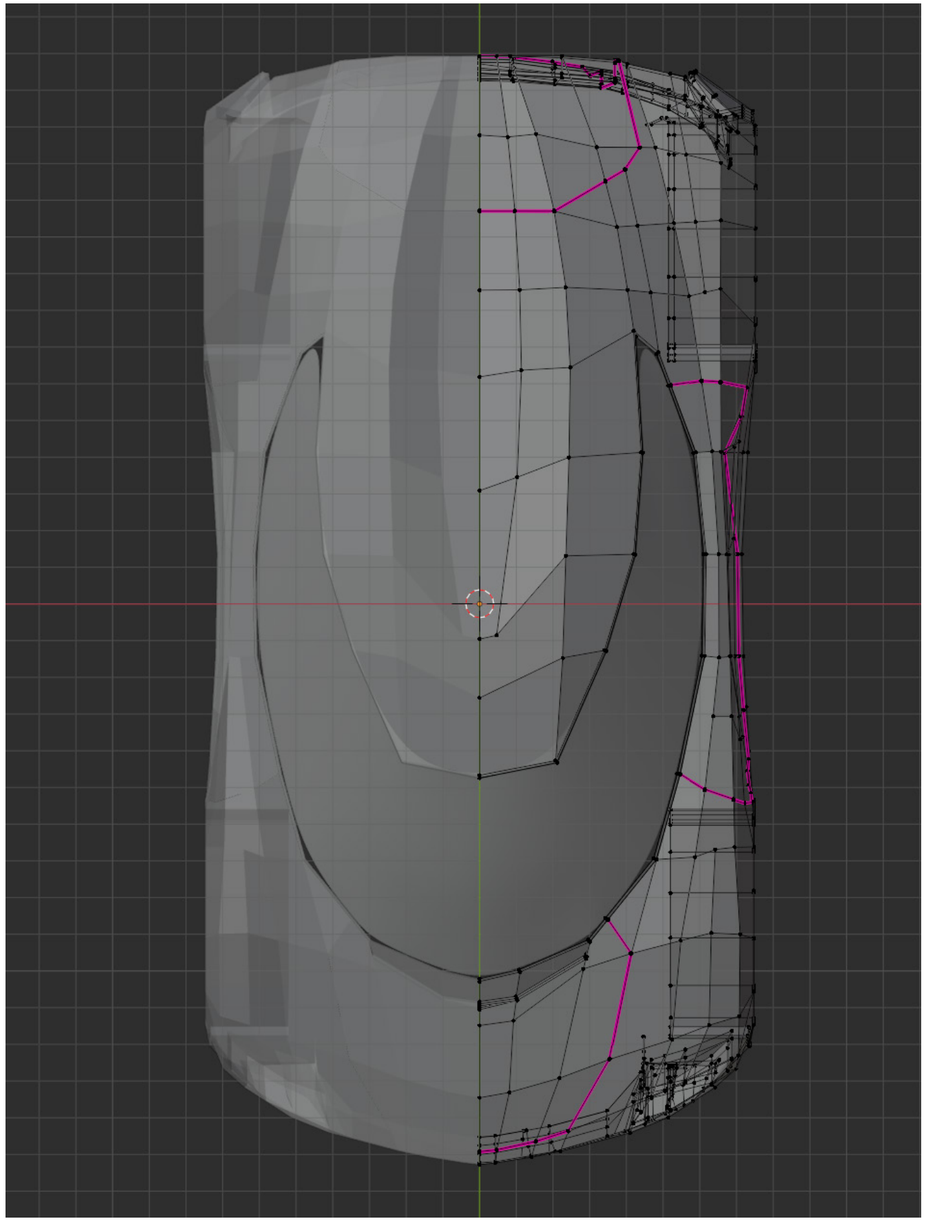
Once I had made the final design sketches of the Variera and completed the CMF inspiration to help me both visualize and understand how the Variera would look and what it would have in common with the CMF of other Koenigseggs, I started modelling it in Blender.
During this process, it was the most difficult part of the project since this was only the second thing I had ever done in Blender besides a donut. So, the images of the process at the time were not the top priority; hence, the images were done later on from previously saved files from the initial modelling process.

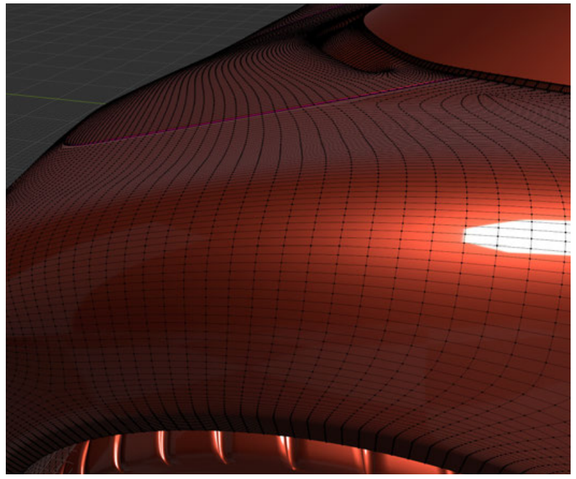
BLOCKY IN THE START

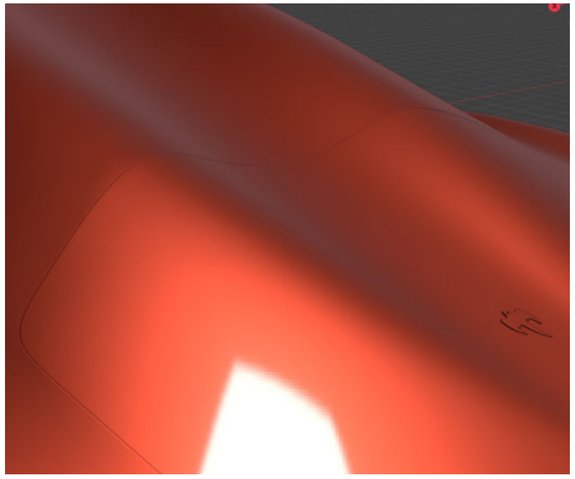
The way I modelled the Variera in Blender was by using technical sketches of the car in the following views: front, rear, side, and top. In the beginning, I started with a basic block shape of the Variera's general proportions, and once I had that, I then started adding more topology/geometry to give the shape more defined design elements. I used Blender's modifiers such as the mirror modifier, which, as the name suggests, mirrored the model so I could focus my work on only one side rather than on two. However, the most important modifier when it came to modelling the Variera was the subdivision modifier, which basically turned the blocky shape into a smooth automotive shape instead.

