



IDC School of Design
अभिकल्प विद्यालय



Design Project III

Fashion Inspired Personal Mobility for a Future Urban Scenario

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Declaration

I declare that this written submission represents my ideas in my own words and where others ideas or words have been included, I have adequately cited and referenced the original sources. I also declare that I have adhered to all principles of academic honesty and integrity and have not misrepresented or fabricated any idea/data/fact/source in my submission. I understand that any violation of the above will be cause for disciplinary action by the Institute and can also evoke penal action from the sources which have thus not been properly cited or from whom proper permission has not been taken when needed.

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Mohammed Jaseel
Date: 28-06-2023

Approval Sheet

This Mobility & Vehicle Design Project III titled 'Fashion Inspired Personal Mobility for a Future Urban Scenario' by Mohammed Jaseel PK is approved in partial fulfillment of the requirements for Master of Design Degree in Mobility & Vehicle Design, IIT Bombay.

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Abstract

This project explores the concept of redefining personal mobility as a fashion accessory in the future. It delves into the intersection of fashion and transportation, examining how style and self-expression can play an integral role in the design of mobility solutions. The report discusses the importance of fashion in society, its historical significance, and its evolving trends. It also highlights the current status and future prospects of personal mobility, including modes such as motorcycles, cars, bicycles, and emerging trends in compact electric vehicles. The project further explores how fashion and style will become an essential aspect of personal mobility in the future, considering the evolving needs and desires of consumers. It examines the potential collaborations between mobility and fashion brands, showcasing how partnerships can result in innovative and stylish transportation solutions. Additionally, the project discusses the concept of hyper-personalization in products and services, envisioning a future where individuals can customize and personalize their mobility choices to reflect their unique style and preferences.

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Methodology

The methodology employed in this report involves a comprehensive approach to examining the intersection of personal mobility and fashion as a means of redefining mobility devices as stylish wearables. Firstly, extensive research will be conducted by reviewing relevant literature, industry reports, and online resources. This research will provide a foundation of knowledge regarding current trends, emerging technologies, and consumer preferences in both the personal mobility and fashion industries. To gain practical insights, case studies of successful collaborations between mobility brands and fashion brands will be analyzed. This analysis will focus on understanding their design strategies, approaches, and outcomes, with an emphasis on fashion-forward mobility products. Furthermore, a technology assessment will evaluate emerging technologies that can enhance the style, functionality, and safety of wearable mobility devices. Market analysis will assess the market potential and business opportunities for OEM automakers in producing fashion-forward mobility products. Future scenarios will be developed based on industry trends and insights, envisioning the potential evolution of personal mobility as a fashion accessory. These scenarios will take into account factors such as sustainability, personalization, and cultural shifts in fashion and mobility industries.

1. Introduction

The intersection between personal mobility and fashion is an intriguing and exciting area of design study, with the potential to fundamentally alter how we view and interact with our modes of transportation. The idea of incorporating personal mobility devices smoothly into the world of fashion as accessories gives intriguing potential in a fast changing culture where individual expression and style hold important importance.

Bicycles, motorbikes, scooters, and vehicles are examples of personal mobility equipment that can be used as practical transportation instruments. Aesthetics are a key component of modern personal mobility products, but personalization is not. Instead, they are frequently seen as a medium of transportation first and a mode of expression second. Contrarily, the fashion industry has been a vibrant and significant field that has allowed people to express their individuality, creativity, and personalities. This paradox poses an intriguing problem: how can personal mobility be changed from a practical instrument into a stylish addition that not only accomplishes its function but also improves personal style?

The goal of this project is to investigate and delve into the idea of personal mobility being redefined in the future as a fashion accessory. We aim to imagine a future where personal mobility devices seamlessly merge with fashion, becoming an integral part of an individual's personal style and self-expression. To do this, we will analyse the current state of personal mobility devices, examine emerging trends and technologies in both personal mobility and fashion, and take user needs and preferences into account. We have the chance to reshape our urban environments, redefine personal expression, and contribute to a more fashionable and sustainable future by reinventing personal mobility as a fashion item.



Fig 1

2. Fashion

Through history, the dynamic and ever-changing phenomenon of fashion has had a tremendous impact on human culture. It allows people to communicate their identities, aspirations, and cultural affinities and is a potent form of self-expression. Beyond its outward appearance, fashion has a significant impact on social dynamics, economic systems, and even the environment. We can learn a lot about the transforming potential of fashion and its long-lasting significance by investigating its past and its projected future. The origins of fashion can be found in prehistoric societies, where social class, line of work, and religious affiliation were all expressed through clothes. Fashion has changed over time to reflect changes in ideals, beliefs, and technology, as well as societal developments. Fashion has continuously reflected and contended with prevailing standards and ideas, from the luxurious attire of royal palaces to the revolt of counterculture movements.

We expect more advancement and growth in the fashion industry as we move to the future. Wearable technology, smart fabrics, and virtual reality experiences are just a few of the exciting ways that technology and fashion will continue to converge. The idea of "fast fashion" might change as consumers seek more transparency, ethical production, and durability. With the ability to co-create and mould their clothing, personalization and customization will become essential to the fashion experience.



Fig 2. Dress sprayed onto model on Coperni catwalk at Paris Fashion Week

2.1. Future of Fashion Industry

Technological breakthroughs, shifting consumer habits, and rising sustainability concerns are all expected to significantly impact the fashion business in the future. Several significant factors that will affect how the fashion business develops include:

Sustainability and ethical practises: The fashion industry is striving towards more sustainability and ethical practises as environmental and social challenges become more prominent.

Technology and digitalization: The fashion industry is utilising technology and digitalization in a variety of ways. The shopping experience is changing as a result of virtual reality (VR), augmented reality (AR), and mixed reality (MR), which enable customers to try on clothing digitally and customise their selection (Fig3.).

customisation and Personalization: The fashion business is going towards customisation and personalization as a result of the growth of e-commerce and improvements in manufacturing technology. More and more buyers are looking for specialised goods that fit their interests. To offer customised apparel, footwear, and accessories, brands are utilising technology like 3D printing and made-to-order production techniques. Another technology adding to personalisation is spray on clothing showcased at Paris fashion week (Fig 2).

Diversity, inclusivity, and body positivity are topics that are increasingly being highlighted in the fashion business. Customers want diversity and representation in advertising campaigns, fashion displays, and size ranges. Brands are broadening the range of products they sell to accommodate people with different body types, skin tones, and cultural backgrounds in an effort to promote inclusion and celebrate uniqueness.

Resale and Rental Market: The resale and rental market is expanding in the fashion sector. Due to their growing awareness of the negative environmental effects of fast fashion, consumers are switching to secondhand stores and clothes rental services. This fashion trend encourages a circular economy and increases clothing longevity,



Fig 3. Balenciaga Afterworld: Virtual Fashion Premier

Press P to take S

which reduces waste and encourages sustainable consumption. Globalisation and Emerging economies: The fashion business is still growing on a global scale, with important contributions coming from emerging economies like China, India, and Brazil. These markets provide a venue for cross-cultural interaction and fresh design ideas, as well as prospects for growth and innovation. In order to meet the unique preferences and requirements of different markets, brands are altering their tactics.

Digital influencers and social media: The fashion business has become very dependent on social media platforms. Bloggers, content producers, and other digital influencers have a big impact on how trends and consumer preferences are shaped. Social media platforms are being used by brands for marketing, influencer partnerships, and direct customer engagement, enabling more direct and individualised connections.



Fig 4. BMW Vision Amby

3. Personal Mobility

Personal mobility, which includes a variety of forms of transportation, is essential for allowing people to get around in their daily life. Currently, a variety of frequently utilised personal mobility options include:

Cars: One of the most popular and adaptable forms of private, individual transportation is the car. They provide door-to-door convenience, making it possible for people to travel in comfort and carry passengers or freight as needed.

Motorcycles: Motorcycles offer a more flexible and manoeuvrable form of personal mobility, making them ideal for single riders or small groups of people. They provide a fun and effective way to travel short- to medium-distances while handling traffic. Standard street bikes, cruisers, sport bikes, and adventure bikes are all types of motorcycles that may accommodate various riding styles.

Bicycles: Cycling is a common form of personal transportation, particularly for short- to medium-distance travel and city commuting. They provide a healthy and environmentally beneficial alternative by encouraging physical activity and reducing carbon emissions. Both conventional bicycles and electric bicycles (e-bikes), which offer assistance through electric motors, are commonly used.

Electric skateboards, hoverboards, and electric unicycles are a few examples of small, lightweight personal electric vehicles. They provide entertaining and quick transit options, especially in metropolitan areas, for shorter distances.

RVs offer a distinctive form of private personal mobility for tourists and outdoor enthusiasts. Motorhomes offer a combination of transportation and lodging for long journeys or road excursions, and range from motorhomes to campervans and travel trailers.

3.1 Fashion in Personal Mobility

In the future, fashion and style are anticipated to have a bigger impact on personal mobility. Personal mobility can be reimagined as a fashion accessory, reflecting unique style and expression, as the lines between fashion, technology, and transportation become more hazy. A higher level of personalization will be available in personal mobility cars and accessories as manufacturing technologies progress. The design, colours, materials, and finishes of people's cars can be customised, giving them a distinctive appearance that matches their particular style choices.

Fashion and functionality will be seamlessly integrated into upcoming personal transportation systems. Designers can produce cutting-edge cars and accessories that not only fulfil transportation requirements but also improve personal style. The focus will be on adding stylish aspects while maintaining safety, ergonomics, and performance. Personal mobility fashion will increasingly incorporate wearable technology. Smart clothing and accessories will incorporate technology including sensors, communication tools, and display systems to improve connectivity, safety, and navigation. Users will be able to access information, manage settings, and interact while moving about thanks to these stylish wearables that will mix in perfectly with personal mobility vehicles.

In conclusion, the future of personal mobility will place a greater emphasis on style and fashion. Personal mobility will be reimagined as a fashion item through the merging of fashion, technology, and transportation, enabling people to express their individual tastes and styles while on the go. Personal mobility will become an extension of individual style and self-expression thanks to the integration of customised design, wearable technology, sustainable fashion choices, and fashion-inspired safety gear.



Fig 5. Jaguar XE X Stella Mccartney



Fig 6. BMW CE 02 Concept

4. A 2040 Consumer Scenario

The way people interact with the world around them will be revolutionised by hyper personalization, which will deliver customised experiences that take into account each person's own preferences, requirements, and aspirations. People are now able to exhibit their distinct personalities through highly customised items thanks to hyper-personalization. Every object, from apparel and accessories to cars and technology, can be customised to a person's preferences, enabling unmatched self-expression and a closer bond with the things we use every day. The following are likely to be some of the most significant events and circumstances in 2040:

- A large percentage of population has moved to urban areas
- Fossil fuel based vehicles are completely banned,
- EVs are the norm
- Customized online educational degree programs
- Gender fluidity is very popular and almost all products focus on gender neutral designs
- Hyperconnected and autonomous drive systems have become norm in major cities
- Every product has to oblige with sustainability regulations mandated by governments
- Culturally and ethnically diverse families
- high expenditure on non- tangible products
- Every possible product is a smart connected device with continuous data sharing
- Physical stores are almost obsolete. Everything is online



Fig 7.

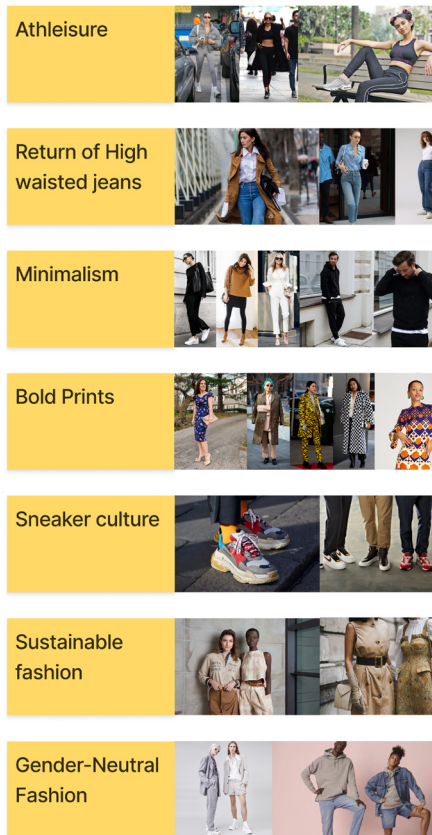


Fig 8.

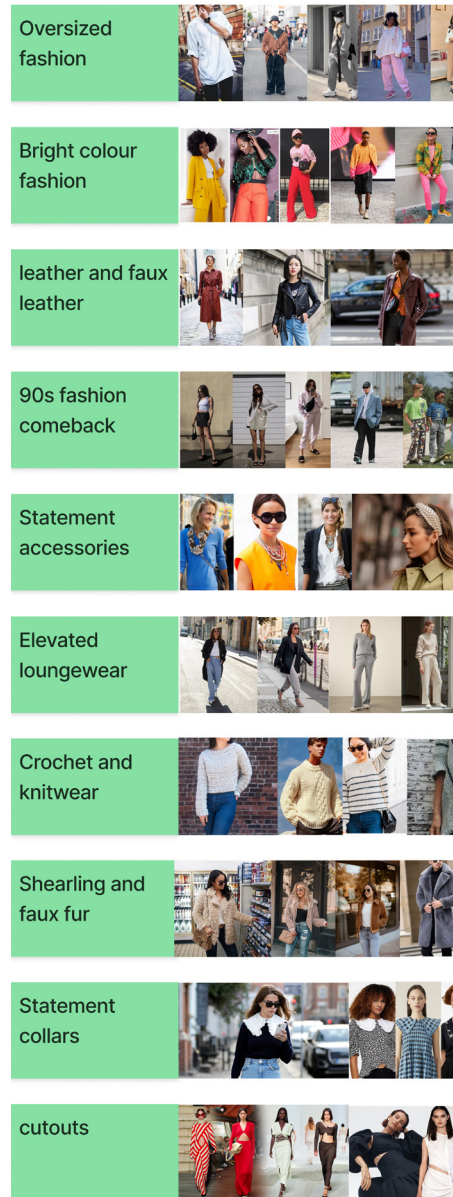


Fig 9.

