

STEP OF TIME

The Influence of Cultural Histories on Footwear Design

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Abstract

STEP OF TIME
The Influence of Cultural Histories on Footwear Design

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STEP OF TIME explores how historical footwear archetypes can be reinterpreted through contemporary footwear design, digital fabrication, and brand language. Rather than using history as surface decoration, this thesis treats historical shoes as systems of silhouette, construction, material logic, and cultural meaning.

Through literature review, interviews, case studies, and prototyping, the project develops a Weighted Design System that blends historical and modern references through silhouette and execution. This method is applied to five footwear prototypes: 000_Bare foot, 001_Areni-510, 002_MuklukSuperstar, 003_MDVL, and 004_GETA.

Using Gravity Sketch, Rhino, Grasshopper, FDM TPU printing, adidas Originals DNA, and AIGC campaign development, the thesis demonstrates how historical forms can become tools for future footwear innovation.

Table of Contents

1. Introduction 1

2. Literature Review11

3. Interview 17

4. Research Methodology 19

5. Design Strategy 27

6. Design Development Process 29

7. AIGC Work Flow 97

8. AIGC Film Workflow..... 109

Conclusion..... 120

Appendix: Text for Survey Questions..... 121

Bibliography..... 123

1. Introduction

1.1 Background

Contemporary footwear design is often driven by cycles of repetition, revival, and reinterpretation. Many modern shoes continue to build upon existing silhouettes, whether through sneaker archives, performance footwear typologies, or familiar fashion forms such as loafers, boots, and high heels. This repetition can be understood not only as a commercial strategy, but also as part of a broader design logic in which existing forms are continuously modified, remixed, and recontextualized. [1]Virgil Abloh's "3% rule," for example, frames innovation as a small but meaningful shift applied to an already recognizable object or archetype (Abloh, 2017).

Cultural and historical references are frequently used in footwear design, but they often remain at a surface level. In many commercial products, culture is expressed through graphics, color palettes, patterns, or seasonal themes, while the underlying form, construction, and material logic of the shoe remain unchanged. This approach risks reducing cultural history into decoration rather than treating it as a deeper design system. [2][3]Design archetype studies suggest that familiar forms carry accumulated meanings and can guide users' recognition of new designs when they are reinterpreted structurally rather than copied visually (Lee, 2012; Pigulevskiy & Mirskaya, 2019).

Historical footwear offers a more substantial source of innovation. Shoes developed across different cultures and time periods were shaped by specific relationships between the body, environment, material availability, social identity, and making techniques. Their silhouettes and construction methods contain practical and symbolic knowledge. [4]Henrich defines culture as a body of practices, techniques, tools, values, and beliefs learned from others and accumulated over time, which supports the idea that historical artifacts can be understood as inherited systems of knowledge rather than isolated objects (Henrich, 2016). In this thesis, historical footwear is therefore understood not as a fixed image to reproduce, but as an archetype: a system of form, structure, and meaning that can be translated into contemporary design.

At the same time, digital fabrication creates new possibilities for this translation. [5]Additive manufacturing has increasingly been explored in footwear for customization, structural experimentation, and new manufacturing workflows (Cui et al., 2024; Kreutz et al., 2022; Zolfagharian et al., 2021). Tools such as Gravity Sketch, Rhino, Grasshopper, and FDM TPU 3D printing allow footwear designers to explore integrated structures, variable material density, new surface textures, and forms that are difficult to achieve through traditional footwear manufacturing. These methods provide an opportunity to reinterpret historical footwear logic through contemporary technologies, creating new forms that connect past, present, and future.

1. Virgil Abloh Harvard GSD talk Interview
<https://www.youtube.com/watch?v=hU39eXYMShA>
2. Lee, J. (2012). Using archetypes in the design process. *International Journal of Design*, 6(2), 45–57.
3. Pigulevskiy, V., & Mirskaya, L. (2020). Archetypes and design. *Design Issues*, 36(4), 77–89.
4. Joseph Henrich *The Secret of Our Success*, particularly the definition of culture
5. Cui, T. Z., Liu, Y., Zhang, H., & Wang, X. (2024). Application of 3D printing technology in footwear design and manufacture: A review of developing trends. *Textile & Leather Review*, 7(1), 1–14.

1.2 Research Motivation

Footwear has always existed between industrial design and fashion. As a product, it requires structure, ergonomics, material understanding, and manufacturing logic. As a fashion object, it also carries identity, emotion, style, and cultural meaning. This dual position makes footwear a particularly rich field for design exploration, where functional problem-solving and expressive form-making can exist within the same object.