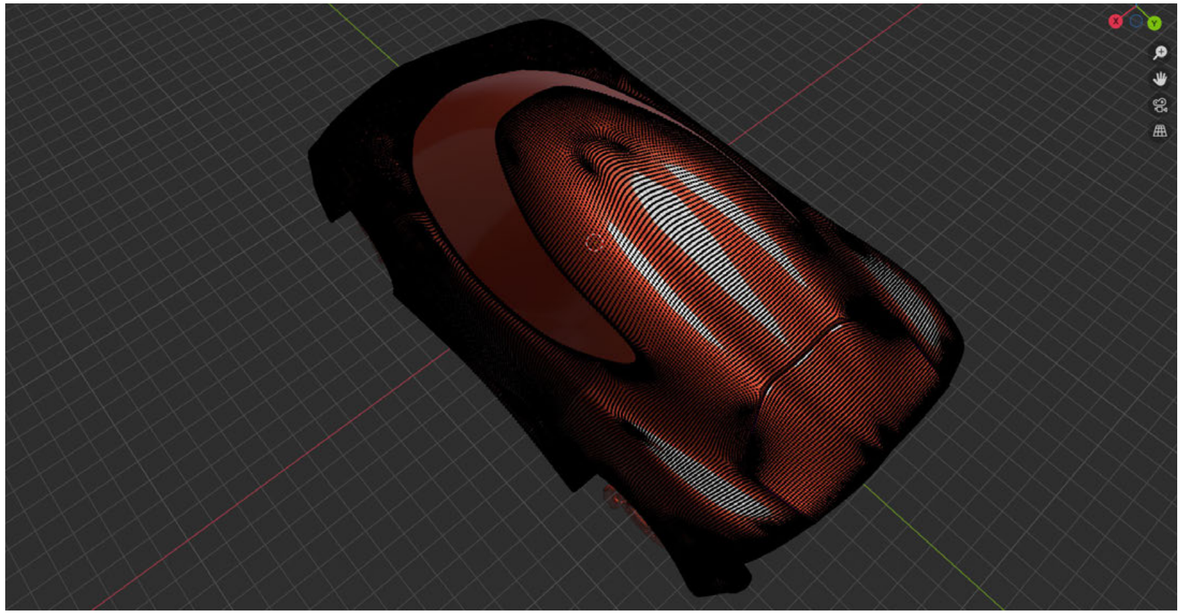








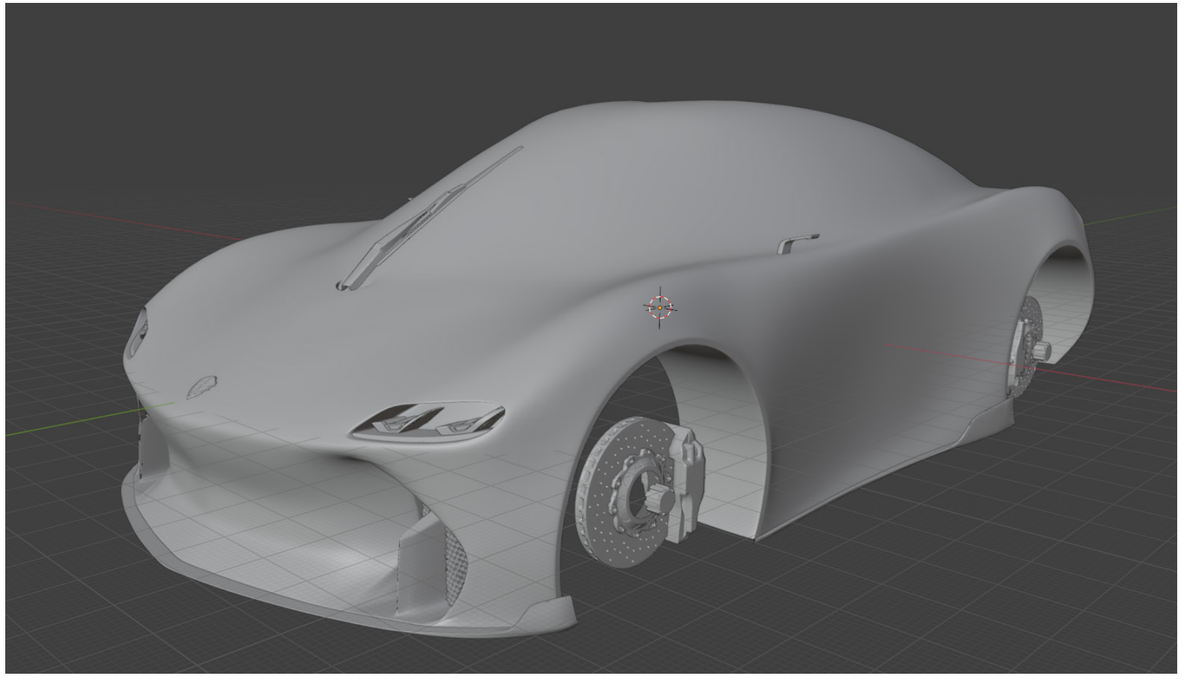




SMOOTHING IT OUT

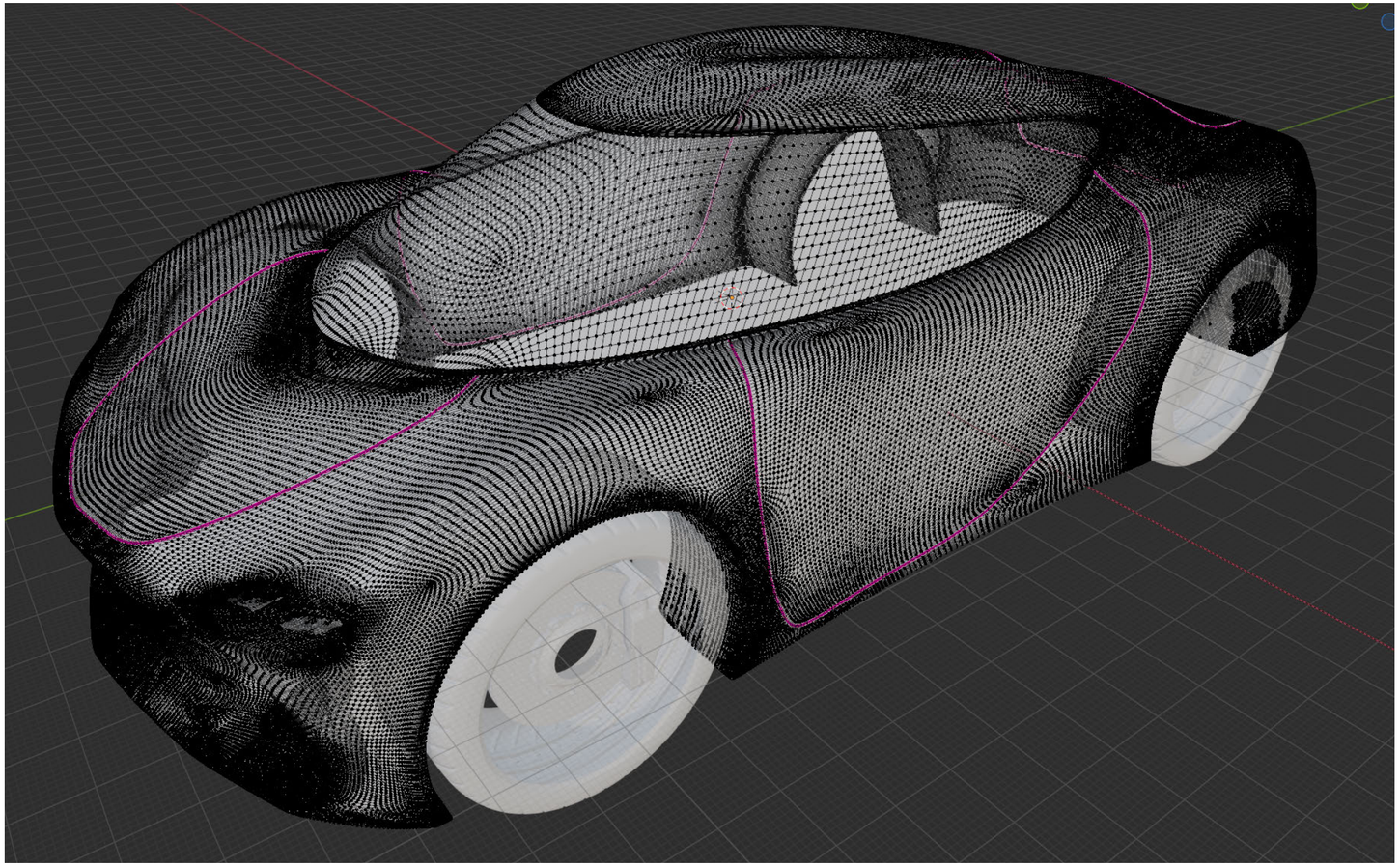
As I mentioned, the most important modifier was the subdivision modifier, which is perfect when doing automotive design work in Blender. This turned the shape into a smooth and organic form, which in turn added more geometry—hence why the body of the Variera has all of those dots, which are individual points that I could move. This modifier was only used once the model was done since working with such heavy topology from the start would be inefficient and wasteful.

During the modelling phase, to prepare the Variera file for 3D printing, there was trouble giving the Variera model thickness, since in Blender it was just a digital shell with no real thickness, which was needed to even be able to 3D print.
Once this was fixed and the Variera got a small thickness, I further prepped the body by making two versions of the Variera body. One was thin with no inside, while the other I did later where I eyeballed the insides of the body and filled it in, which in turn closed off the front air intakes on the physical model.



FINAL MODEL TOPOLOGY

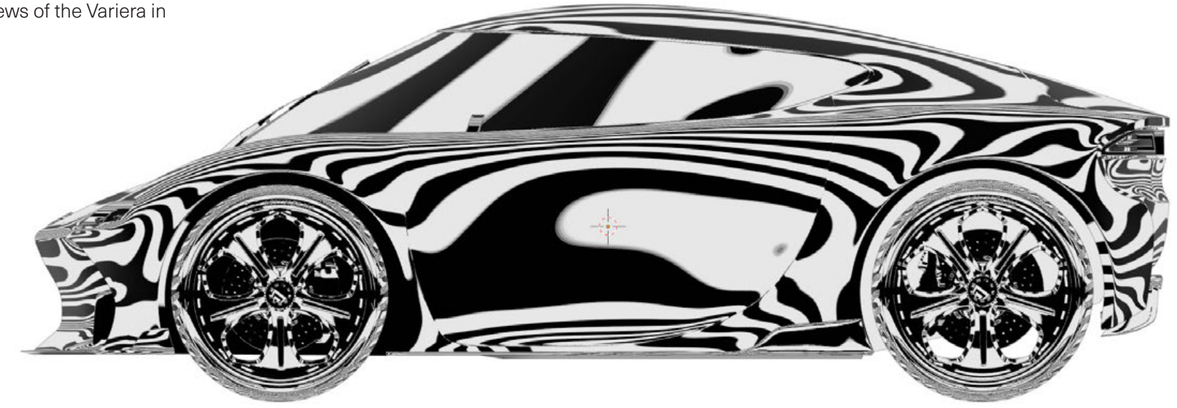
Here is what the Variera's body looked like once the modelling was done and the subdivision and mirror modifiers were applied, to achieve the smooth automotive shape while also having enough detail for the headlights, air intakes, etc.—hence the areas where it gets darker, since those areas had closer topology compared to, for example, the doors.