5. Types of Fashion

The fashion industry has experienced a number of trends over the past ten years that have influenced the way we dress and express ourselves. Some prominent ten-year-old fashion design trends are: (Fig 8.)

Athleisure: With the emergence of athleisure, sportswear-inspired clothes entered the mainstream. Leggings, joggers and trainers became fashion essentials thanks to athleisure, which combines comfort and style.

Sustainability and eco-friendly fashion: As the importance of sustainability increased, eco-friendly fashion grew in popularity. Designers and companies began combining ethical standards, slow fashion, and repurposed and organic materials.

Influence of streetwear: Streetwear dominated the fashion industry and merged urban and high fashion. Contemporary fashion became heavily influenced by larger shapes, graphic t-shirts, sneakers, and hoodies.

90s nostalgia: 1990s fashion fads are making a big comeback. This comprised grunge-inspired fashion components, slip dresses, chokers, denim dungarees and oversized denim jackets.

Sustainability and ethical conduct: The fashion business has come under growing scrutiny for its effects on the environment and hiring procedures. This resulted in a rise in ethical and sustainable fashion practises, such as upcycling, fair trading, and supply chain transparency.

Statement Logos and branding: Designers prominently displayed their logos on garments and accessories as part of a logomania that swept the fashion industry. Bold branding has come to represent individuality and prestige.

Social media and other digital platforms have grown dramatically, which has had a big impact on fashion trends. Influencers and



Fig 10.

famous people were crucial in influencing consumer choices and fostering the fast fashion culture.

Oversized Silhouettes: The idea of fitting clothing has become less common as loose and oversized silhouettes have gained appeal. Comfort was emphasised in this style, which also embraced a more unforced and carefree appearance.

Among the most popular newly introduced fashion trends are: (Fig 9).

Sustainability and Slow Fashion: The emphasis on ethical and sustainable fashion has increased. Customers are choosing labels that prioritise sustainability, such as employing organic fabrics, upcycling, and supporting fair labour practises, since they are more aware of the environmental impact of their clothing choices.

Fashion that is genderless: Gender-neutral or genderless fashion has gained popularity as designers straddle the traditional gender binary. The shapes and designs of clothing are being developed to be inclusive, to embrace flexibility, and to allow people to express themselves without adhering to predetermined gender norms.

Bold Prints and Colours: Vibrant, strong colours are returned, bringing excitement and vitality to fashion. There has been a rebirth of happy and expressive designs, from neon hues to striking prints like animal prints, tie-dye, and floral patterns.

Retro and vintage influences can be seen in the rebirth of vintage-inspired fashion, which pays homage to the '70s, '80s, and '90s. Retro components like flared pants, puffed sleeves, vintage designs, and sentimental accessories have returned to the mainstream of fashion.

Clean, minimalist aesthetics continue to remain popular, emphasising clear lines, straightforward forms, and subtle elegance. Streamlined designs, neutral colour schemes, and monochromatic clothing produce a timeless and elegant appearance.

Sustainable footwear solutions have gained popularity as businesses concentrate on using environmentally friendly materials and manufacturing processes. Conscious shoppers are increasingly looking for recyclable materials, ecological shoe options, and vegan leather substitutes.

NFTs and Digital Fashion: The emergence of non-fungible tokens (NFTs) and digital fashion has opened up new avenues for artistic expression. Collectible digital fashion items and virtual fashion, where designs only exist in the digital realm, have acquired popularity at the nexus of fashion and technology.



Fig 11.

5.1 Fast Fashion

With its extraordinary speed in providing consumers with fashionable and reasonably priced clothing, fast fashion has established itself as a dominant force in the clothing market. Fashion lovers can keep up with the newest trends without going broke thanks to its rapid manufacturing cycles. However, there are a number of worrying issues that are receiving more attention behind the attractiveness of quick fashion.

Fast fashion's detrimental effects on the environment are just one of its many downsides. Because of the constant desire for new garments, there is enormous production, which uses up a lot of energy and materials. Fast fashion has a negative impact on the environment due to the usage of synthetic materials and chemical dyes, which also cause air and water pollution and greenhouse gas emissions. In addition, the fast fashion model supports a disposable apparel and overconsumption culture. Consumers are driven to buy new products frequently due to the rapid change in fashion, frequently tossing out perfectly wearable clothing in the process. The bulk of fast fashion items are constructed from low-quality, difficult-to-recycle fabrics, which contributes to the growing problem of textile waste.

We have the ability to influence change in the fashion business as customers. We can work towards a fashion sector that is both fashionable and responsible, where the well-being of people and the earth are given the significance they deserve, by making informed decisions, supporting sustainable alternatives, and lobbying for greater openness and responsibility.



Fig 12. Humans: Digital Fashion collection by Joshua Why

5.2. Digital Fashion

The rapidly developing trend of “digital fashion,” often referred to as “virtual fashion” or “digital couture,” has the potential to completely alter the fashion business. It blurs the lines between fashion, technology, and art through the production and consumption of apparel and accessories that are only available digitally. Digital fashion has become increasingly popular recently, and it has a bright future. The sustainability of digital fashion is one of its main benefits. Digital fashion offers a more environmentally friendly alternative as the fashion industry struggles with the effects of traditional garment manufacture. It reduces waste and carbon emissions connected with traditional fashion production by doing away with the need for physical materials, manufacturing procedures, and shipping. Digital clothing can be made, distributed, and enjoyed without using up limited resources or adding to the issue of textile waste.

Additionally, digital fashion offers a platform for unrestricted innovation and self-expression. Unconstrained by the constraints of actual materials, designers can push the envelope in terms of shapes, textures, colours, and patterns.(Fig 12) They may create sophisticated and fanciful creations that defy the limitations of reality using cutting-edge software and 3D modelling. Beyond the constraints imposed by actual clothing, digital fashion enables people to explore and experiment with their particular style in a virtual environment. The appeal of digital fashion has also increased with the emergence of social media and online forums. Users can show their individuality and interact with others through shared virtual experiences by dressing their avatars or digital identities in stylish outfits. Digital fashion has the ability to democratise the industry by providing a platform for everyone to participate and express their creativity, regardless of their financial status or physical appearance. Despite the fact that digital fashion is still in its infancy, it has huge development and impact potential. We may anticipate that as technology develops, digital fashion will become more available, immersive, and incorporated into our daily lives. It has the potential to transform the fashion industry, alter how we view clothing, and open the door to a more inclusive, sustainable, and endless future for the industry.



Fig 13. Collusion Gender Neutral Collection

5.3 Gender Fluidity in Design

The term “gender fluidity in design” describes the dismantling of conventional gender standards and the adoption of a more open-minded and flexible approach to design. A rising understanding of the necessity for design to be more inclusive and representational of many gender identities has emerged in recent years. Fashion, product design, interior design, and graphic design are just a few of the design disciplines that have been impacted by this perspective change. Design professions are increasingly reflecting gender flexible design. The traditional gender-based fashions are no longer the only ones that designers are using to create apparel lines. Fashion that is gender-neutral or androgynous has grown in popularity. It includes shapes, patterns, and hues that anyone can wear, regardless of their gender identity.

The automotive industry’s long-standing gender preconceptions and expectations must be questioned and redefined in order to achieve gender flexibility. It involves removing the presumption that particular styles or features are only for men or women and constructing vehicles that appeal to a diverse spectrum of gender identities. No matter their gender, people can customise their cars in accordance with their preferences by offering a wide choice of customisation possibilities. This includes options for colour schemes, interior finishes, materials, and accessories, giving drivers the ability to design a car that matches their unique sense of style. Designing cars with comfort, safety, and individual expression as top priorities will enable all drivers to bond with their cars regardless of conventional gender stereotypes.

Design is moving in the direction of gender fluidity as society becomes more aware of and accepting of various gender identities. Designers are becoming more aware of the value of developing inclusive environments, objects, and experiences that appeal to people outside of conventional gender standards. Design becomes more approachable by adopting a more fluid philosophy, enabling people to express their actual selves and encouraging a sense of community among all.



Fig 14. BMW Motorrad Vision Next 100

6. Motorcycles as a style statement.

Motorcycles have long been associated with liberation, exploration, and revolt. Motorcycles are no longer just a means of transportation; they have evolved into fashion statements that combine flair, uniqueness, and a feeling of self.

almost like an accessory you could wear. they can serve as an extension of a rider's personality and sense of flair. Motorcycles can be a form of personal expression, much like accessories. Riders frequently pick a motorbike that complements their personalities and taste in fashion. Riders of motorcycles frequently consider their clothing choices and how they look in relation to their vehicle.(Fig 14) They might select particular motorcycle models or colours that go well with their riding attire, such as matching the paint job of the bike to the colour of their jacket or helmet. This emphasis on matching the motorcycle's appearance to clothing strengthens the idea that motorcycles are wearable accessories.

There is a physical connection between the rider and the motorcycle while riding. The posture, bodily motions, and even the motorcycle's sound and sensations all contribute to the entire experience. As the motorcycle becomes an extension of the rider's body, this close relationship might be thought of as a type of wearing the motorcycle.

Motorcycles now serve many purposes than just being a means of transportation, including serving as a fashion statement and accessory. Their significance as a fashion statement is a result of their iconic designs, customization opportunities, rider gear, subculture, association with adventure, and impact in popular culture. Motorcycles are a desirable option for those looking to exhibit their distinct sense of fashion because riding one allows one to embody a feeling of style, freedom, and self-expression.



Fig 15. Segway

7. Other modes of transportation with a personalised style factor

Other than motorbikes, there are a number of other forms of transportation that allow for personal style and expression. While traveling between locations, these types of transportation enable people to express their own tastes and preferences. Some are under production, while others are conceptual.

Longboards and skateboards: Longboards and skateboards are becoming common forms of mobility and means of expression. Skateboarders frequently add unique grip tape patterns, stickers, and artwork to their boards to make them more unique. While gliding over the streets, riders can express their personality and sense of flair through the selection of deck form, trucks, wheels, and graphic designs.

Self-balancing electric scooters known as hoverboards have grown in popularity among urban commuters and casual users. They provide a distinctive and cutting-edge method of transportation, frequently with sleek designs and eye-catching LED lights.

Segways: Segways (Fig 15 and Fig 16) are self-balancing personal transporters that offer a quick and easy way to get about cities. These gadgets have a distinct and contemporary look, with streamlined design and smooth lines.

Electric one-wheel boards, (Fig 17) like the Onewheel, provide a distinctive and exhilarating riding experience. Riders can easily carve and manoeuvre on these self-balancing boards, which mix snowboarding and skating aspects.

These small electric bicycles (eBikes), hoverboards, Segways, electric scooters, one-wheel electric boards, and electric unicycles are just a few instances of the wide variety of items available for fashionable and expressive mobility. with many patterns.



Fig 16. Segway Drift W1



Fig 17. Honda UNI-CUB



Fig 18. Honda BAIKU Unicycle concept by Nacho Alfonso



Fig 19. Yamaha Deus-Ex concept by Jake Loniak



fig 20. Wearable Personal Mobility Device by Bimal Rajappan



Fig 21. Acton R5 Rocketskates



Fig 22. Yettie by Roman Dolzhenko



8. Wearable Mobility Concepts

Wearable technology will be smoothly integrated with personal transportation in the future, enabling people to move about their daily lives with comfort and flair. These ideas examine how fashion, technology, and mobility intersect while providing creative transit options.



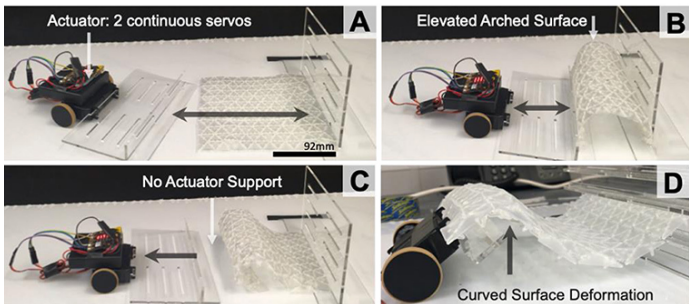
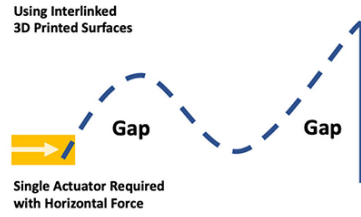
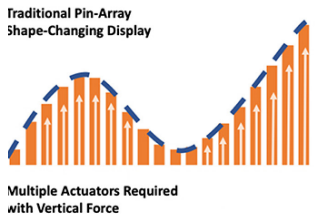
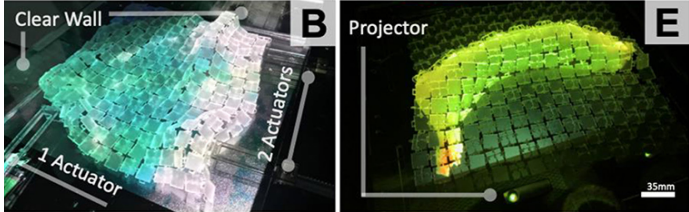
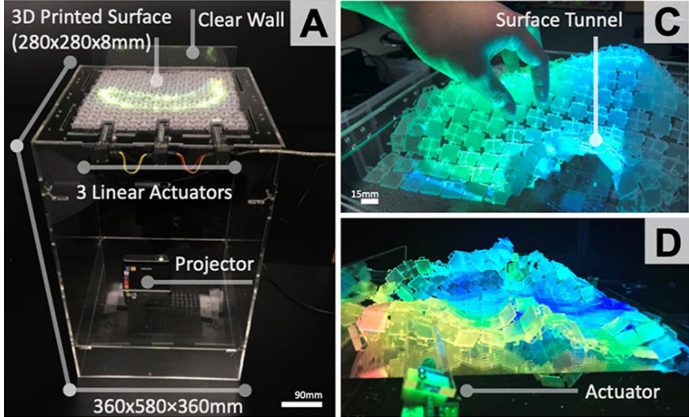
9. Mobility X Fashion: Collaborations

The worlds of fashion and mobility have come together in recent years thanks to a noticeable trend of collaboration between the two industries. The convergence of these sectors presents exceptional chances for brand collaborations and the creation of goods that appeal to consumers who are both fashion- and mobility-conscious. The cooperation between fashion houses and automakers is a well-known instance of industry cooperation between brands in the mobility and fashion sectors. In order to build unique editions of their vehicles that incorporate elements of high-end fashion, luxury car manufacturers have teamed up with well-known fashion designers. Limited edition vehicles with distinctive interior upholstery, special paint finishes, and accessories influenced by the fashion brand's aesthetic are frequently the product of these collaborations.