My personal design interest has always been shaped by this tension. I am interested in the balance between rational construction and expressive experimentation: how a shoe can be technically controlled while still feeling emotional, unfamiliar, or even extreme. In my own practice, I often approach footwear through two opposing forces — restraint and instinct, logic and visual intensity. This thesis became an opportunity to explore how these tensions could be developed into a more structured design methodology.

Another motivation for this project comes from my interest in the relationship between history, modernity, and future footwear. Many contemporary shoes borrow from the past through retro silhouettes or archival references, but I am more interested in how historical footwear can be understood as a system of form, construction, and cultural logic. Instead of asking how to reproduce historical shoes, this project asks how their underlying design principles can be transformed through contemporary tools and materials.

My professional background also shaped the direction of this thesis. Through previous footwear design experiences at adidas Shanghai, Xtep, Michael Kors, and adidas headquarters in Herzogenaurach, I observed how brands constantly work with archives, existing silhouettes, and inherited design languages. These experiences made me aware that innovation in footwear rarely begins from nothing. It often emerges from recombining existing forms, materials, and cultural references in new ways. This thesis builds on that understanding by developing a system for translating historical footwear archetypes into contemporary experimental designs.

1.3 Research Questions

RQ1

How have historical footwear archetypes influenced contemporary footwear design?

RQ2

How can historical footwear forms, construction logics, and cultural references be translated into contemporary footwear through digital design and 3D printing?

RQ3

How can brand DNA, especially adidas Originals design language, be integrated into historical reinterpretation to create new footwear forms?

1.4 Thesis Overview

This thesis is organized into several connected sections. The literature review first examines historical footwear, cultural context, archetype theory, anthropology, and 3D printing in contemporary footwear design. These studies provide the theoretical foundation for understanding historical footwear not only as visual reference, but as a system of form, construction, and cultural meaning.

The following section introduces the primary research, including interviews with footwear designers, brand leaders, 3D footwear specialists, and sneaker consumers. Insights from these interviews inform the development of the Weighted Design System, a methodology that translates historical and modern footwear references through silhouette and execution.

The design development chapters then document the creation of five footwear prototypes: 000_Barefoot, 001_Areni-510, 002_MuklukSuperstar, 003_MDVL, and 004_GETA. Each project includes cultural research, sketch exploration, digital modeling, material testing, FDM TPU prototyping, and reflection. The thesis also includes an AIGC campaign development section, where lookbooks and campaign films extend the physical prototypes into broader visual worlds of body, garment, environment, motion, and sound.

The final discussion reflects on the role of reinterpretation, archetype methodology, 3D printing, brand DNA, and AIGC storytelling in contemporary footwear design. The conclusion summarizes the project's contributions and positions historical footwear as a design system that can be reactivated through future-facing tools and methods.

2. Literature Review

2.1 Historical Footwear and Cultural Context

Footwear is not only a functional object for protecting the foot; it is also a cultural artifact that reflects the relationship between the body, environment, material, technology, and social identity. Across different historical periods and regions, shoes have developed in response to specific conditions of daily life, climate, mobility, labor, ritual, status, and aesthetics. [6]Because of this, footwear can be read as a material record of how people lived, moved, and understood the body within a particular cultural context (Riello & McNeil, 2006; The Collector, 2019).

The form of historical footwear was often shaped by environmental and geographical needs. In cold regions, shoes developed around insulation, layering, and protection from snow and moisture. In mountainous or rocky environments, footwear needed to respond to grip, durability, and terrain. In wet or muddy environments, elevated soles helped separate the body from the ground. These examples show that footwear silhouettes and constructions were not arbitrary visual styles, but adaptive responses to specific ways of living. From an anthropological perspective, [7]material objects can be understood as accumulated cultural knowledge, shaped and transmitted through generations of practice (Henrich, 2016). Historical shoes therefore carry both practical solutions and cultural meanings.

Footwear has also played an important role in expressing identity and social position. Certain shoes were associated with class, gender, ritual, occupation, or cultural belonging. Medieval pointed shoes, for example, [8]were not simply functional objects, but visual markers of status and aristocratic identity in Europe (Riello & McNeil, 2006). These examples demonstrate that footwear often operates between utility and symbolism, functioning as both a tool for movement and a sign of social meaning.