THE ZEBRA ZONE

The zebra zone is named after the shader I used when modelling the Variera in Blender to make sure that the surfaces didn't have deformities.
The way the shader works is by giving the entire model a black color with white stripes that warp around the surface, in turn giving the Variera a zebra-striped appearance.

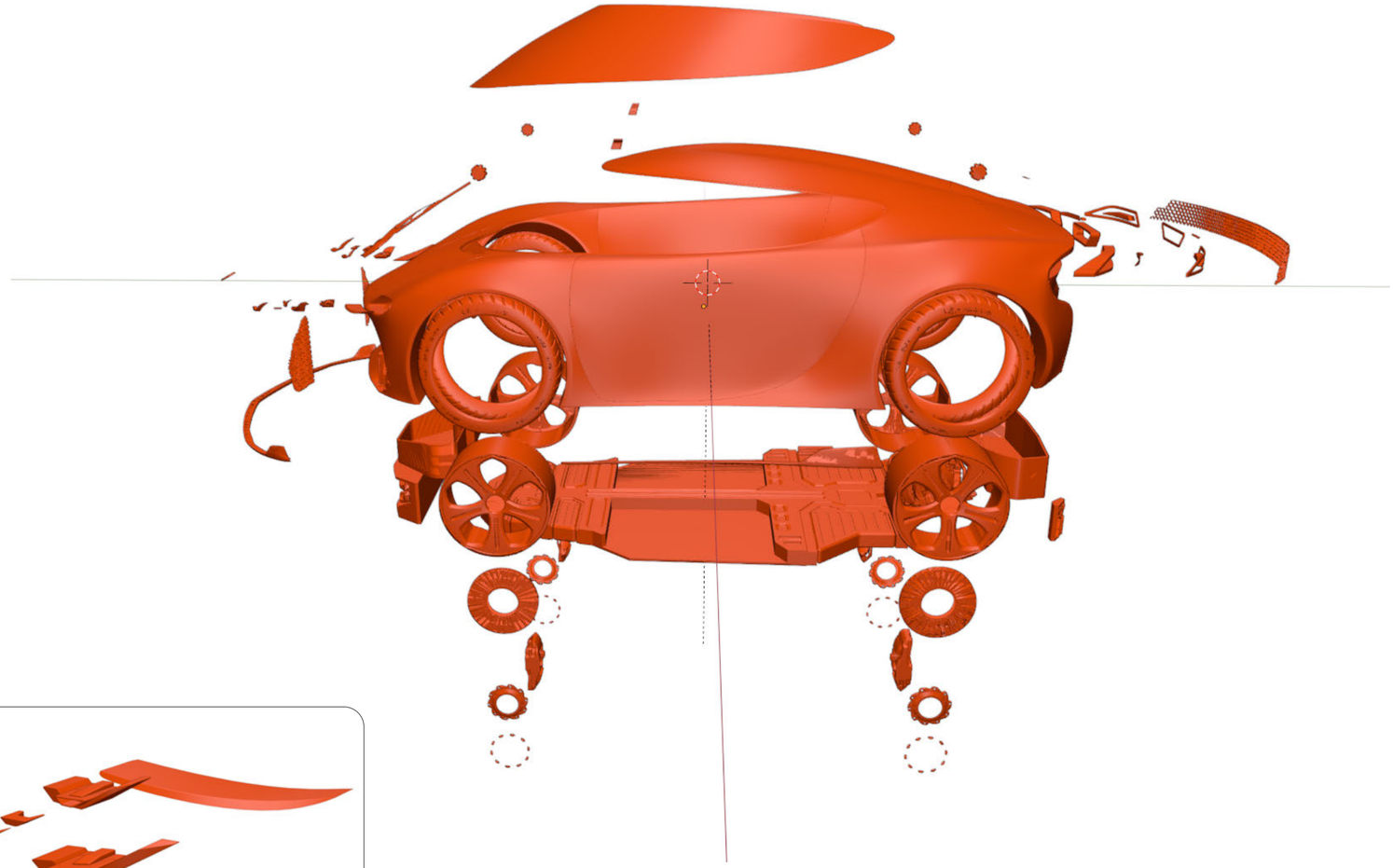
Top, side, front, and rear views of the Variera in zebra mode.

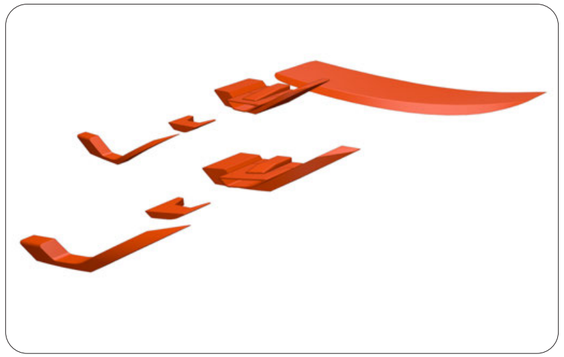


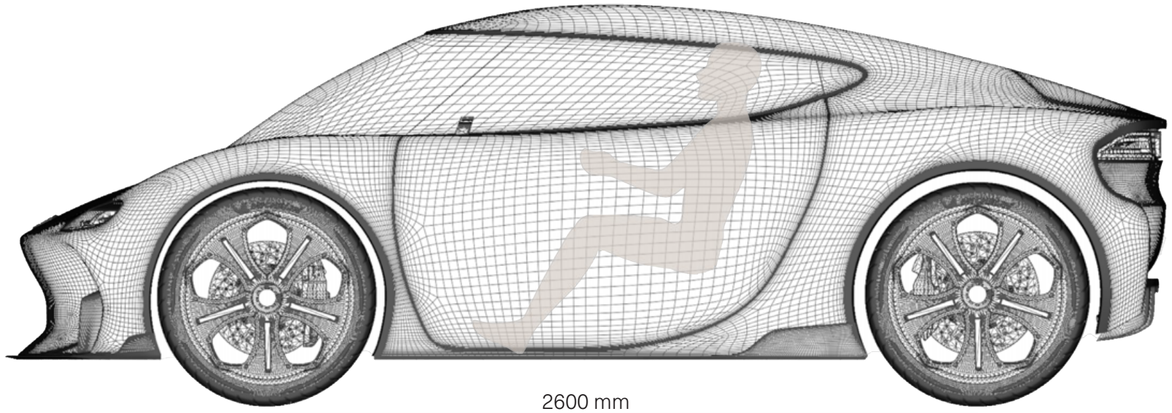
COMPONENTS EXPLODED VIEW

The Koenigsegg Variera modelling process was a mix between Blender and Fusion 360. The parts that needed to be more organic, like the body, were modelled in Blender, whilst parts such as the battery pack were modelled in Fusion 360.

The smaller framed image is a close-up of all the individual parts that make up one side of the front headlights of the Variera, to give a better understanding of how many parts went into the components of Koenigsegg's Variera design.