Mobility and fashion companies have worked together (Fig 23) on marketing initiatives and events in addition to tangible items. A dynamic mix of fashion and technology has been created as a result of fashion labels sponsoring and showcasing their collections at automotive and mobility sector events. These partnerships provide chances for brand visibility and cross-promotion, drawing a wide audience and igniting interest in both industries.

We can anticipate further cooperation between fashion and transportation firms in the future. There will probably be more emphasis on eco-friendly and sustainable transportation options that are also fashionable and fashion-forward as technology develops and customer preferences change. These partnerships could influence the direction of personal mobility by providing consumers with a variety of solutions that combine practicality and style.

Fig 23.

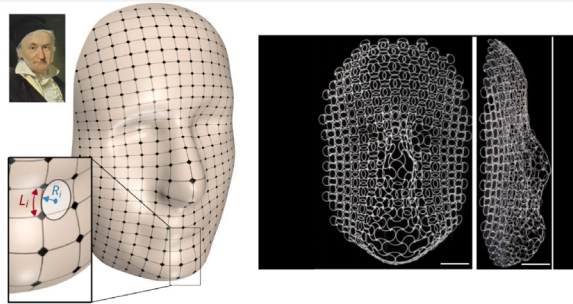


10. Dynamic Surface Technologies

Shapeshifting and dynamic surface technologies are quickly progressing areas that offer immense potential across multiple industries. These advancements enable objects and surfaces to modify their shape, structure, or visual characteristics in response to external triggers or user commands. They present exciting prospects for driving innovation, enhancing functionality, and elevating aesthetics.

MIT scientists made a shape-shifting material that morphs into a human face

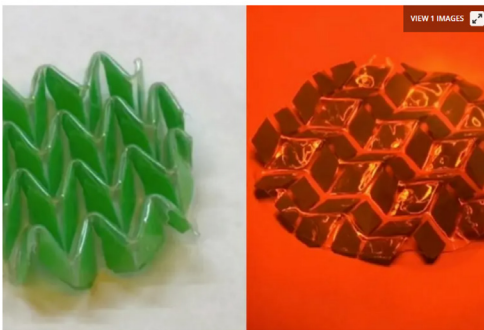
New method based on double-curvature effect described by Gauss nearly 200 years ago.



To showcase how the method creates a complex surface with multiscalar curvature, the researchers printed the face of the 19th-century mathematician Carl Friedrich Gauss, who discovered the double-curvature effect.

Shape-shifting material switches between forms in response to heat and light

By David Szeondy August 27, 2018



The new material transforms into complex, pre-programmed shapes. University of Colorado

NURBSforms: A Modular Shape-Changing Interface Prototyping Curved Surfaces.

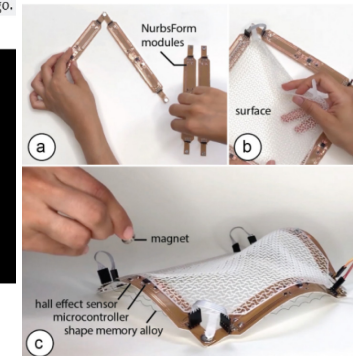


Table top by MIT designers ripples when people are nearby

f t p in t

Matt Hussey | 16 April 2014 | 3 comments

Milan 2014: designers from MIT Media Lab's Tangible Media Group have created shape-shifting table that reacts to human presence with a series of 1,000 tiny mo built into the frame (+ movie).



Fig 24.



Fig 25. Segway Ninebot S Scooter



Fig 26. Liger X : Self balancing scotter



Fig 27. Honda Ride Assist

11. Self - Balancing Technology

Electric scooters, hoverboards, and Segways may maintain balance and stability without the need for additional support or manual effort thanks to self-balancing technology. Fig (25-27) It continuously monitors and modifies the device's position to provide riders with a simple and seamless experience. Advanced sensors, control mechanisms, and actuators are at the heart of self-balancing technology. Together, these parts ensure that the apparatus stays upright even on uneven terrain or in the presence of outside disturbances. Gyroscopes and accelerometers monitor changes in motion and orientation and give the control system real-time data. After processing this data, sophisticated algorithms carefully modify the system's equilibrium. The electric motors or actuators, which are in charge of the machine's movement, are in communication with the control system. The self-balancing technology corrects any deviations from the required upright position by dynamically altering the speed and direction of these motors. Riders are able to maintain stability and control throughout their voyage because to this constant feedback loop.

11.1 Self - Balancing in lateral wheel configuration

The device will be equipped with multiple sensors, including gyroscopes and accelerometers. These sensors continuously measure the device's tilt, orientation, and acceleration in real-time. The control system sends signals to electric motors located in the wheels of the device. These motors are responsible for propelling the device forward or backward in the self-balancing mode to maintain an upright stance, to correct the imbalance, the control system adjusts the speed and power of the motors. For instance, if the device tilts forward, the motors in the wheels rotate faster, propelling the device forward. This corrective action brings the device back to an upright position.

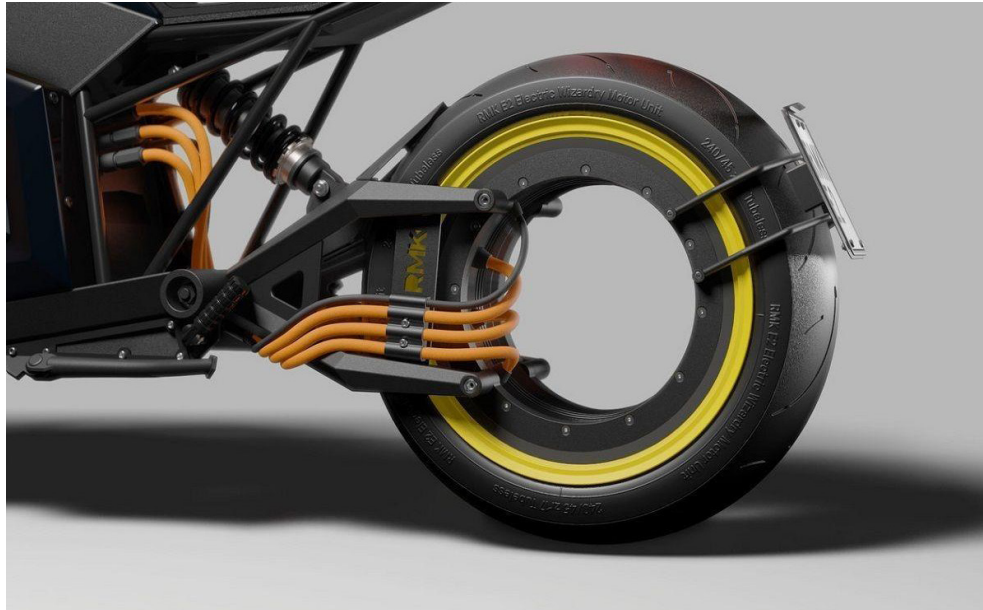


Fig 28. RMK E2 Concept



Fig 29. Verge TS Ultra

12. Hubless Wheels

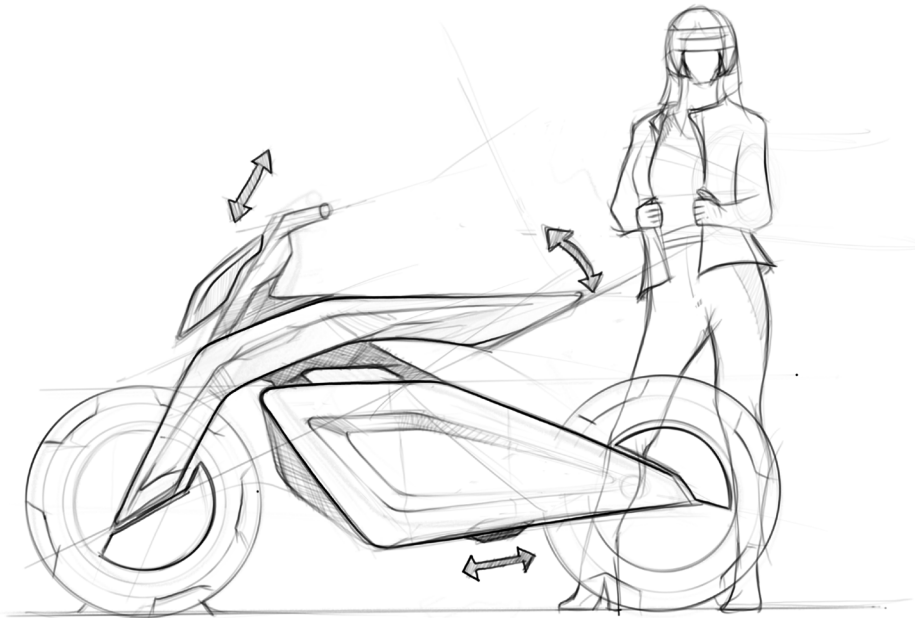
In hubless wheels, the axle or motor is integrated directly into the rim, resulting in a visually striking and futuristic appearance. (Fig 28 & Fig 29) Large central openings in the rim of hubless wheels give them a distinctive appearance. The wheel's structure relies on a combination of bearings and the axle or motor assembly that runs through the centre of the rim rather than spokes to join the rim to a central hub.

13. Product Brief

Design an electric urban mobility vehicle that not only serves as a practical means of transportation but also seamlessly integrates with fashion, being perceived as a wearable style accessory, allowing users to personalize and express themselves. The user should have the freedom to personalize their device to match their desired aesthetic that promotes individuality and creativity.

Must be features of the product should be :

- The design must maintain Gender neutrality in appearance, ie, the product should not look too masculine or feminine.
- The product should smart / AI capability to adapt to user mood and occasion
- The product should be electric with a range of 100 kms
- The product should be lightweight / agile and.
- The product should focus on modularity for design customisation by end user
- The product should enable personalization through dynamic colours and graphics
- The product should have variable ride height and postures for customisation and personalisation.
- The vehicle must be perceived in line with a wearable fashion accessory enabling self expression and personalization





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14. User Persona

- Age : 23
- Gender: Non-Binary
- Interests : Reading, Fashion, Workouts, Guitar, Muay Thai
- Location : Bengaluru
- Work : Event Planner