This thesis focuses on five historical footwear references as archetypes: barefoot movement, the Areni-1 shoe, Inuit mukluks, medieval pointed shoes, and Japanese geta. Each example represents a different relationship between the body and its environment. Barefoot movement relates to the body's original contact with the ground. The Areni-1 shoe demonstrates early leather footwear construction and protection. Mukluks reflect cold-weather adaptation through wrapping, layering, and insulation. Medieval pointed shoes reveal how footwear can express social hierarchy and visual exaggeration. Geta show how elevation, wood structure, and dress culture can shape footwear form. Together, these examples suggest that historical footwear is not only a visual archive, but a collection of cultural and technical systems that can be reinterpreted through contemporary design.

6. Riello & McNeil, 2006; The Collector, 2019
7. Joseph Henrich The Secret of Our Success,
particularly the definition of culture
8. Riello & McNeil, 2006; The Collector, 2019

2.2 3D Printing and Contemporary Footwear

Additive manufacturing has become an important area of experimentation within contemporary footwear design. Compared with traditional footwear manufacturing, which often depends on molds, cutting, stitching, assembly, and multi-part production, [9][10] 3D printing allows designers to explore more integrated and digitally controlled structures. In footwear, this creates opportunities for new forms of customization, localized performance, and material efficiency, especially in midsoles, outsoles, and experimental upper structures (Cui et al., 2024; Kreutz et al., 2022).

One of the major advantages of 3D printing in footwear is its relationship to customization and digital fabrication. Because digital models can be adjusted before printing, footwear can potentially respond more directly to individual foot shape, pressure distribution, movement behavior, and user-specific performance needs. [11][12] This makes additive manufacturing especially relevant to future footwear systems, where production may shift from standardized sizing toward more adaptive and personalized design workflows (Kreutz et al., 2022; Zolfagharian et al., 2021).

Different 3D printing processes and materials also create different design possibilities. Selective Laser Sintering (SLS) can produce complex forms with higher accuracy and less support structure, making it suitable for professional prototyping and commercial experimentation. However, it is often more expensive and less accessible for independent designers. Fused Deposition Modeling (FDM), by contrast, is more affordable and flexible for iterative prototyping, but it introduces challenges such as visible layer lines, support marks, printing failure, and surface inconsistency. [13] Thermoplastic polyurethane (TPU) is particularly relevant to footwear because of its flexibility, durability, and elastic behavior, but its performance depends heavily on print settings, material hardness, density, and structural design (Cui et al., 2024; Zolfagharian et al., 2021).

In this thesis, 3D printing is understood not only as a manufacturing method, but also as a design language. The ability to print integrated structures, variable densities, repeated surface textures, and complex organic forms allows footwear to be designed differently from traditional cut-and-sew or molded construction. Instead of separating upper, midsole, outsole, and surface detail into independent components, digital fabrication makes it possible to think of the shoe as a continuous structure. This is especially important for this project, where historical footwear archetypes are reinterpreted through new forms of wrapping, layering, texture, and integrated support. These constraints shaped the prototyping process throughout this thesis and became part of the design methodology rather than only technical problems to be solved.

9. Cui, T. Z., Liu, Y., Zhang, H., & Wang, X. (2024). Application of 3D printing technology in footwear design and manufacture: A review of developing trends. *Textile & Leather Review*, 7(1), 1–14
10. Kreutz, M., Böttjer, A., Trapp, M., Lütjen, M., & Freitag, M. (2022). Towards individualized shoes: Deep learning-based fault detection for 3D printed footwear. *Procedia CIRP*, 107, 196–201.
11. Kreutz, M., Böttjer, A., Trapp, M., Lütjen, M., & Freitag, M. (2022). Towards individualized shoes: Deep learning-based fault detection for 3D printed footwear. *Procedia CIRP*, 107, 196–201.
12. Zolfagharian, A., et al. (2021). Custom shoe sole design and modeling toward 3D printing. *Journal of Manufacturing Processes*, 68, 1–12.
13. Cui, T. Z., Liu, Y., Zhang, H., & Wang, X. (2024). Application of 3D printing technology in footwear design and manufacture: A review of developing trends. *Textile & Leather Review*, 7(1), 1–14



FDM



SLA



SLS

2.3 Archetypes in Design

In design, an archetype can be understood as a recognizable form, structure, or pattern that carries accumulated meaning through repeated use and cultural familiarity. Rather than existing as a fixed style, an archetype functions as a design lens: it allows designers to identify the underlying logic of an object and reinterpret it in new contexts. [14][15] Previous studies on design archetypes suggest that archetypes can help designers work with familiar forms while creating new meanings through transformation, recombination, and reinterpretation (Lee, 2012; Pigulevskiy & Mirskaya, 2019).