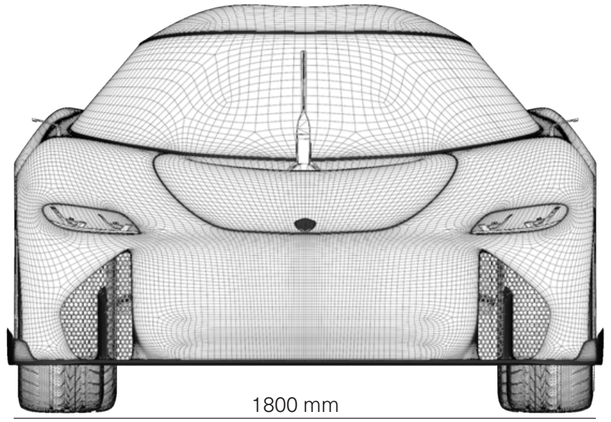




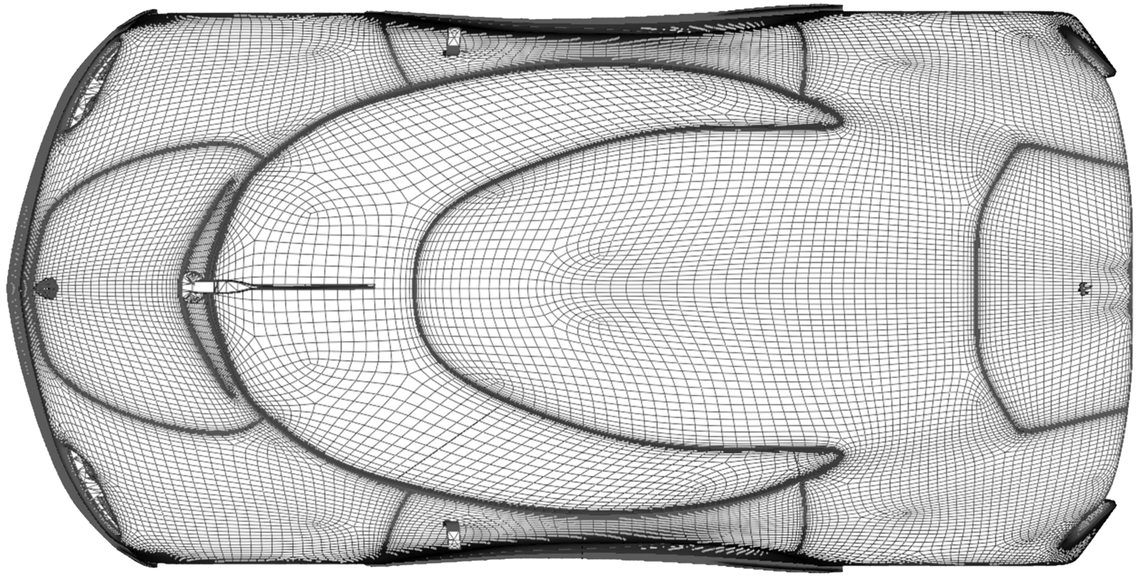
2600 mm

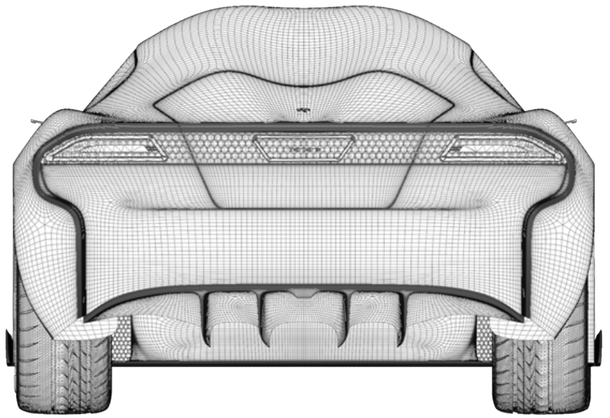
4315 mm

1486 mm



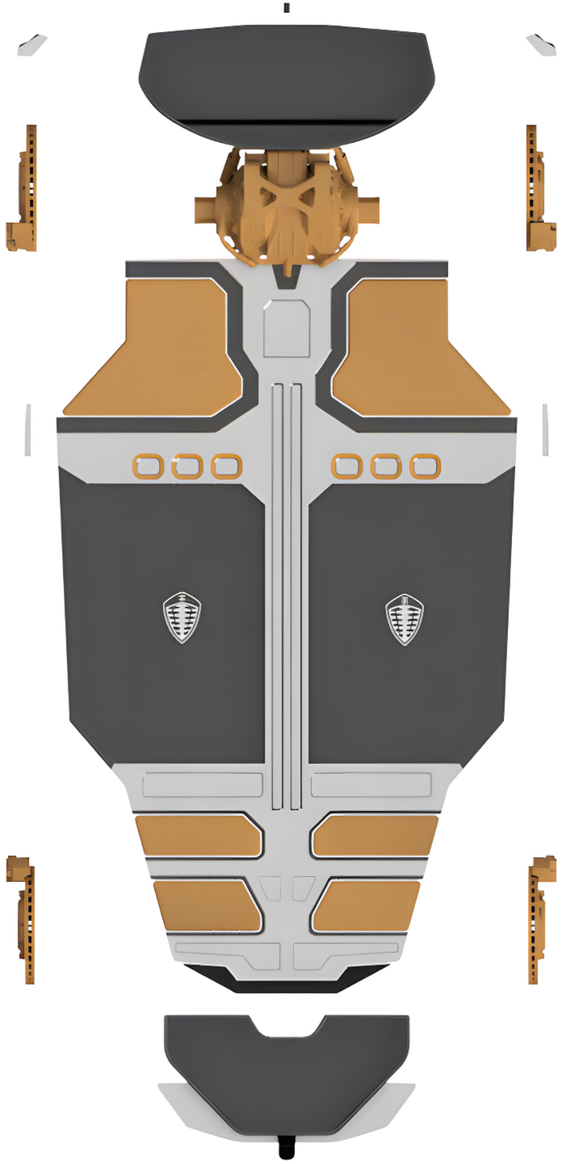
1800 mm





TECHPACK COMPONENTS

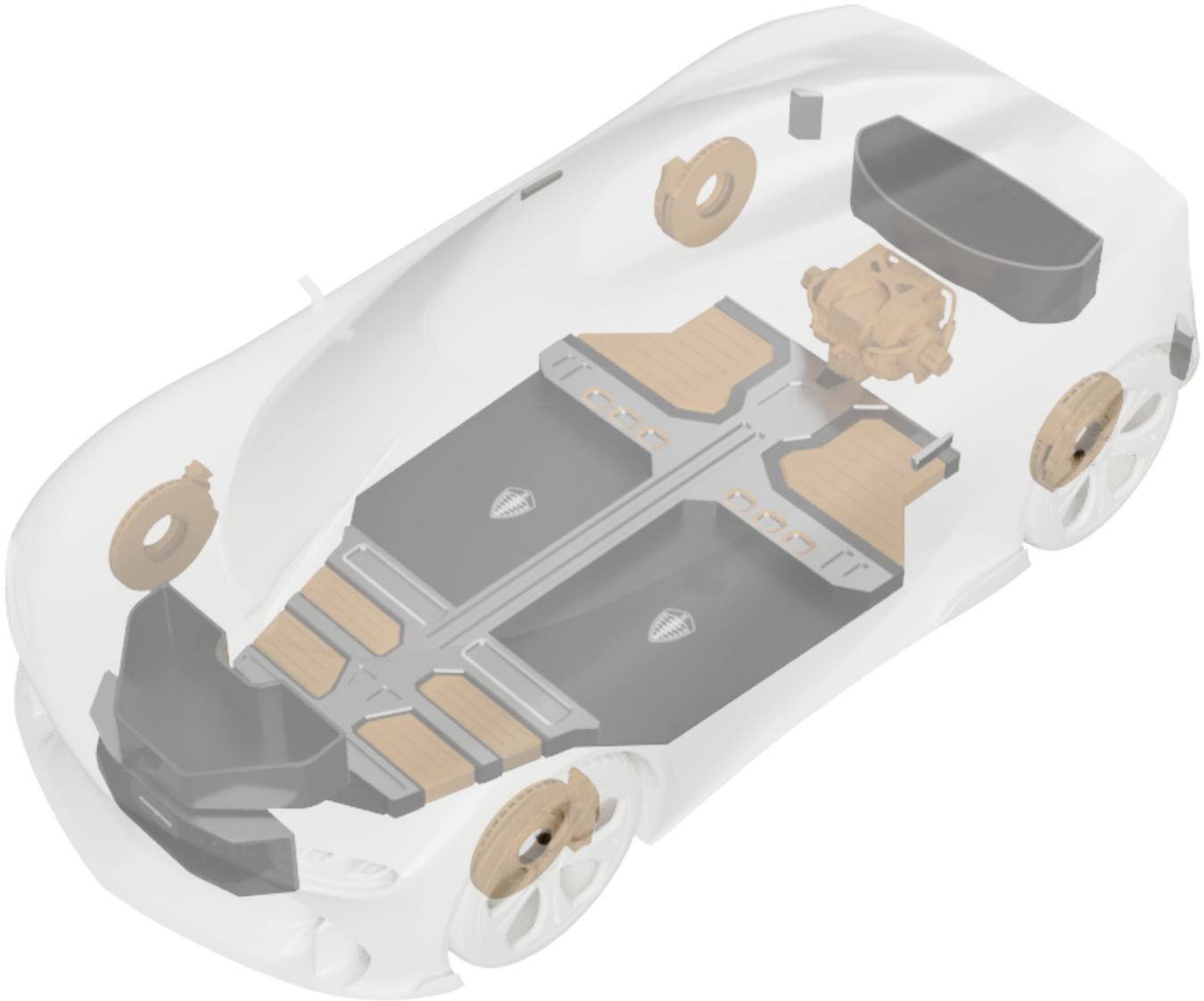
The top view of the tech pack, which fits inside it, shows the packaging designed to make it a practical commuter with added storage in the front and a compact fit to reduce wasted space. It also features two lowered areas in the battery pack construction to provide both more headroom for the passengers and a lower seating position for a more sports car driving position and feel. Not to mention the Terrier motor, which provides a fun yet brutal rear-wheel drive (RWD) experience once the Variera is in sports mode.