Basic Facts

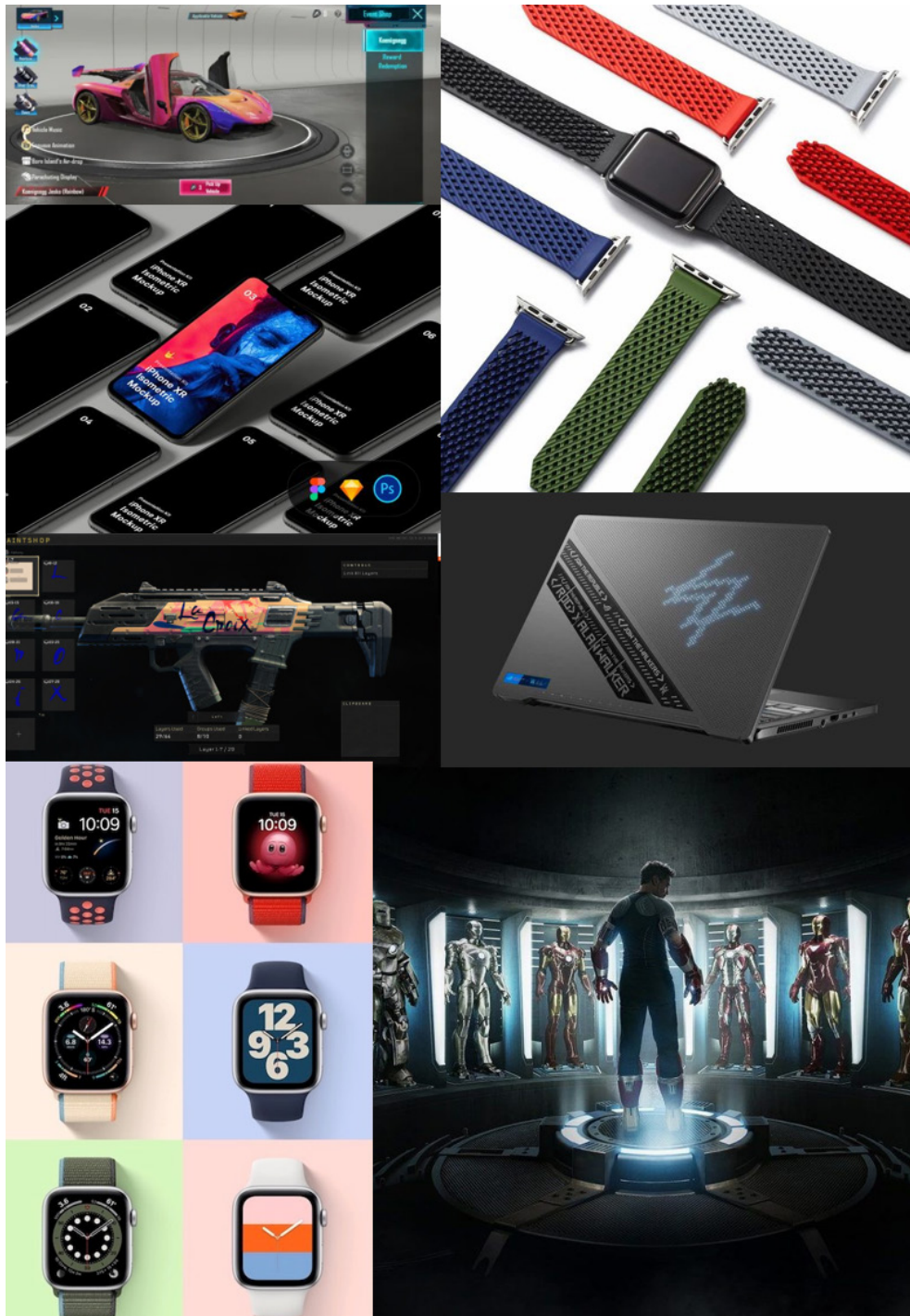
- Lives in a hyper personalized consumer market scenario
- High-tech lifestyle
- Social and extrovert
- High sense of Individualism and believes in self expression

Fashion and style

- Mostly casual dressing with layered clothing style
- Sometimes dresses to blend in and sometimes all out extra depending on mood and occasion
- Interested in wearing silver accessories like chain, rings etc.

Mindsets and values

- Most non-binary people dress to create an impression, confusion or to create an wow factor.
- Generally go for things that don't have place within binary system.
- Seeks to create their own career path and challenge traditional employment models
- Respects everyone's opinion and freedom to express
- Highly value diversity, inclusivity, and equality in all sectors
- Highly values sustainable and regenerative undertakings



15. Business Opportunities

Going into the market of mobility accessories as fashion accessories gives various interesting business options for an Original Equipment Manufacturer (OEM) automobile. Through in-app purchases and over-the-air updates, OEMs can continue to offer automobiles with distinctive designs depending on the newest fashions and events.

An OEM manufacturer can set itself apart from rivals in the mobility sector by creating mobility products that also function as fashion accessories. Fashion-conscious customers who appreciate both style and functionality in their mobility choices would be drawn to this special product. The legitimacy and appeal of the mobility gadgets can be increased by collaborating with well-known fashion companies. Co-branding, cooperative marketing initiatives, or even incorporating elements of high-end fashion into the design of the mobility gadgets are all examples of collaborations. Such partnerships can increase the client base by luring style-conscious buyers who would not have previously thought about a typical mobility gadget. Mobility device customization options give users the chance to exhibit their unique tastes and styles. Manufacturers of original equipment vehicles (OEMs) can create platforms or tools that let users customise their gadgets using a variety of design aspects like colour schemes, patterns, materials, and accessories. This strategy encourages a sense of ownership and an emotional bond, which boosts client happiness and loyalty.

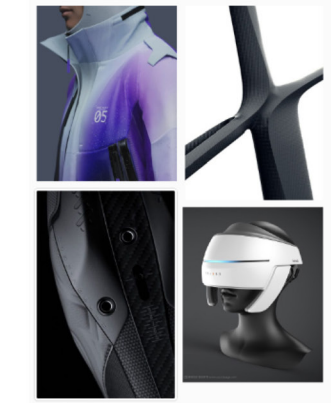
User can also have the capability to create their own unique designs through an app.

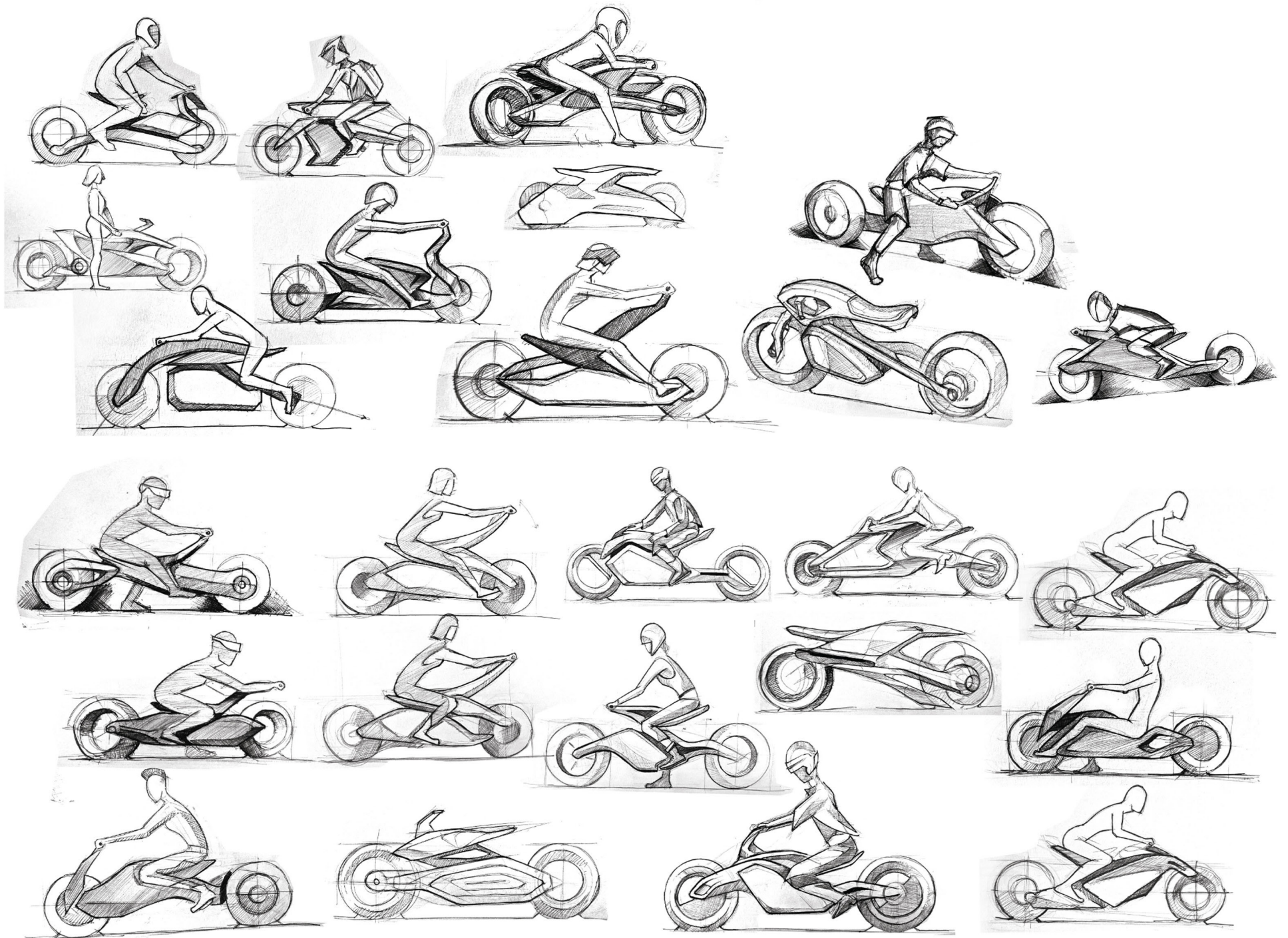
The whole product could be a subscription based service that allows users to have access to latest trends.

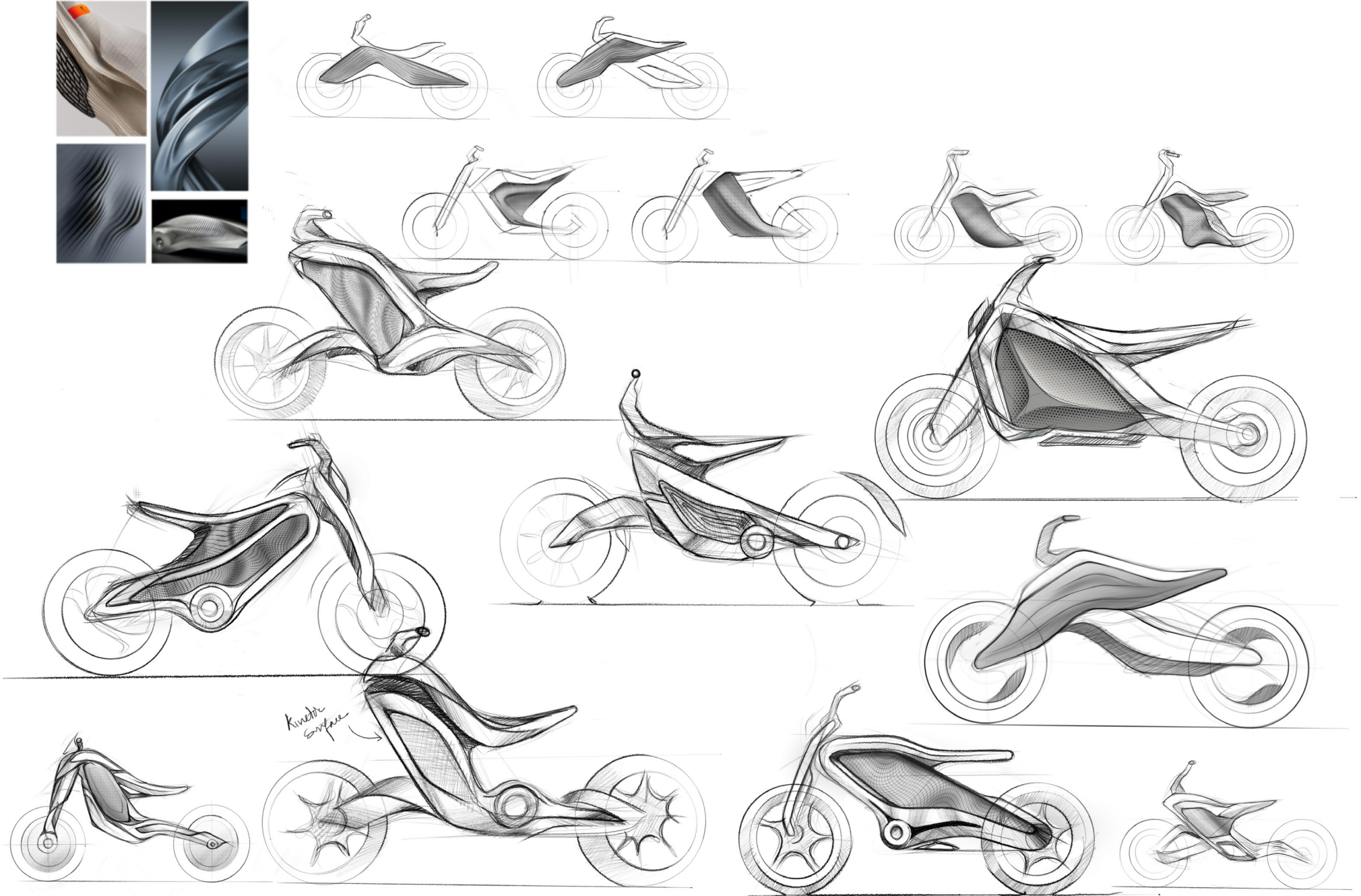
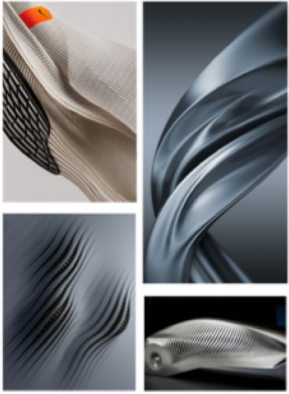
Give user access to a range of modular parts and accessories which will allow user to personalise the vehicle