This distinction is central to historical reinterpretation. Visual copying often reproduces the appearance of a historical object without engaging with its deeper logic. Reinterpretation, by contrast, asks which parts of the archetype should be preserved, transformed, exaggerated, or combined with other systems.

[16][17][18][19][20] Virgil Abloh's "3% Rule" also provides a useful framework for understanding reinterpretation in contemporary design. Abloh proposed that an object can become new through a small but meaningful shift applied to an existing form or cultural object. This idea is relevant to footwear because many contemporary shoes already operate through modification, remixing, and archival reference. However, this thesis expands the idea beyond surface change by applying reinterpretation to structure, construction, material, and archetypal logic.



Off-White x Air Jordan 1 Retro High OG "Chicago"

14. Lee, J. (2012). Using archetypes in the design process. *International Journal of Design*, 6(2), 45–57.
15. Pigulevskiy, V., & Mirskaya, L. (2020). Archetypes and design. *Design Issues*, 36(4), 77–89.
16. Off-White™. (2019). Virgil Abloh on design, culture, and education [Video]. YouTube. <https://www.youtube.com/watch?v=hU39eXYMShA>
17. Abloh, V. (2017). Insert complicated title here [Video]. YouTube. <https://www.youtube.com/watch?v=i96hAv25HPU>
18. Abloh, V. (2018). Harvard GSD lecture [Video]. YouTube. <https://www.youtube.com/watch?v=qjvnGx-Miba8&t=848s>
19. Off-White™. (2019). Virgil Abloh on design, culture, and education [Video]. YouTube. <https://www.youtube.com/watch?v=hU39eXYMShA>
20. Louis Vuitton. (2019). Virgil Abloh interview clip [Video]. YouTube. <https://www.youtube.com/watch?v=qje5VITX6eQ>

Archetypal thinking also appears in design fields beyond footwear. In vernacular architecture, traditional building forms are often shaped by climate, local materials, and cultural behavior, then reinterpreted in contemporary architectural projects as spatial or environmental systems rather than copied visual styles. Across architecture, product design, and fashion, archetypes function as distilled visual memories — structures, proportions, or silhouettes that persist across time because they resonate culturally and perceptually. Archetypes are not fixed styles; they are recurring formal logics that designers reinterpret to speak to new contexts.

In vernacular architecture, for example, the Shadowless Church reimagines the traditional European chapel silhouette using translucent rods. The underlying archetype — the pitched roof, tower, and axial geometry — remains intact, but the execution shifts entirely through material innovation, proving how a historic form can be translated without imitation.

the Louis Ghost Chair modernizes an 18th-century fauteuil into a transparent plastic shell; Balenciaga Hourglass Bag distills mid-century couture silhouettes into a sculptural handbag. These examples share the same logic: keep the archetype, reinvent the execution.

Within this thesis, footwear archetypes operate in the same way. Each selected historical reference provides an underlying system that can be translated into a new footwear form through contemporary design tools, adidas brand DNA, and digital fabrication. This approach supports the broader argument of the project: history is not simply a visual archive, but a system waiting to be redesigned.



Shadowless Church



Louis Ghost chair



Balenciaga Hourglass handbag

2.4 Anthropology and Cultural Transmission

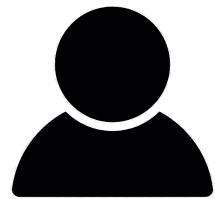
[21][22] Joseph Henrich's theory of cultural evolution provides an important foundation for understanding historical footwear as more than isolated objects. In *The Secret of Our Success*, Henrich argues that human culture is built through accumulated knowledge, learned behaviors, techniques, tools, values, and practices that are passed across generations (Henrich, 2016). From this perspective, culture is not only symbolic expression, but also a system of practical knowledge that allows people to adapt to specific environments and social conditions.

This idea is especially relevant to footwear design. Historical shoes were often developed through repeated adaptation to climate, terrain, available materials, bodily movement, and social behavior. Their forms were not created only for visual identity; they also carried knowledge about how people walked, worked, protected the body, displayed status, or participated in ritual. In this sense, footwear can be understood as an artifact of cultural transmission: a physical object that stores and communicates accumulated knowledge through its silhouette, construction, material, and use.