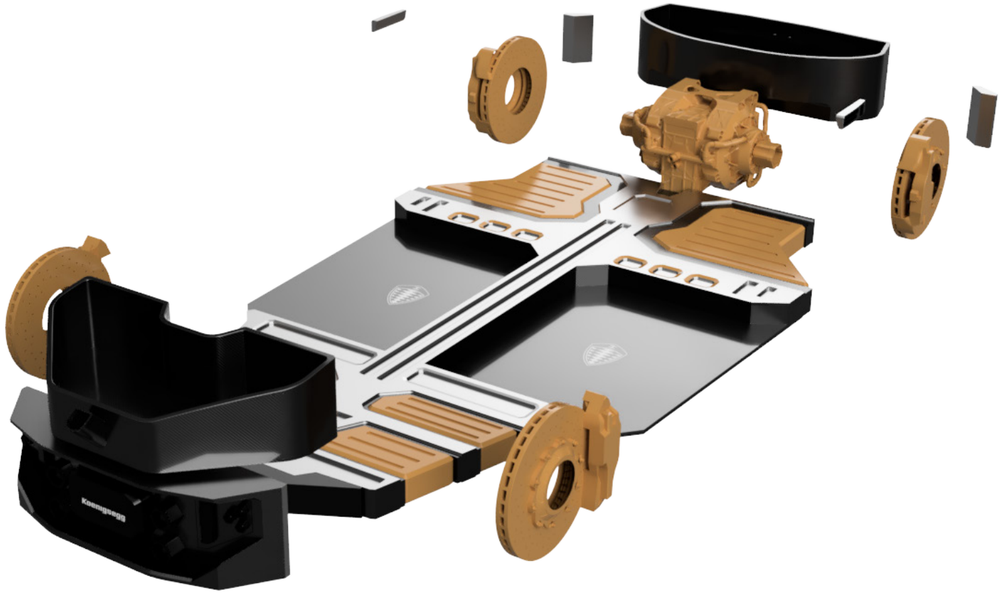


Rear camera
Rear sensors
Rear bagage area “Trunk”
Rear brakes
Terrier electric motor
Door opening touch sensor
Battery pack
Front brakes
Front bagage area “Frunk”
Self-driving technology zone
Charge port

TECHPACK VIZUALISATION

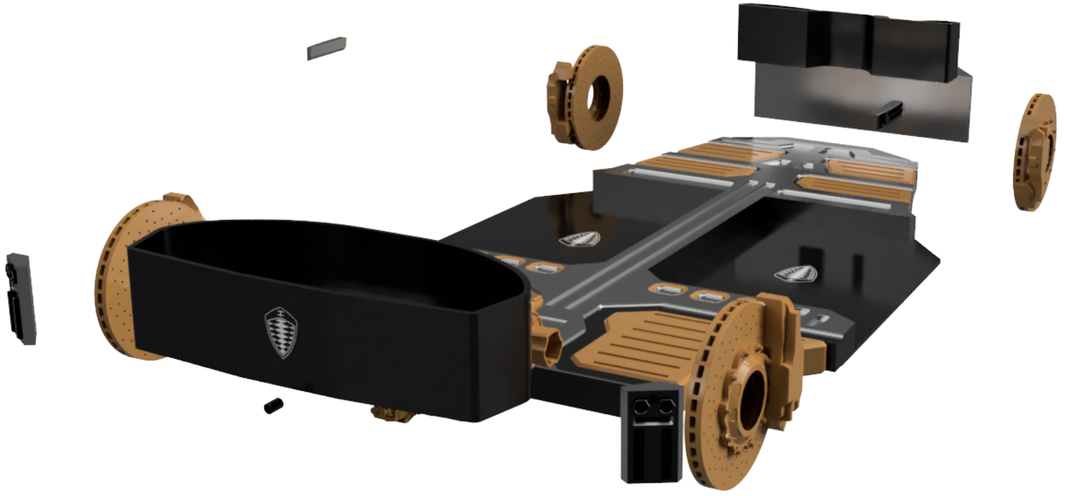
The images are to show the tech pack beside the car and how its placement inside doesn't compromise the compact yet spacious design and proportions of the Koenigsegg Variera.





TECHPACK VIZUALISATION

Front, rear and a side renders of the Koenigsegg Variera tech pack.



SIZE COMPARISON

This was to give a better understanding of the Variera's size compared to Koenigsegg's existing products, in this case being the Koenigsegg Jesko and the Koenigsegg Gemera. For human scale, I added a 1:1 scale human.

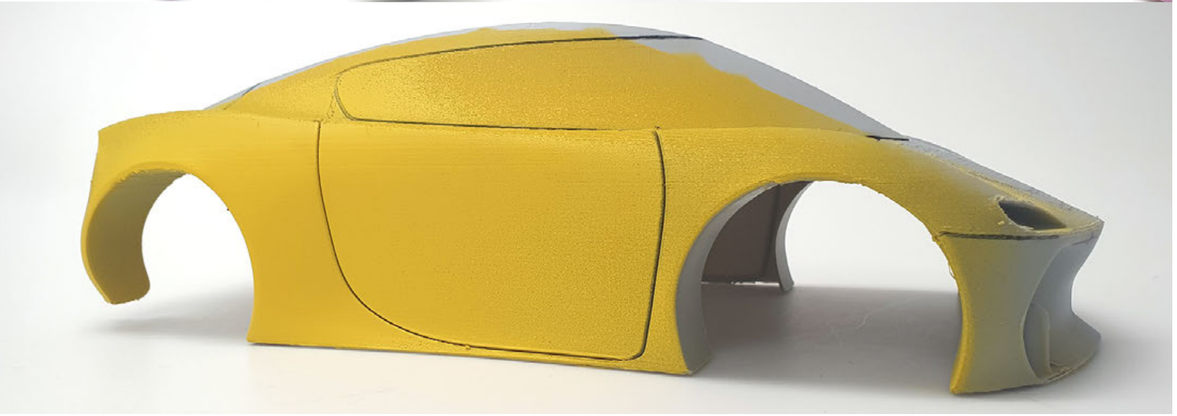
PHYSICAL MODEL

PHYSICAL MODEL

During the process of making the physical model of the Variera, I used 3D printing for all the parts. I printed both at Lund University and at Koenigsegg.
The parts from Koenigsegg came in a beautiful package.

PHYSICAL MODEL

All of my test prints leading up to the final prints from Lund University and Koenigsegg. During this part of the physical process, the main focus was to figure out the scale of the model since I didn't want it to be too small or too big. As well as testing how I could potentially assemble the Variera by printing it in smaller pieces—for example, having the window and body separate. Not to mention fitment of the side skirts, diffuser, etc.



PHYSICAL MODEL

Since the method to produce the physical model was 3D printing, the process used to refine the parts of the Variera consisted of sanding from P80 grit sandpaper to P400 smooth sandpaper, including wet sanding. In between each sanding of the Variera's body, I used plastic spray filler to further refine and improve the surfaces. I first started with the body I got from Koenigsegg since it was printed in resin, and I had heard resin was a lot better than normal 3D-printed plastic when it came to models.

But the body had warped in places like the sides and had blobs on the surfaces, which I tried to sand away. However, since the shell was so thin despite the plastic filler spray, I didn't want to risk wasting both time and resources on this part only for it maybe not even to fix the surfaces and warping or even breaking. This led me to focus on the backup print from the school of the Variera's body.

PHYSICAL MODEL

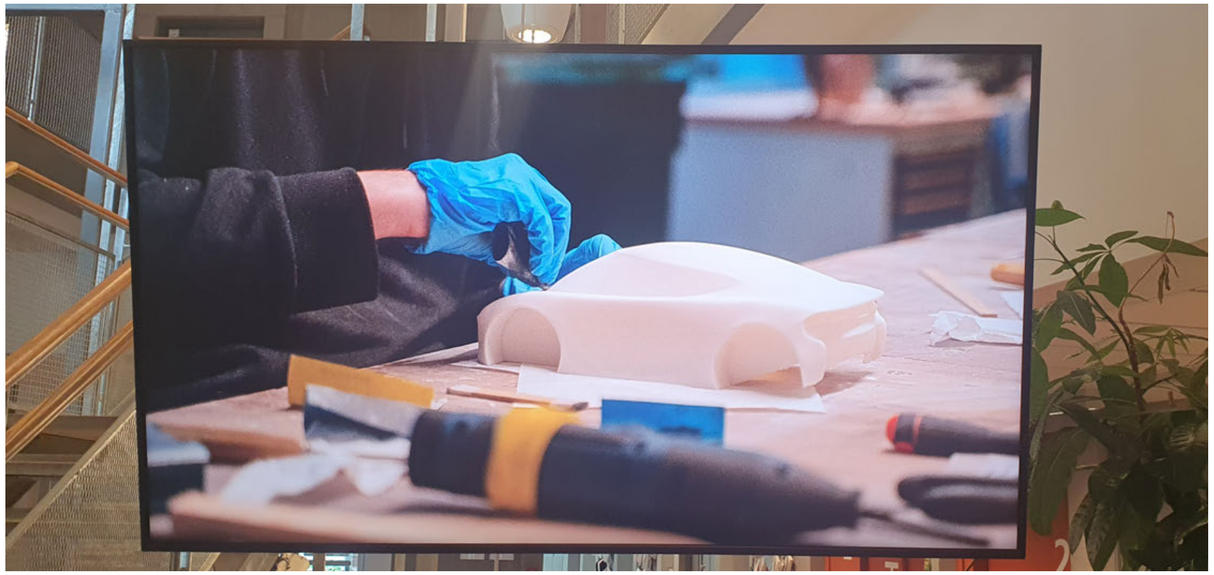
When I switched my focus to the backup print of the Variera's body, I had changed the insides to give it a solid interior, which meant it had to be printed with a lot of support material to ensure that it wouldn't warp or move during the print since it's a large piece. Since this part was printed at the school, it wasn't printed in resin, which made the process of getting the surface nice longer.
Once all the support material was gone, I sanded the surface hard and fast to help the plastic filler spray stick better to the surface. I also stuffed the areas where I didn't want added volume, which could mess up fitment of parts when assembling the Variera—areas such as headlight holes, air intake holes, wheel arches/holes, and also the rear inset area where the rear lights would be placed.