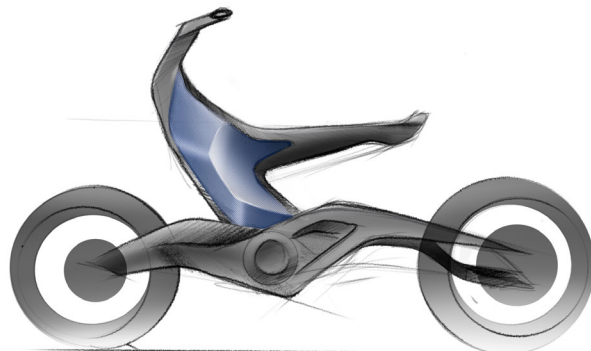
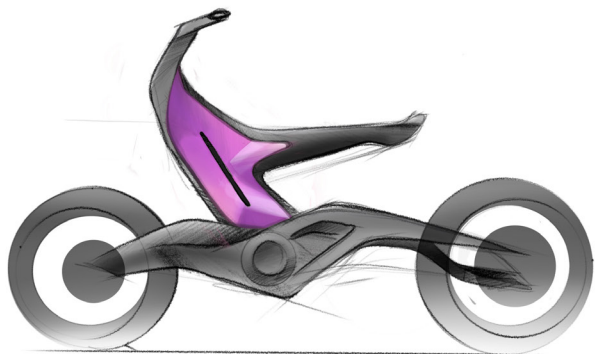
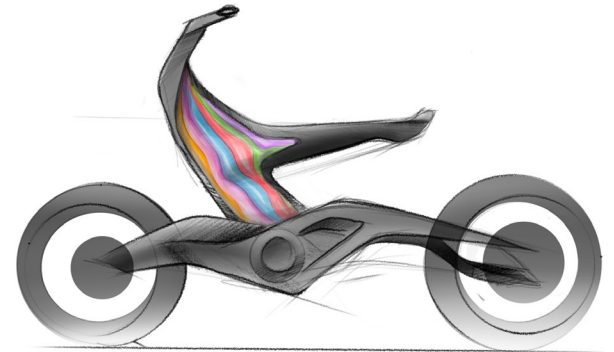
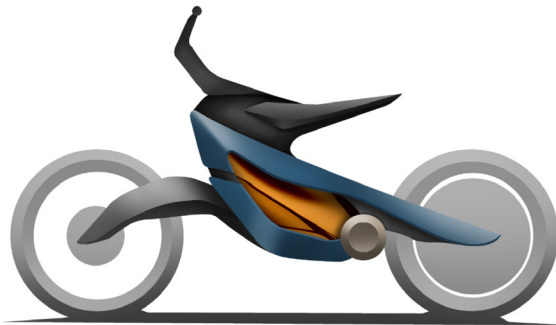
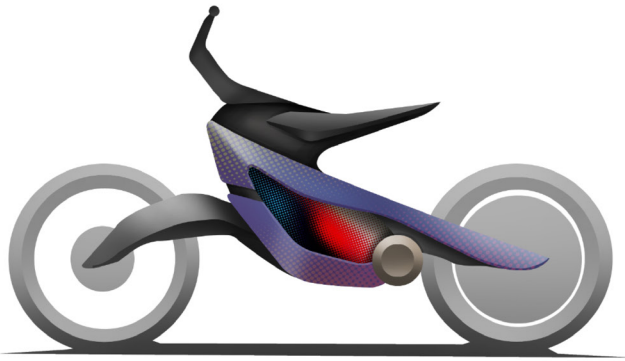
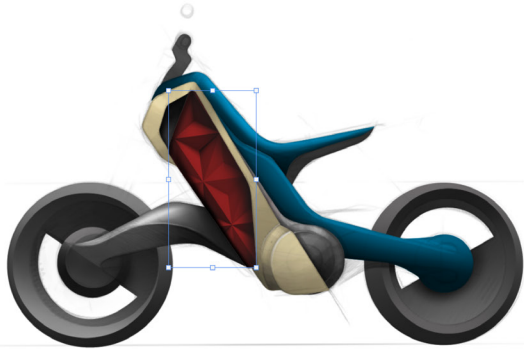
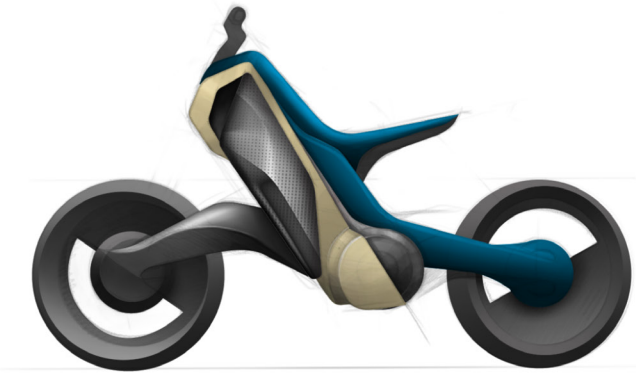
16. Direction 1 - Motorcycles

In the initial stages of exploration, efforts were made to make motorcycles more conducive to personalization, enabling individuals to express themselves more effectively. The idea revolved around incorporating dynamic forms and colors to achieve this objective.



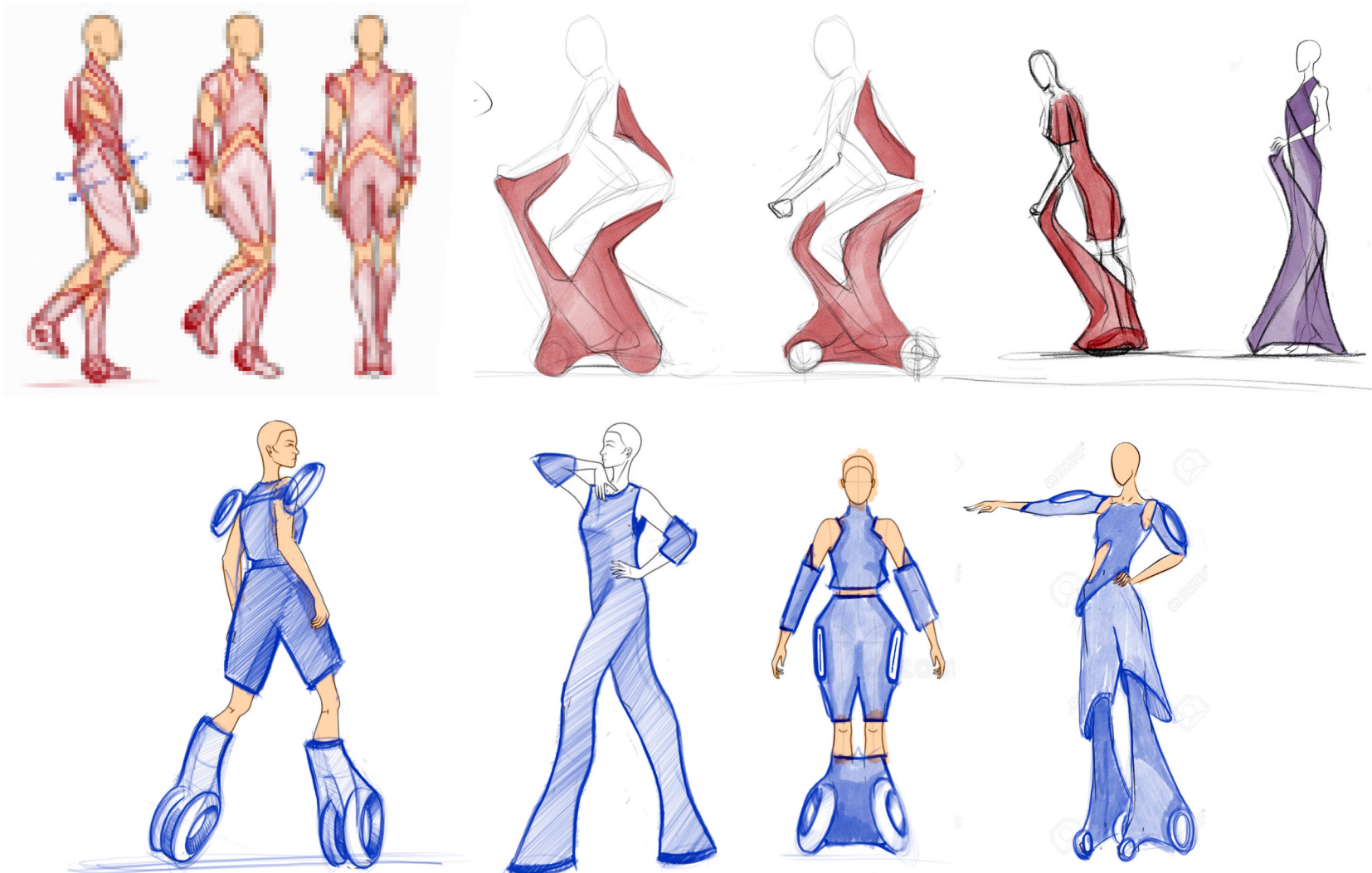






16.1 Direction 2- Wearable mobility

The next set of ideations focused on integrating mobility with clothing and outfits, with a priority on enhancing clothing aesthetics and style. The aim was to explore ways in which mobility devices could seamlessly blend with different types of clothing, ensuring a harmonious and fashionable appearance.



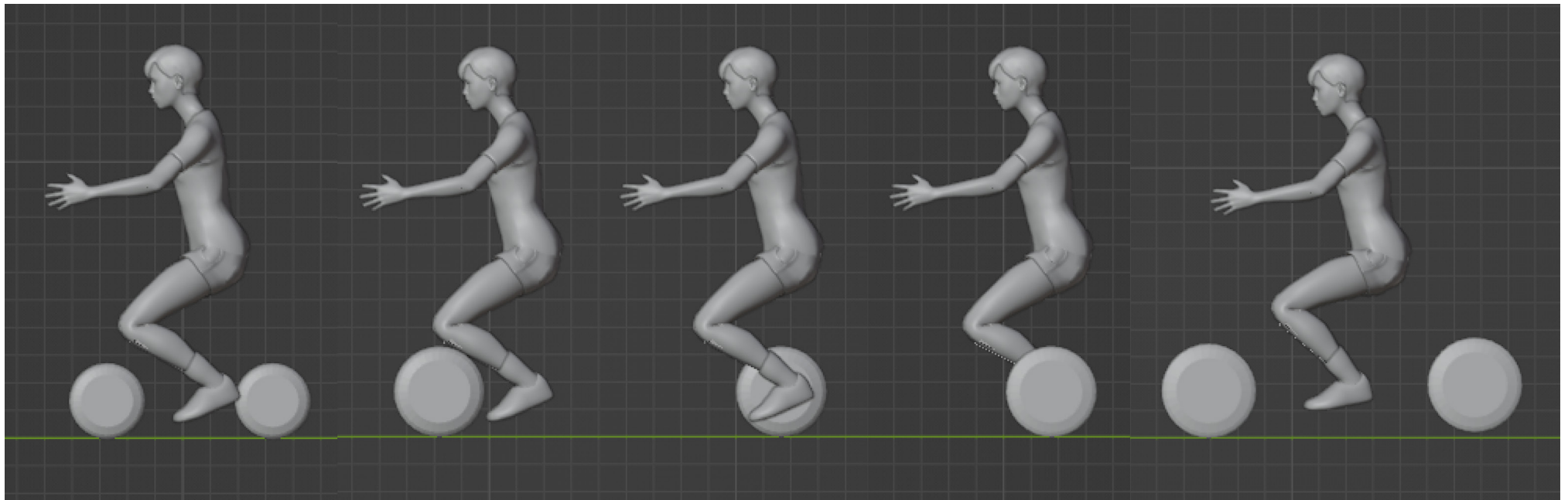
16.2 Direction 3- Compact Mobility

These concepts explore how mobility devices can be separate products while still being perceived as integral parts of a fashion outfit. The focus is on creating a cohesive and stylish appearance where mobility devices seamlessly complement and enhance the overall fashion ensemble.



17. 3D Layout Explorations

3D layout explorations were conducted using Blender to determine the optimal ergonomics and wheel layout configurations. The goal was to achieve a design that prioritizes comfort, usability, and efficiency, while ensuring that the placement of the wheels maximizes stability and maneuverability.



Wheels inline

Wheels lateral & Forward

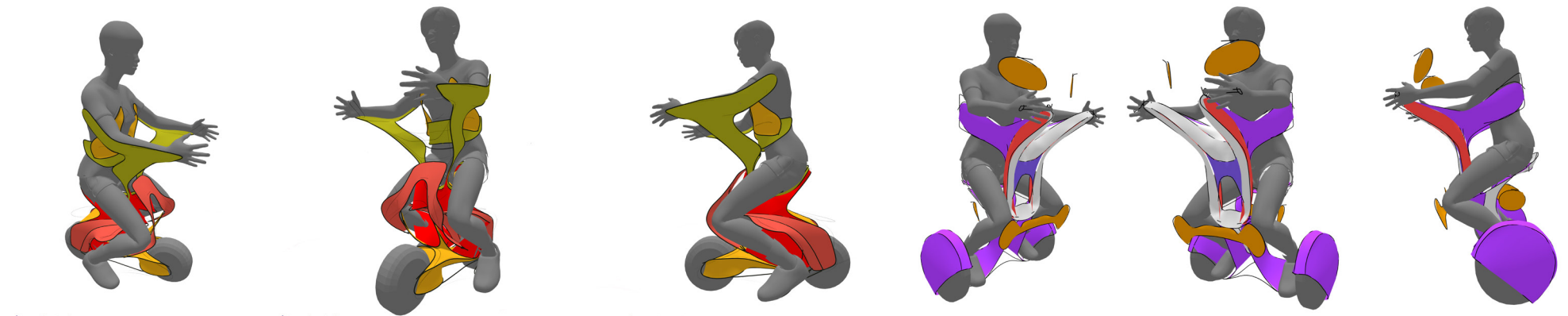
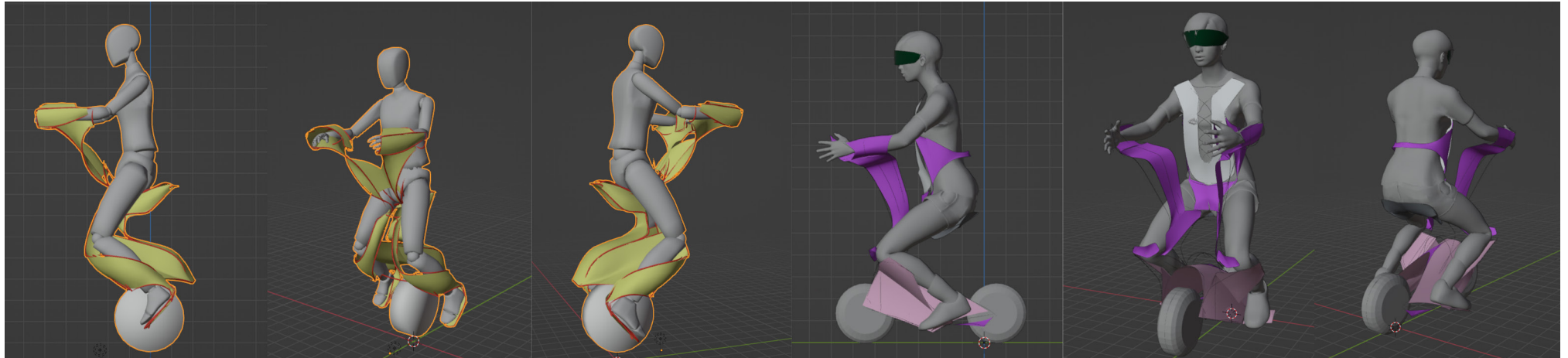
Wheels lateral & Centre