21. Joseph Henrich *The Secret of Our Success*, particularly the definition of culture
22. Joseph Henrich *The Secret of Our Success*, particularly the definition of culture

3. Interview

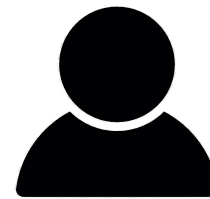
What designers, consumers, and brand owner told me



Brand Owner

"I usually design shoes the way architects design buildings — I take inspiration from history, break it apart, remix it, and add my own 1% of creativity to build a new design language. You might not spot what I referenced from any single angle, but when you look at the whole thing, you can totally feel the vibe."

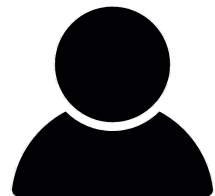
"3D is like a new language — you can think of it as writing a sci-fi story that instantly generates visuals. The only limit is your imagination."



Owner & Expert

"Taking things from archives are the daily life of brand designer, things from 70s 80s are even more popular nowadays than you thought"

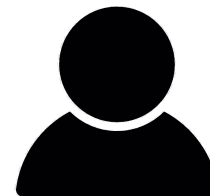
"3D print technology has always been one of the most important ideation process through the whole design project, In the end, no matter if this product is fully 3d printed or includes other treatments, we always print out everything first to have a look."



Design Expert

"adidas has countless history archives, even from now on our daily work is creating new things based on the archives and every season we bring back 1 of 1 from it. That's the DNA of a brand and also a great way to make every adidas product looks adidas."

"Last year we have 3d print product for running, and we also have project used 3d print inspired treatment for fashion, it depends on which area are you focusing on, or it could be both."



Consumer

"As a consumer, the design and historical narratives behind a sneaker influence my purchase decisions. It's not just about aesthetics but the story and culture embedded within."

"3d print shoes sounds cool and new for me because I can wear something new and customize the one and only for myself."

Through interviews with independent designers, brand owners, sneakerheads, 3D-print experts, and brand design directors, several insights emerged:

1. The Power of Historical Reference

Designers consistently emphasized that heritage provides emotional depth and authenticity. As one interviewee said: "Historical elements add depth; they affect consumer preference more than people realize."

2. Reconstruction, Not Replication

A recurring theme was remixing rather than copying.

"I design shoes the way architects design buildings — break history apart, remix it, add 1% of my ideas."

3. 3D Printing as Creative Language

Industry professionals described 3D printing as an ideation tool rather than just a final output.

"We print everything first — even when the final shoe isn't 3D printed."

4. Brand DNA & Archives Matter

Archive-informed innovation is central to major brands:

"Every season we bring back 1-of-1 from the archive — that's how we make adidas look like adidas."

In conclusion:

History is a system, not a source of decoration

Archives serve as repositories of brand DNA, not just a nostalgia.

3D printing is a bridge of new ideation to practical experiments, not just a production method.

4. Research Methodology

4.1 Case Study- Learning From Good and Bad Cultural Referencing

I started from searching “XX country history shoes” and “XX country culture sneakers”:



After seen the big difference between the history shoes and modern “history” related shoes, I analyzed footwear examples across two categories:

1. Bad Examples — When Cultural Reference Becomes Shallow

Problems included:

using motifs as decoration without understanding context,
misrepresenting cultural meaning,
relying on patterns without structural or functional logic.

2. Good Examples — When Reference Is Structural, Not Decorative





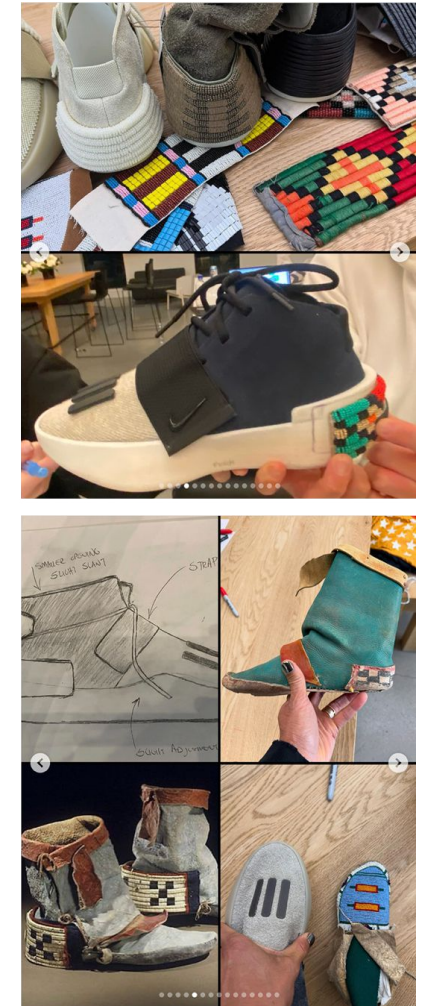
Masion Margiela Tabi sneakers

KEEP: split toe
CHANGE: execution



Fear of God x Adidas Basketball

KEEP: Moccasin design language
CHANGE: silhouette



From these cases I separated these examples into 2 groups and formulated my core design equation:

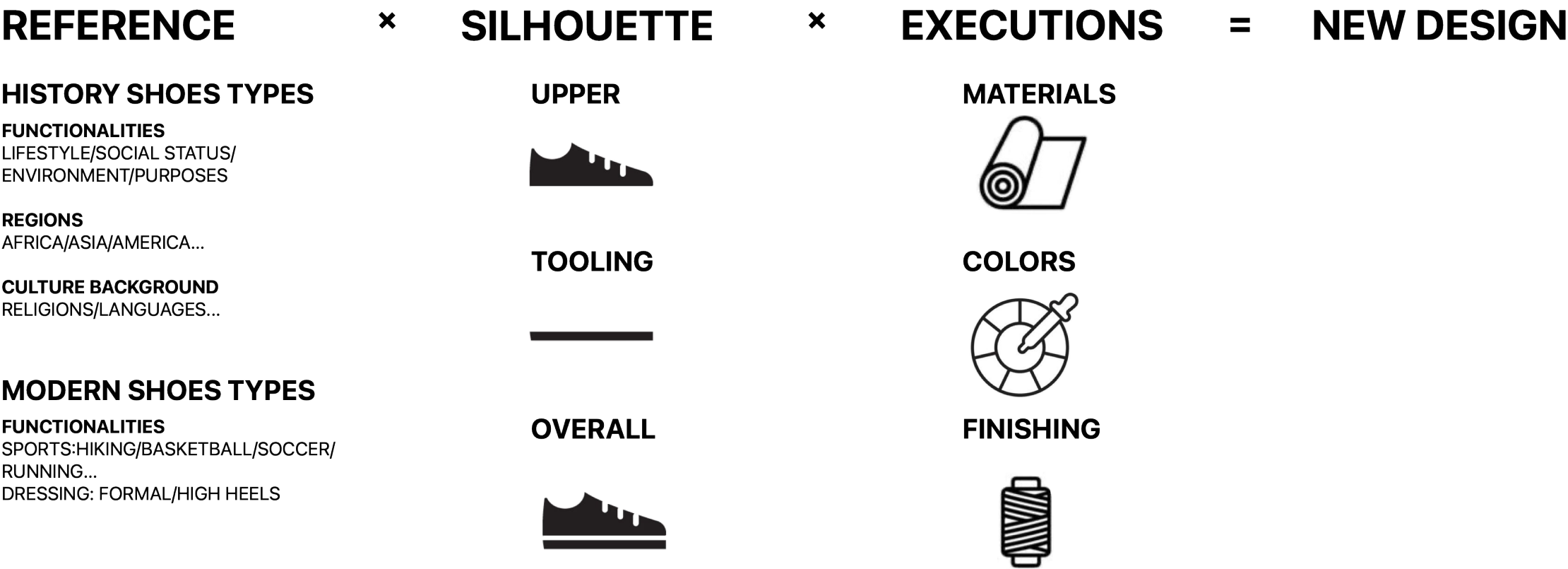
SAME SILHOUETTE, NEW EXECUTIONS



SAME EXECUTIONS, NEW SILHOUETTE



4.2 New frame work



But the formula is not equal-weighted. Some designs begin from historical silhouette + modern execution; others begin from modern silhouette + historical execution.