PHYSICAL MODEL

Once the first coat of plastic filler had dried, I sanded from P80 rough to P400 smooth. Once I had achieved a nice enough surface for the first pass, I covered the same places for spraying again and added a new layer of plastic filler.

PHYSICAL MODEL

After repeating this process and getting a better and better surface with each pass of sanding, I eventually reached the last sanding pass, which I first did dry and then used wet sandpaper to ensure a clean, refined surface for the painting process. During the final sanding, I had the chance to have the Koenigsegg Variera featured on the school's TV to promote the bachelor's and master's exhibition.

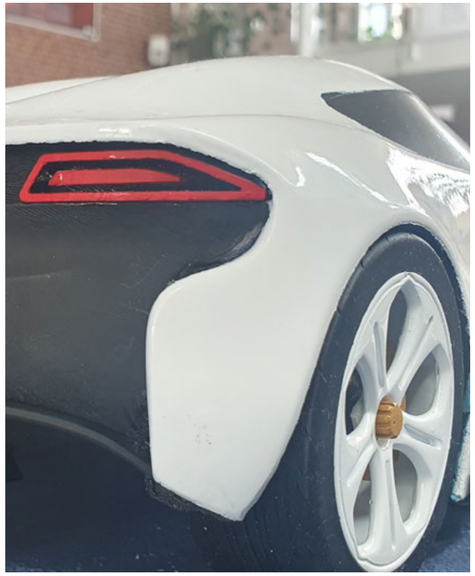


PAINTING THE MODEL

Once the model had been sanded and refined, I went to Brantviks Måleri in Malmö to get the model painted with similar colors to the digital version.
During this part of the process, it was hard to part with the model and give it to someone else, but it was also an important exercise in trusting others with their specialty. The reason I didn't paint the model myself was that, since it was a collaboration with Koenigsegg, I didn't trust my skills enough to both mask and paint such a model. I didn't want to risk it looking weird, especially since it was also my bachelor's degree project, and I wanted the best result possible on a student budget.

FINAL MODEL

After the model had been sanded and sent over to Brantviks for painting, I got it back after one week. I then started assembling the parts, such as wheels, brake discs, brake calipers, front and rear lights, and carbon fiber aero pieces.
The colors I chose for the physical model matched the digital version, since for the exhibition I would have a poster with renders of the digital version as well as a 360-degree rotating animation of the Koenigsegg Variera. This way, the physical model's colors would blend the digital and physical spaces well.