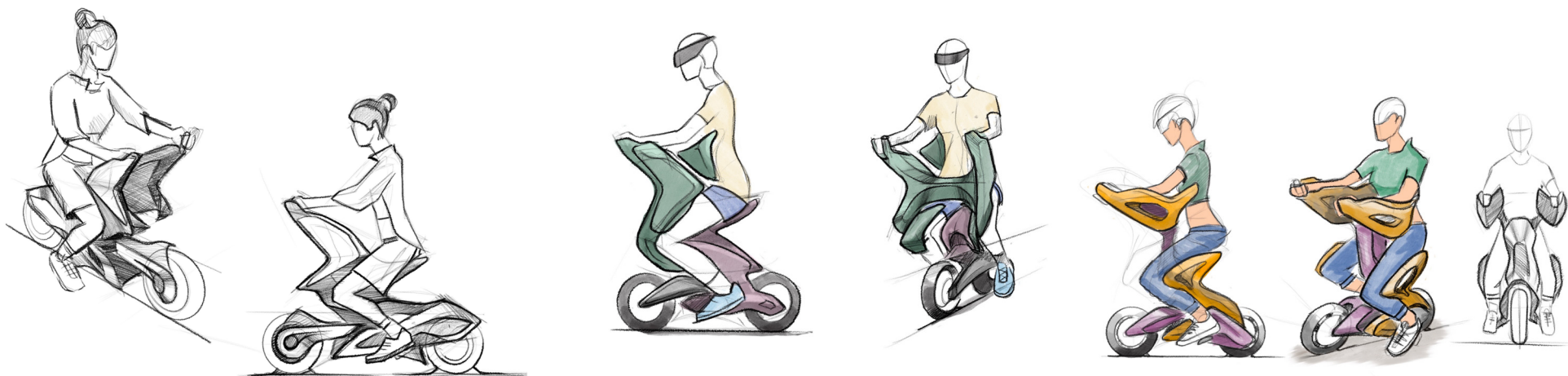
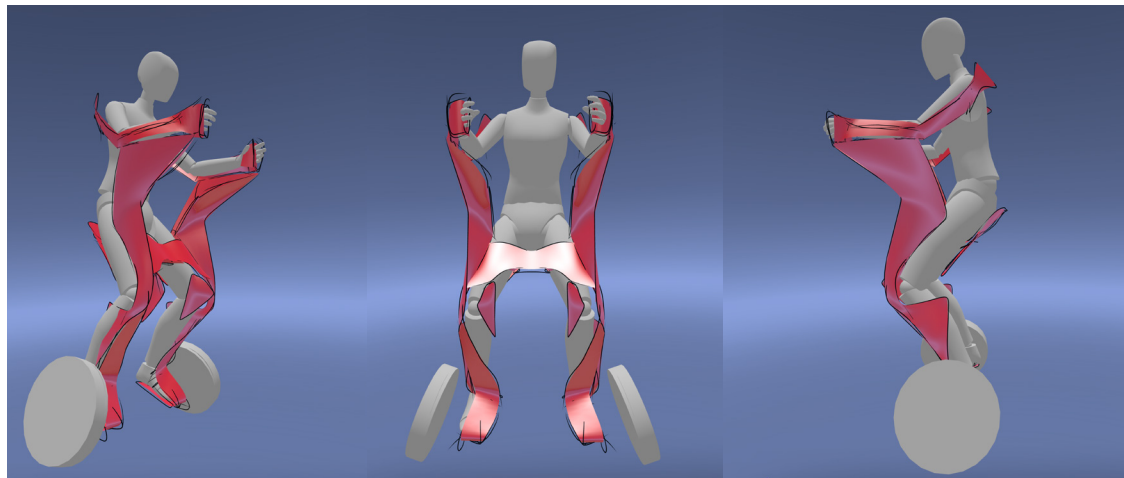
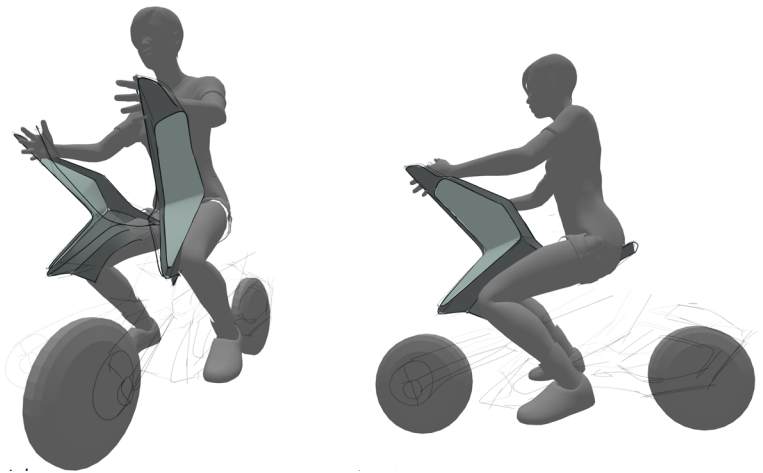
Wheels lateral & Rear

Wheels inline extended wheelbase

17.1 3D explorations in Gravity Sketch

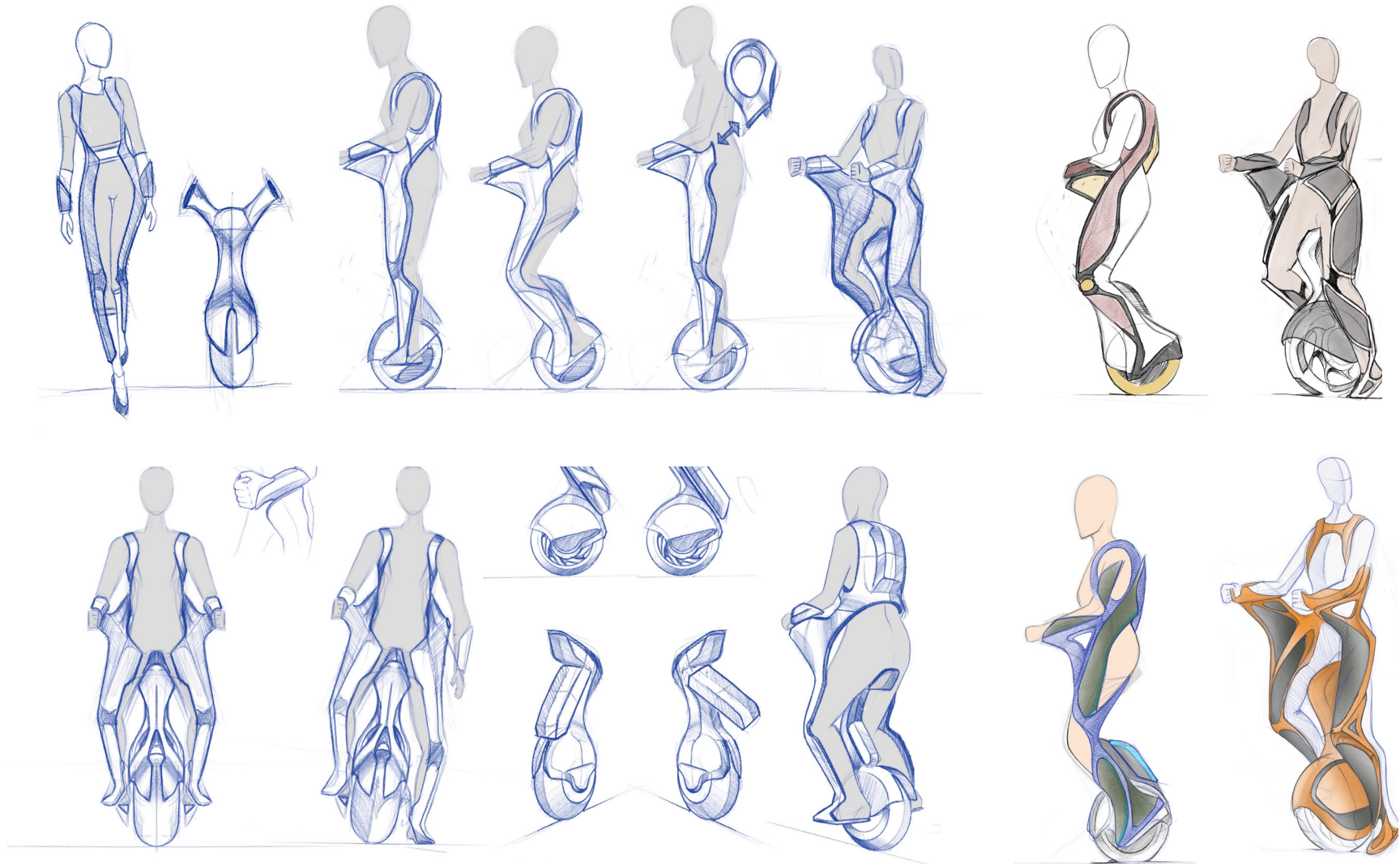
The layouts were exported to Gravity Sketch to ideate further concepts.





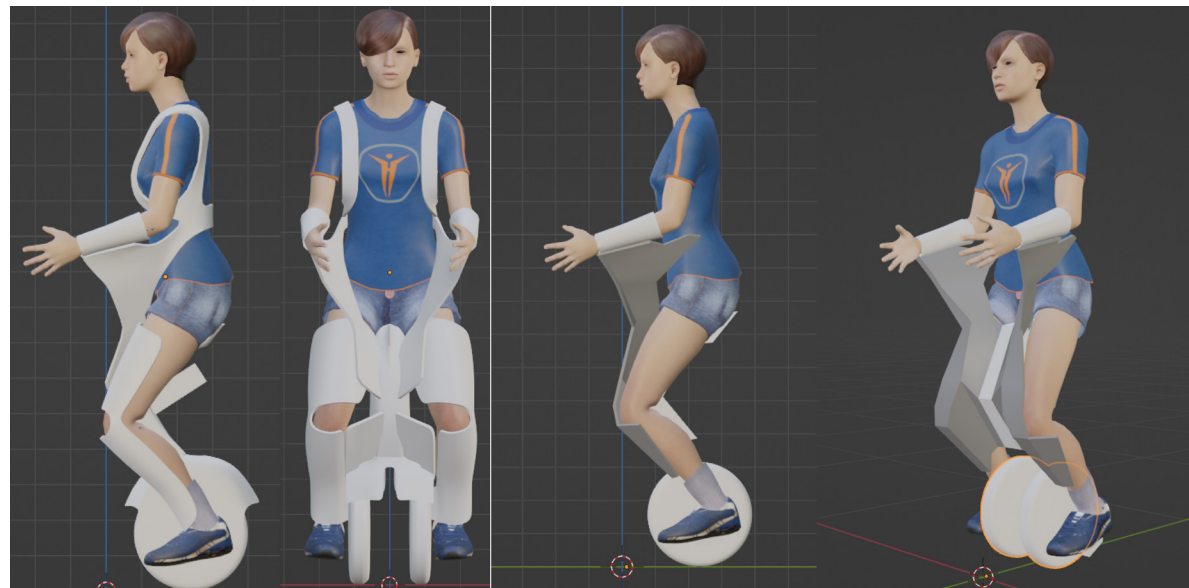
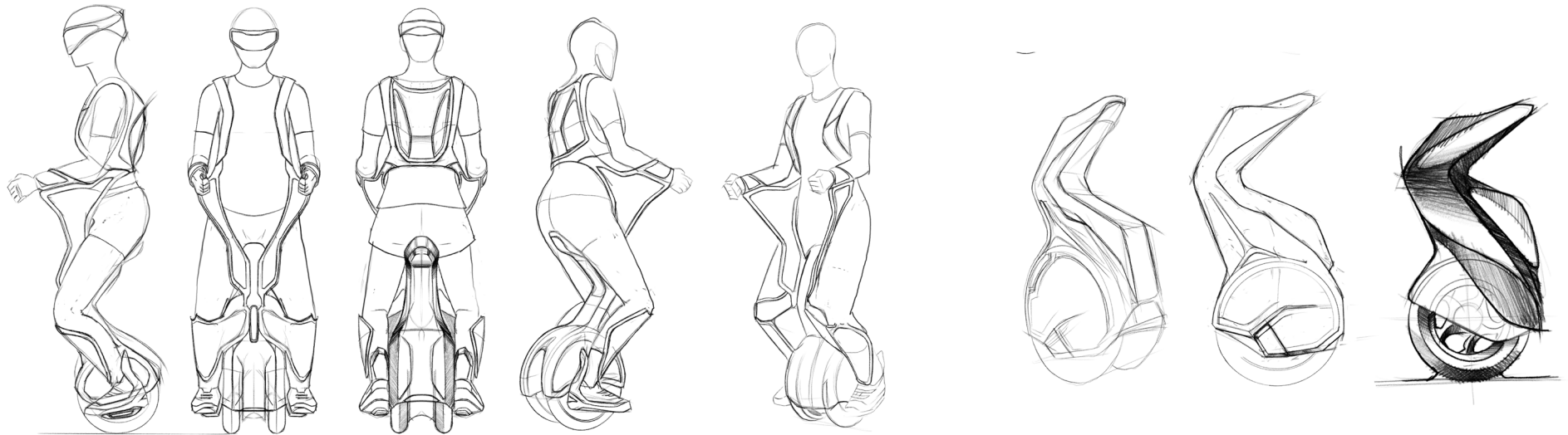
17.2 Direction 4

Explorations trying to find middle ground between previous directions and arriving at a concept where mobility device is perceived as a wearable for enhancing the personal style of the user.