4.3 Weighted System

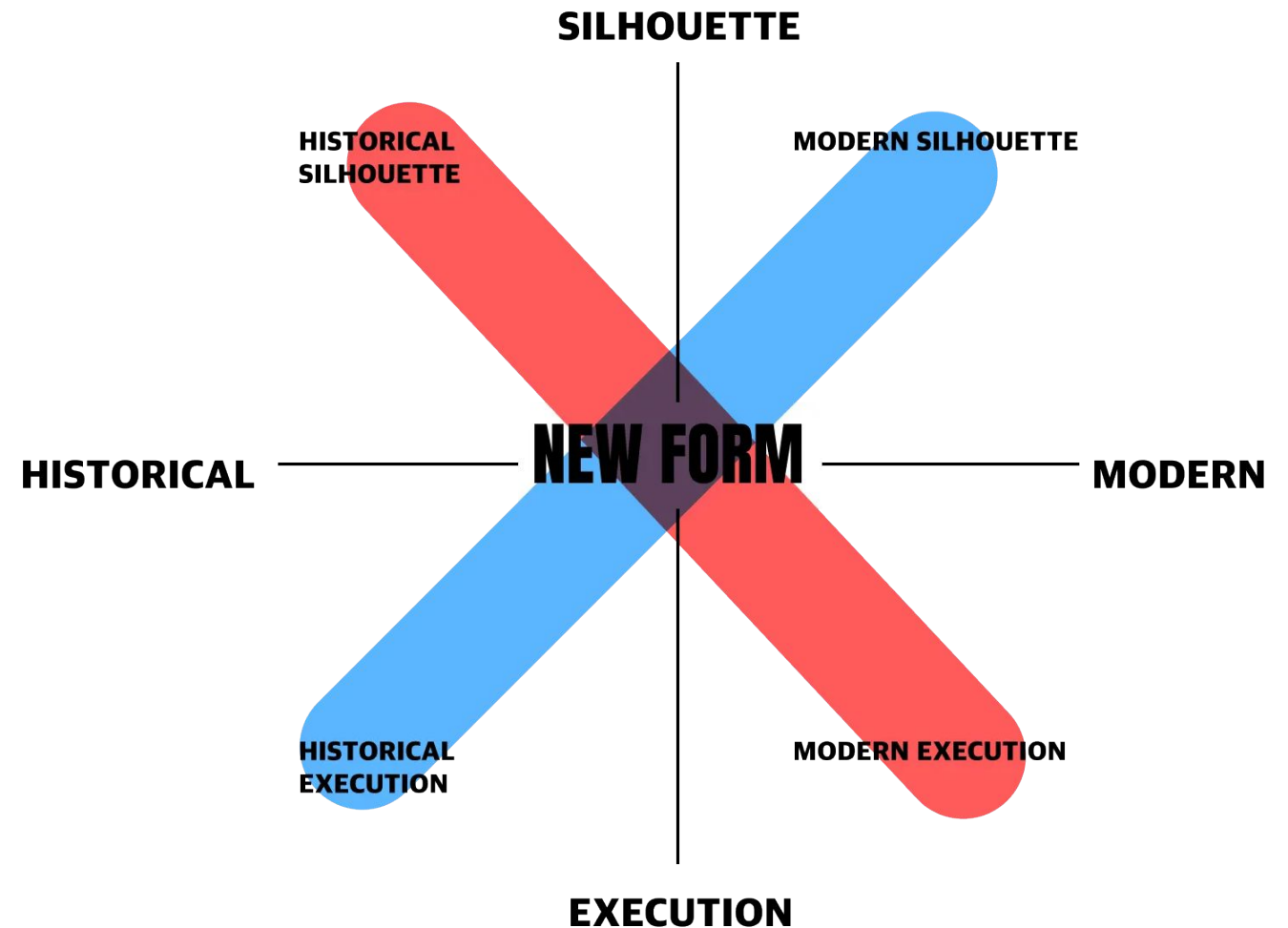
Method Summary:

Reference – Select silhouette or execution – Combine with contrasting domain – New form

This Variable Weighting Framework allows a designer to: borrow a silhouette from history and combine it with modern execution, borrow a modern silhouette and apply historical execution, always producing something new, not derivative.

Variable Weighting

The Weighted Design System does not treat historical and modern references as equal or fixed components. Instead, each project uses a different balance depending on the specific logic of the selected archetype. Some designs rely more heavily on historical silhouette, while others are driven by historical construction, modern footwear typology, or contemporary execution methods. This variable weighting allows each shoe to respond to its own historical source rather than forcing all five projects into the same formula.



5. Design Strategy

5.1 Selection of Five Archetypes

The design development process began with the selection of five historical footwear archetypes, each representing a different relationship between the body, environment, culture, and construction. Rather than choosing these references only for their visual appearance, I selected them because each one contained a specific design logic that could be translated into contemporary footwear.



6000-4000 BC
AFRICA



3500 BC
ARMENIA



2500 BC
ARCTIC



1470
FRANCE



1603
JAPAN

This structure was applied across the five footwear projects. Each stage helped translate historical footwear archetypes into contemporary design outcomes, moving from cultural research to physical prototypes and finally into campaign storytelling.