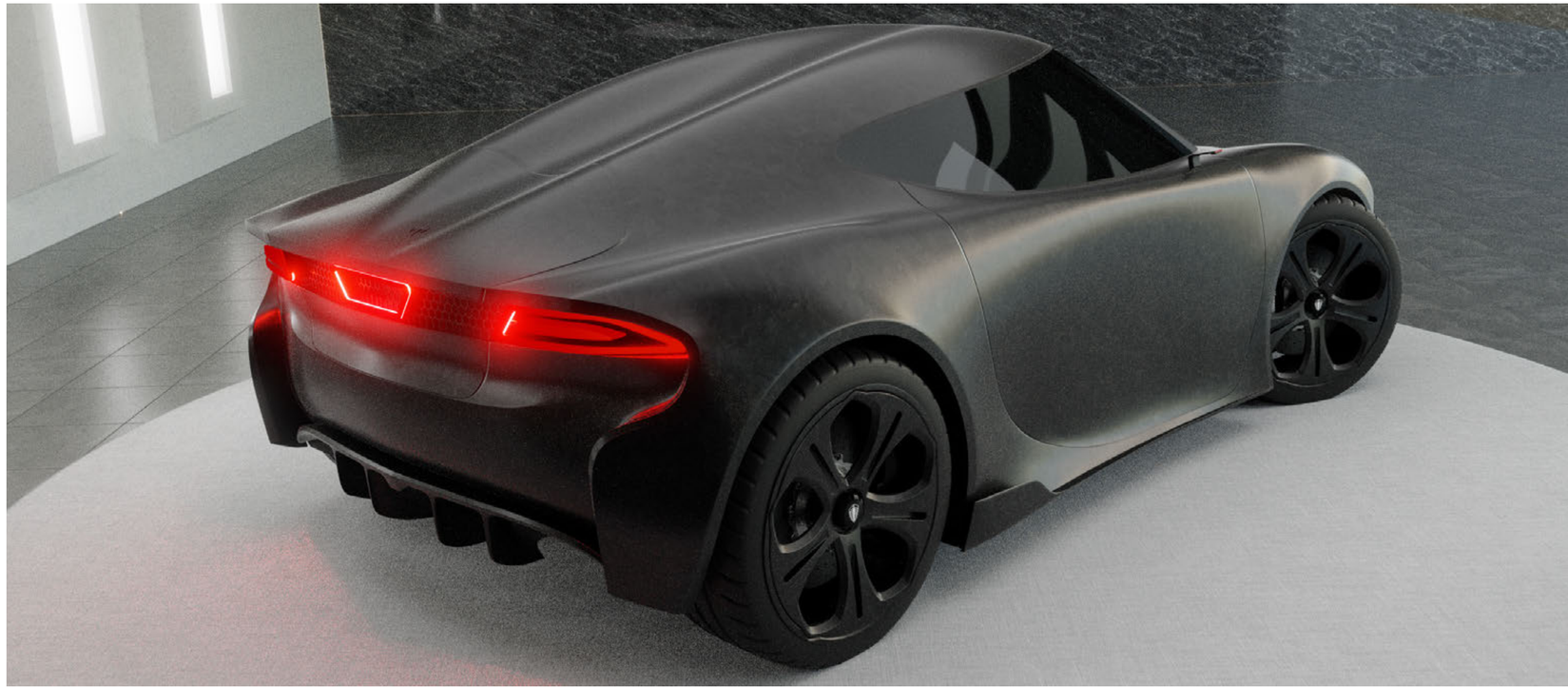
RENDERS

DAYTIME LIGHT DESIGN

NIGHTTIME LIGHT DESIGN

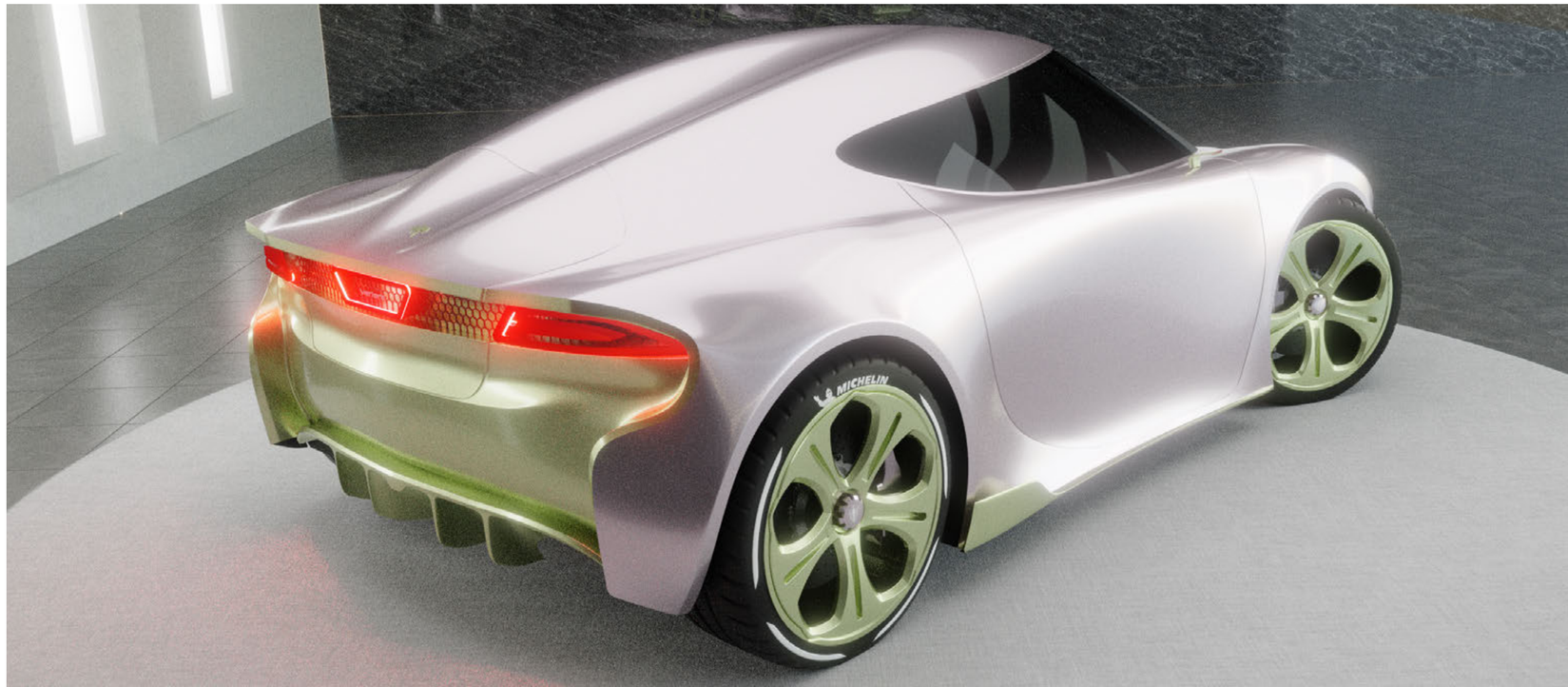
CONFIGURATION DESCRIPTION 1

“I want it murdered out and make that shit look like something batman would drive.”



CONFIGURATION DESCRIPTION 2

“I want it more metallic and shiny. Give it a nice color on the dark carbon bits, like a metallic green or something—kind of like the Ferrari Verde Kers Lucido green. Also, give me tire lettering, but only on the rear tires so it looks cool during burnouts.”

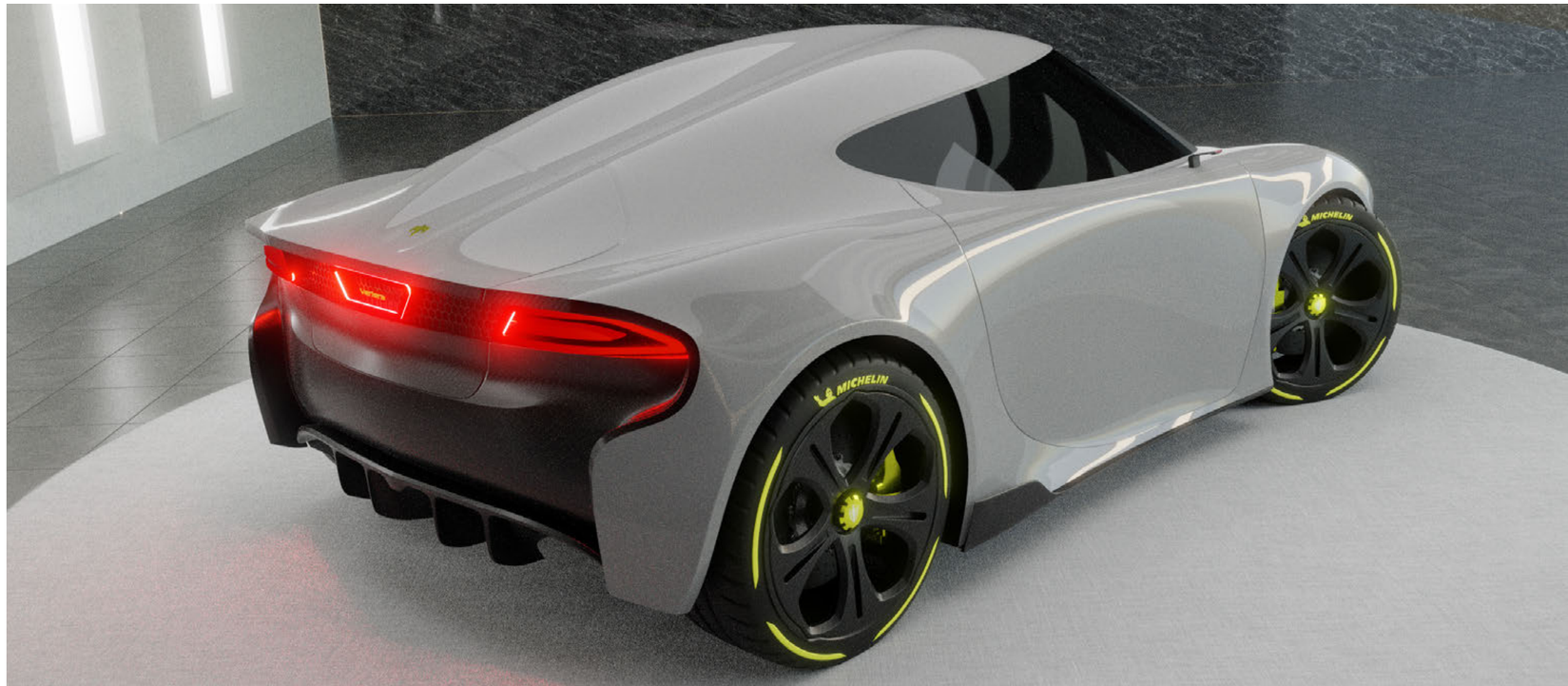


CONFIGURATION DESCRIPTION 3

“I love the orange Jesko pics on Instagram, so I want mine in a nice glossy orange with black carbon bits and black badges for a nice contrast. Also, get me some silver wheels instead, and keep the rear tire lettering.”

CONFIGURATION DESCRIPTION 4

“Can you make it look similar to the Gemera concept with the grey and yellow colors? Keep the black carbon bits, but add the grey color and make it glossy. Then add yellow tire lettering, badges, brake calipers, etc., and call it Gemindre.”