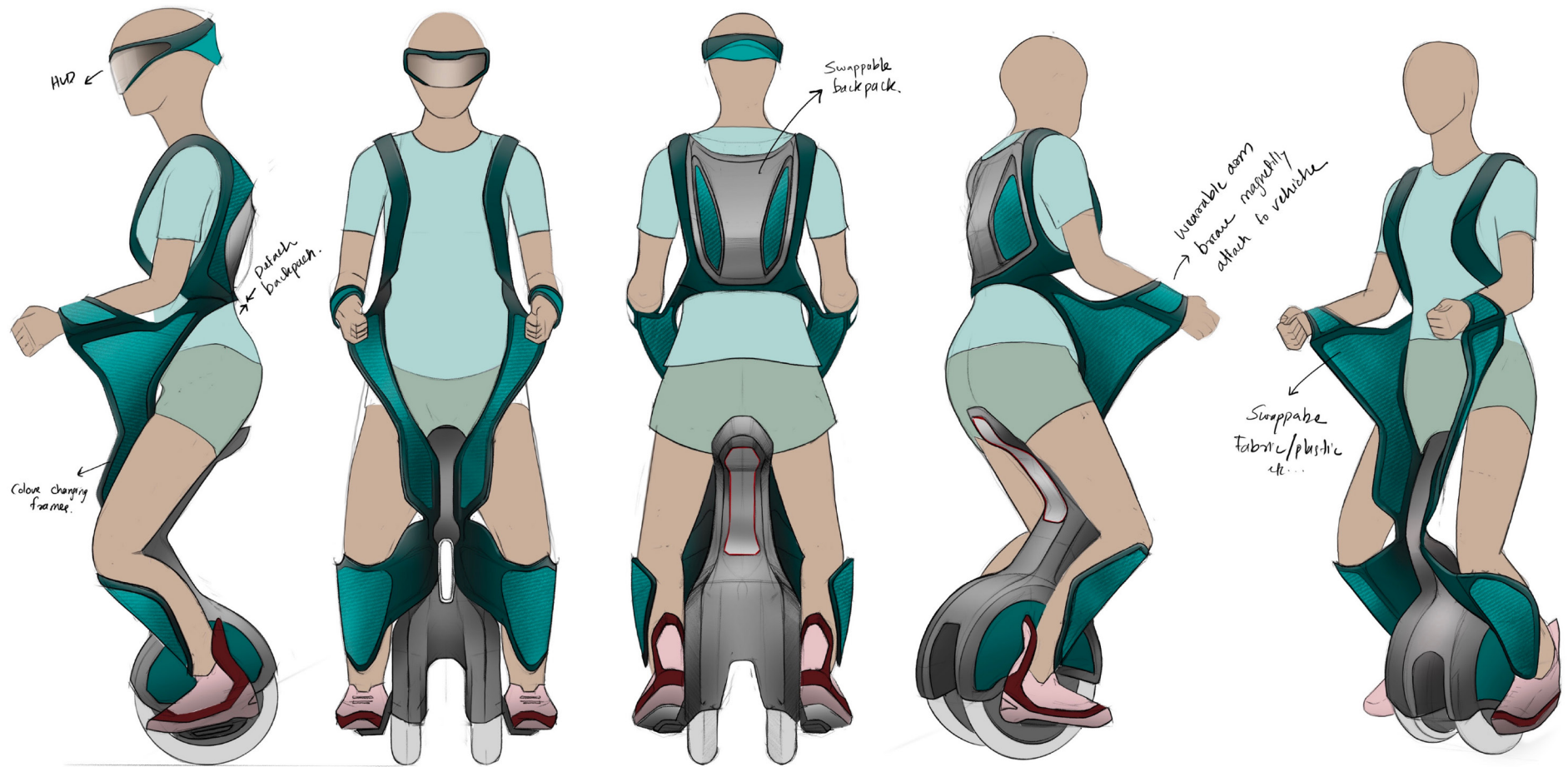


18. Concept Development - Stage I

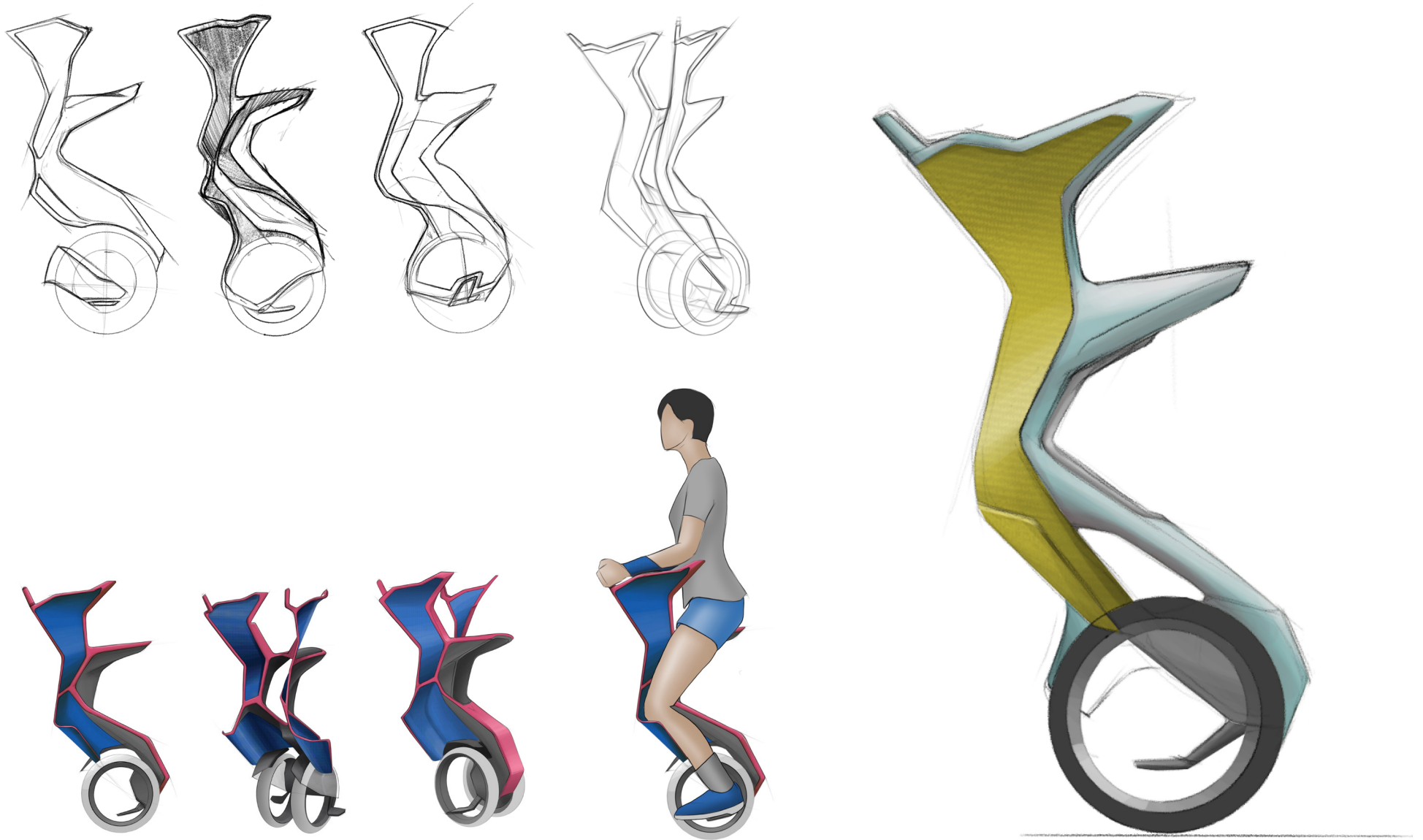
Back and forth ideations with sketching and CAD in parallel.