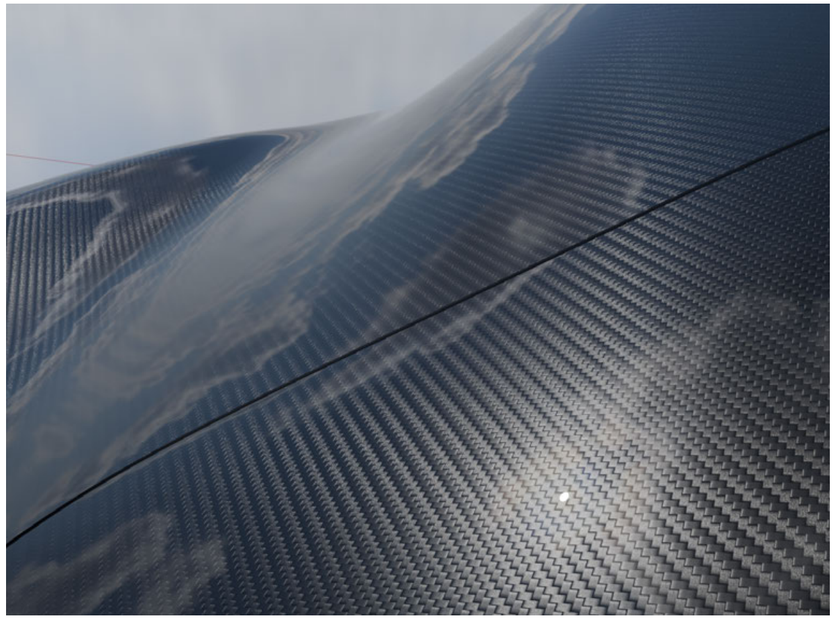


MY VARIERA CMF OPTIONS

Glossy White
Main body color

Satin finished orange
Badges, calipers etc

Glossy carbon fiber
Aero elements and visual lightness

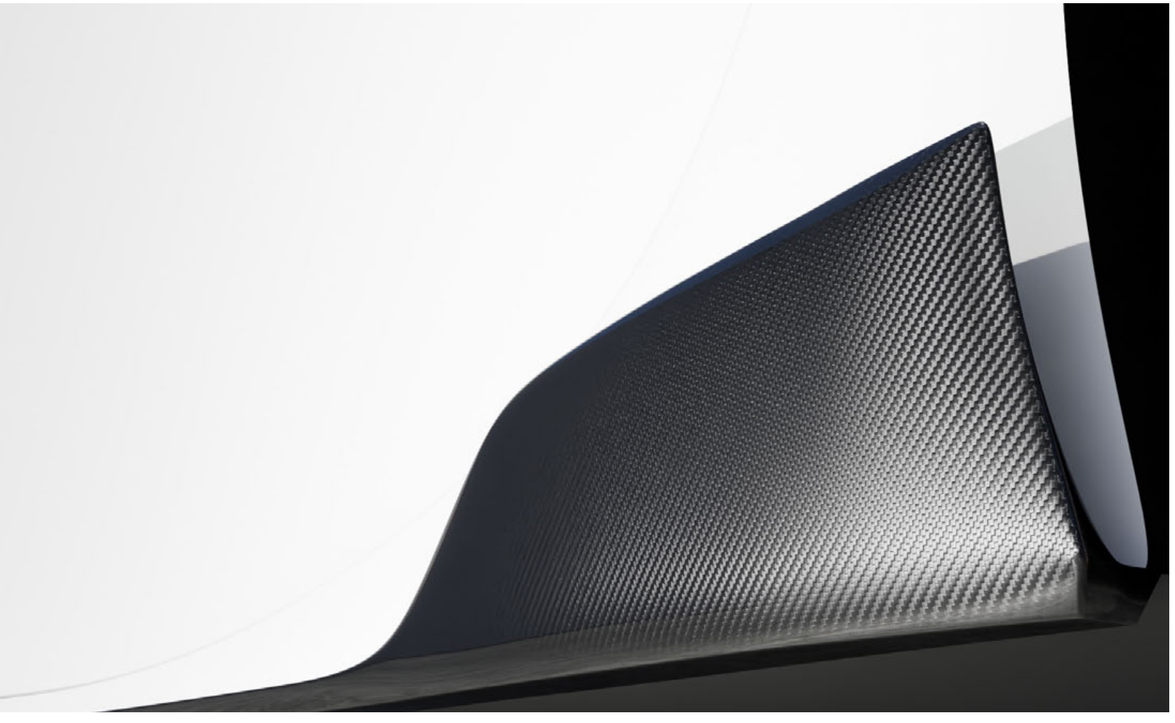



MICHELIN

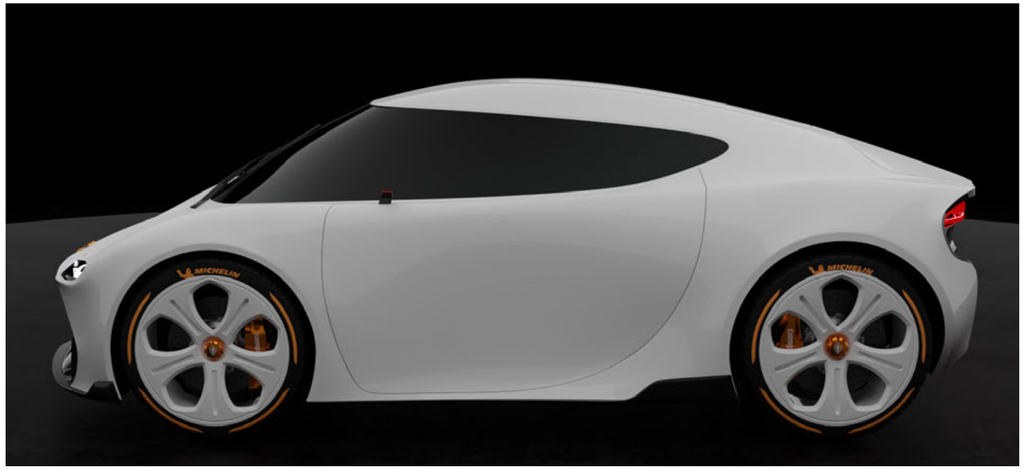

Variera
MICHELIN


MICHELIN
MICHELIN


Koenigs



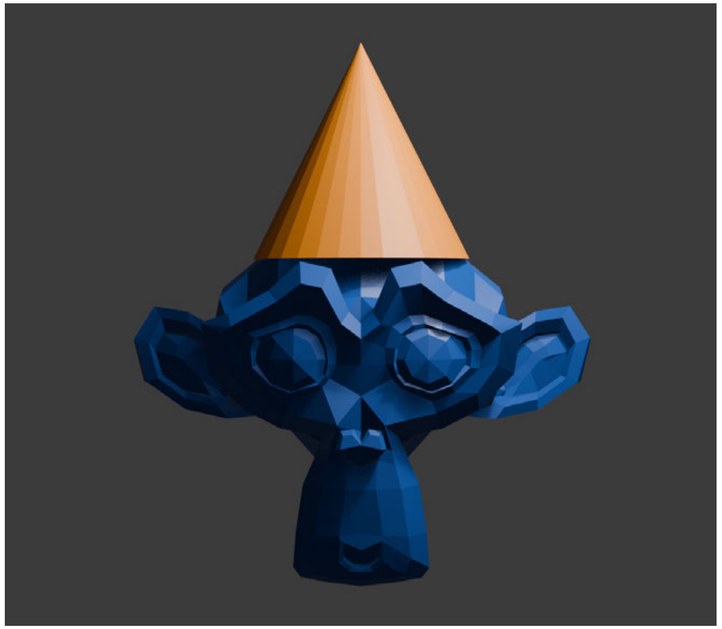

MICHELIN

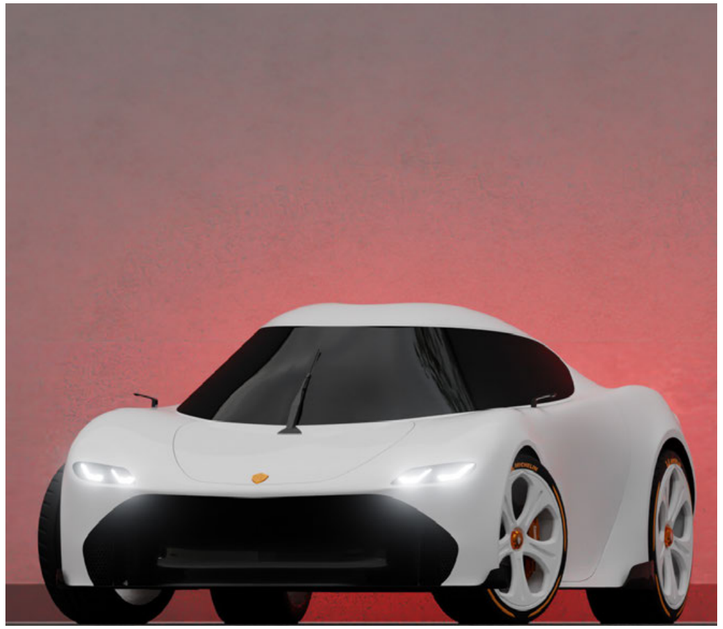

MICHELIN


MICHELIN
MICHELIN


MICHELIN
Koenig


Variera





Digital

- Blender

- Surface modelling

- Rendering

- UV un/wrapping/mapping

- Surface understanding

- Texturing

- Full 3D car design

- Topology is king

- Asset gathering

- Scaling

Process

- Don't jump the gun

- Adapt the design process after personal strenghts

- Take time to understand, dont try to rush it

- Focus on whats most important (time managment)

Life

- Take breaks.

- Go for a walk.

- Talk to people for help (most blender people are super nice it turns out).

- Get plenty of sleep dont try to 24/7 it.

- Gather as much information from profesionals within the industry as you can, especially if it's in person.

- Don't give up even if the current situation sucks.

Koenigsegg support:

Massive thanks to Oscar Dülow at Koenigsegg, who responded when I reached out and was super friendly and open to the idea of collaboration. He gave me a great tour around the factory, allowing me to get inspired and get up close to automotive icons. He was also a great mentor during the project, providing super valuable feedback and helping me print my parts for the physical model at Koenigsegg.

Academic support:

I would like to sincerely thank my supervisor, Charlotte Sjödell, for her amazing support and guidance throughout this project. Especially for an automotive project, her straightforward honesty—never sugarcoating things—was invaluable and always proved to be spot on. Most importantly, her vast network and connections, including those to Koenigsegg, were crucial in making this incredible collaboration possible.

Technical support:

A huge thanks to Olof and Phil for their invaluable help during the 3D-printing preparation process—their time, patience, and willingness to tackle challenges along the way made a big difference. Also, a shoutout to the 3D-print lab crew who I constantly bombarded with parts.


MICHELIN
MICHELIN

SOURCES

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Lidar system:
https://medium.com/@BabakShah/lidar-in-self-driving-cars-cee29db94af7
https://waymo.com/waymo-driver/

Radar system:
https://www.bosch-mobility.com/en/mobility-topics/automated-driving-sense-think-act/sense/

AI USE

Vizcom: Interior generation examples

Chat GPT and LeCHat: Used for grammar checking.