18.1 Concept Development - Stage II



18.2 Concept Development - Stage III

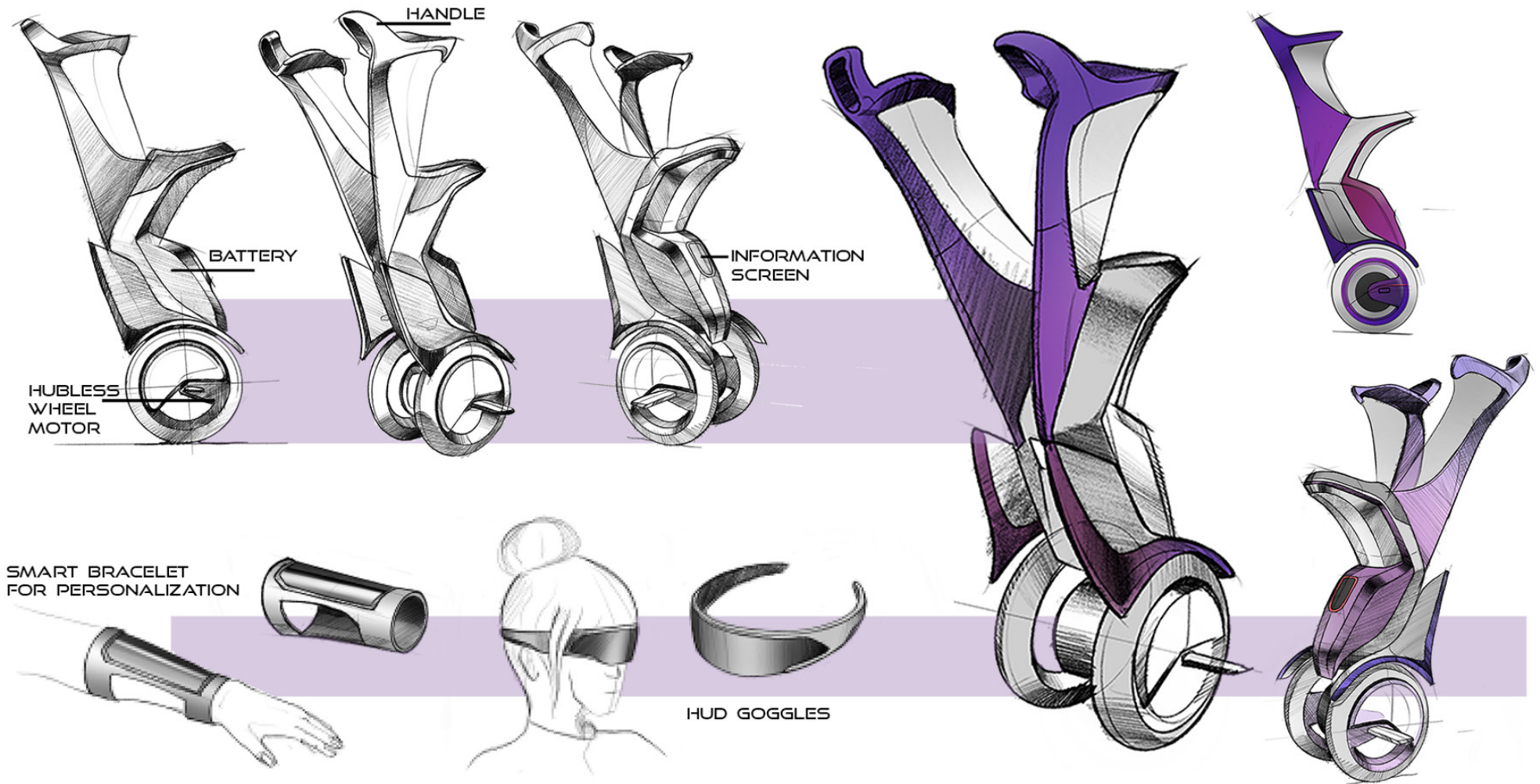


19. Moodboard

MOOD BOARD



20. Final Concept



20.1 Final Concept



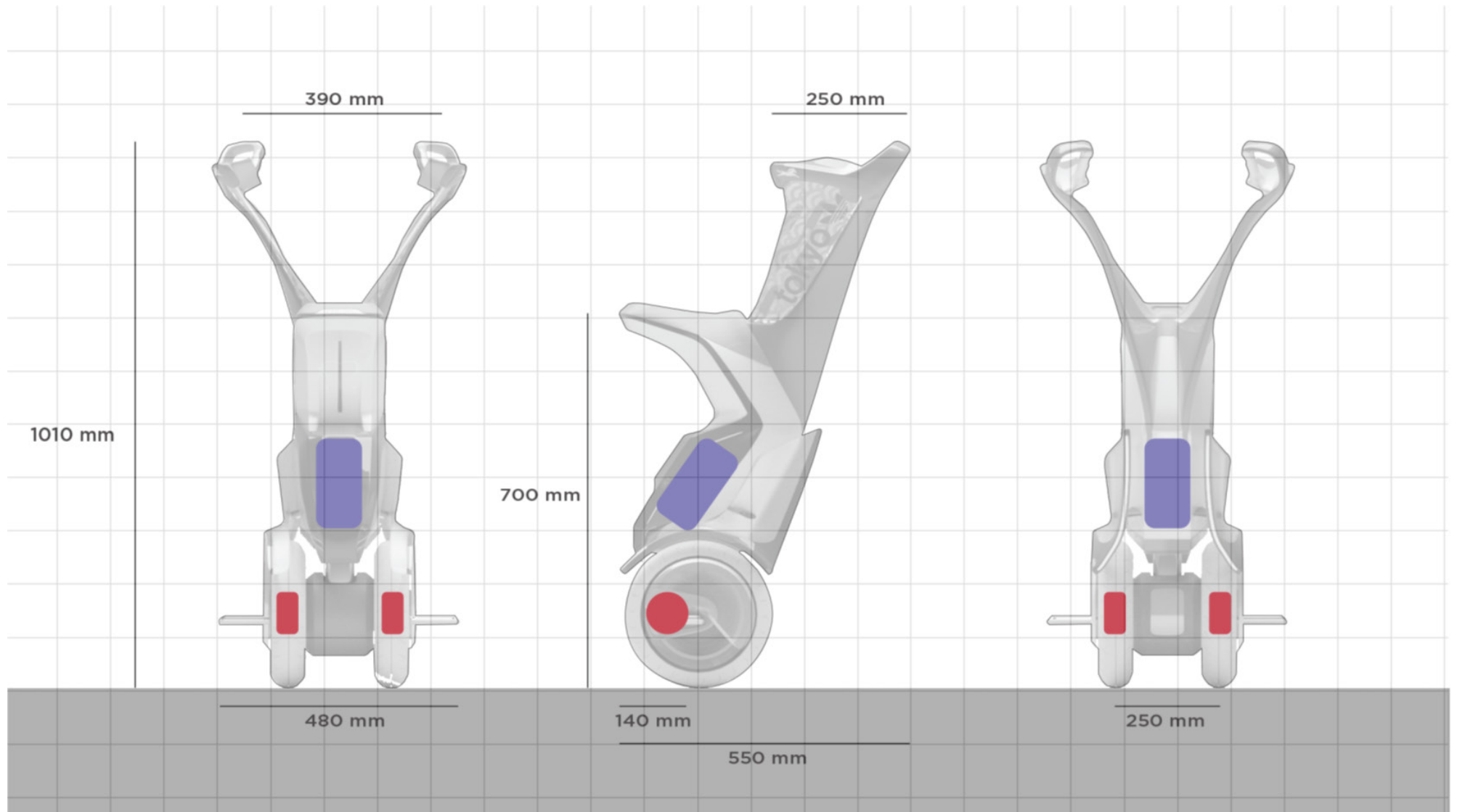
WEAR . RIDE



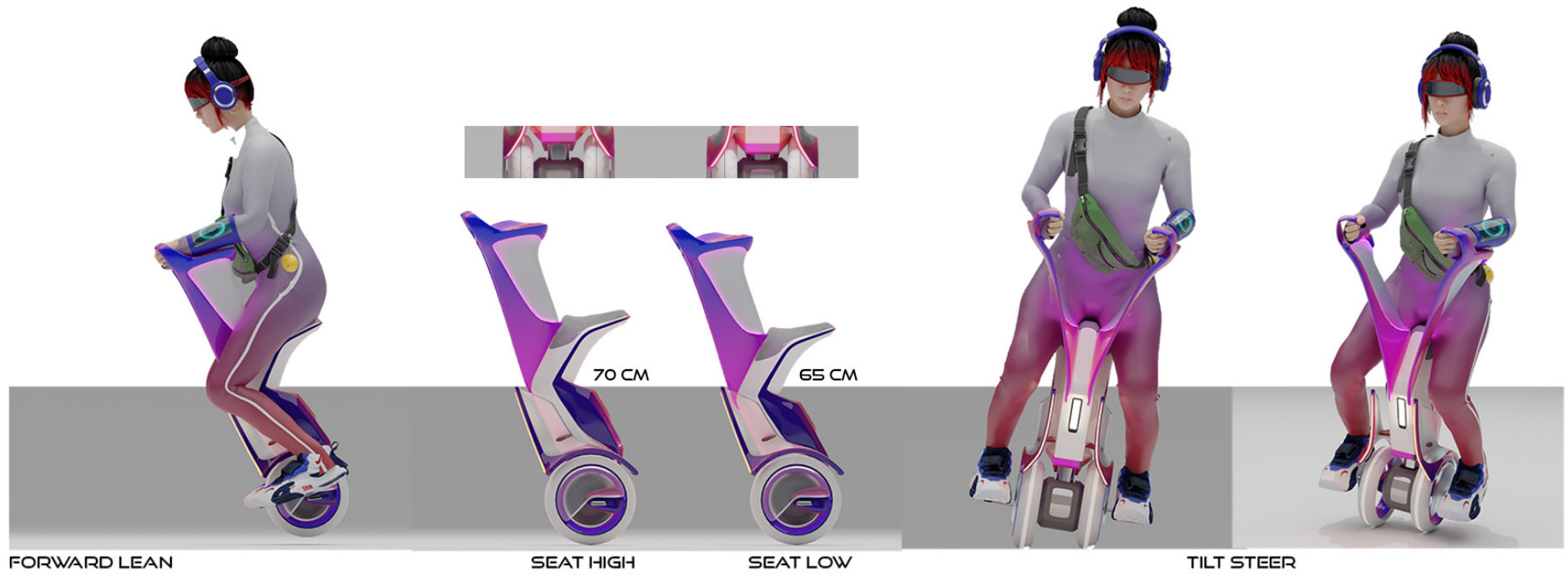




21. Technical Layout

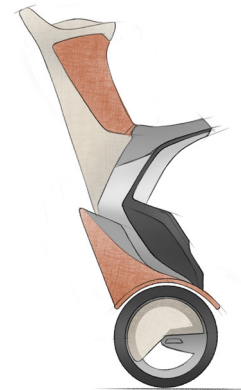


22. Mechanical Features



23. Personalisation

Personalization can be achieved through the interchangeability of panels, materials, and shifting colors. The intention is to provide users with the ability to customize and modify the appearance of the products to align with their individual style and fashion choices.



23.1 Outfit exploration 1

Personalization can be achieved through the interchangeability of panels, materials, and shifting colors. The intention is to provide users with the ability to customize and modify the appearance of the products to align with their individual style and fashion choices.



23.2 Outfit exploration 2



23.3 Outfit exploration 3



23.4 Outfit exploration 4

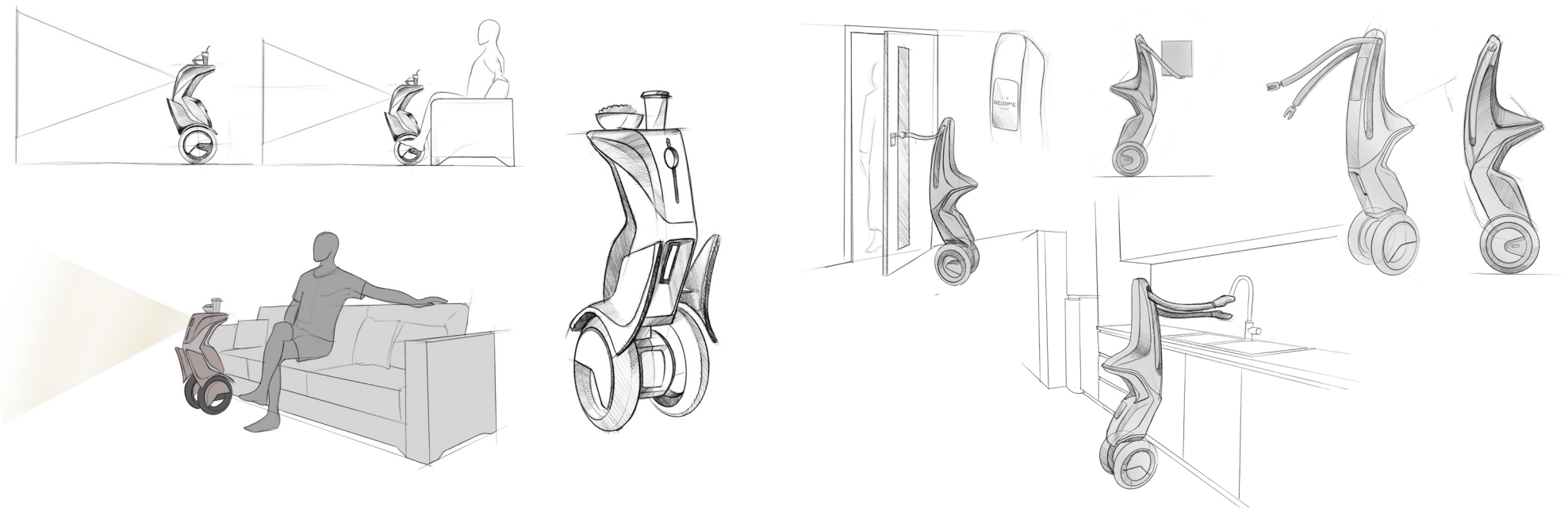


23.1 Outfit exploration 5



24. Beyond Mobility

Utilizing the base design in various other ways, these concepts showcase the versatility of the product beyond its role as a mobility device, proving its usefulness in different scenarios. By exploring alternative uses, these concepts highlight the adaptability and multifunctionality of the base design.



24.1 In-Home Assistance Device



24.2 Mobile Entertainment Device

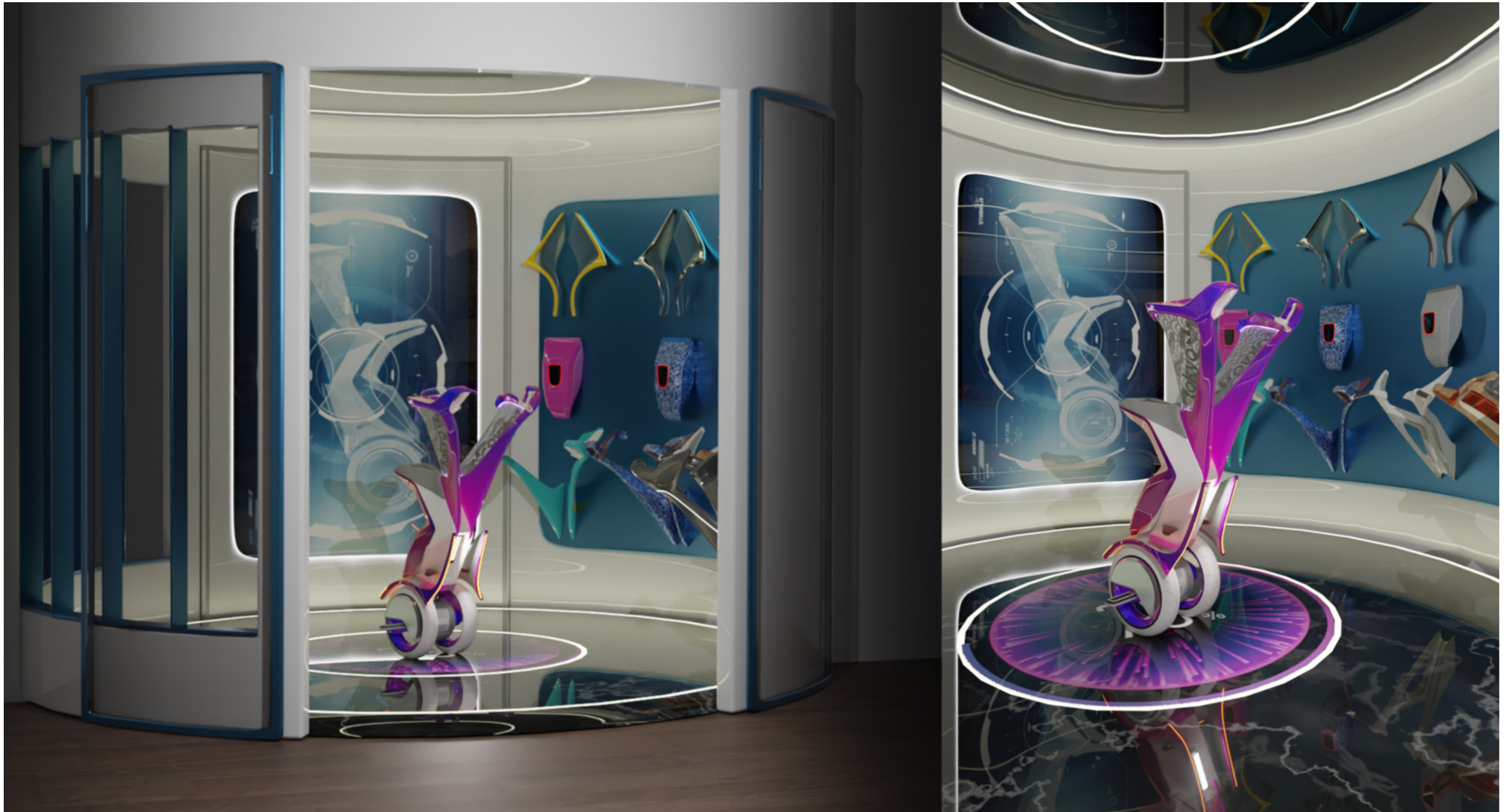


An add-on accessory designed to be converted to a mobile home entertainment device.



25. The Dock

Inspired by wardrobes for outfits and garages for vehicles, the dock is a physical space where users can store their outfits and accessories, charge their devices, and proudly display the product, combining functionality and style. This space serves as a convenient hub for organizing and showcasing the product while offering the convenience of storing and charging accessories and outfits.



26. 1:3 Prototype





27. References

The following references were extremely helpful during the research phase of the project:

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THANK YOU