5.2 Work Flow

The design development of this thesis followed a five-stage workflow:

Research - Ideation - 3D Modeling - Sampling - AIGC Product Campaign

Ideation- Sketch, Sculpting, Procreate

3D Modeling- Gravity Sketch, Rhino, Grasshopper, Adobe Illustrator, Photoshop

Sampling- Material Experiments, FDM TPU printing, Fabrication

AIGC Product Campaign- Nanobananas, ChatGPT, Seedance, Suno

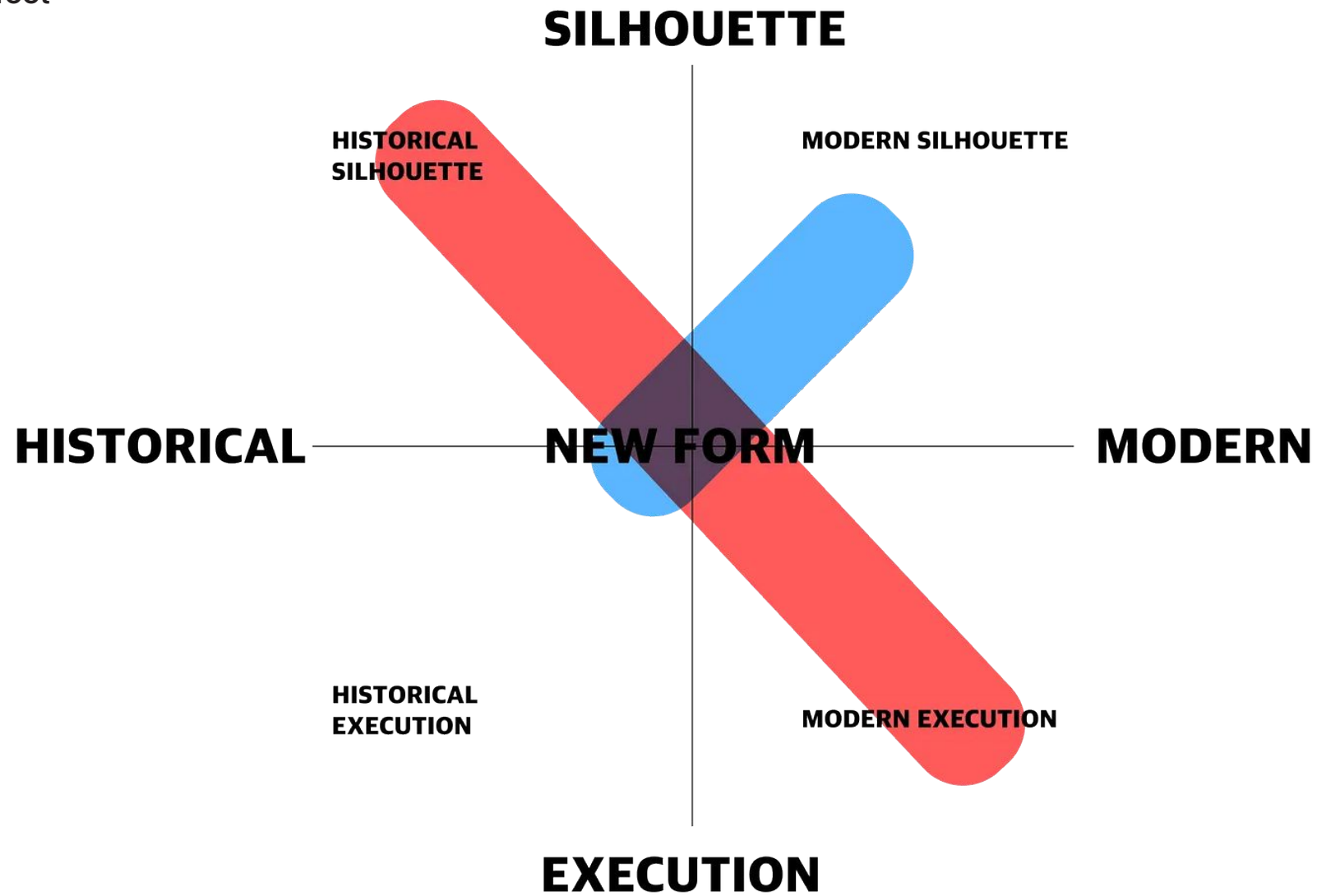
5.3 Prototyping Strategy

The final prototypes were developed around a US 9.5 / 275 mm last(Men) and US 5.5 / 240mm.

Throughout the process, prototyping focused on the balance between flexibility and support. Internal density became one of the most important variables, because different parts of the shoe required different structural behaviors. Toe and upper areas needed flexibility, while outsole, heel, and support zones required greater rigidity.

6. Design Development Process

6.1 000_Barefoot

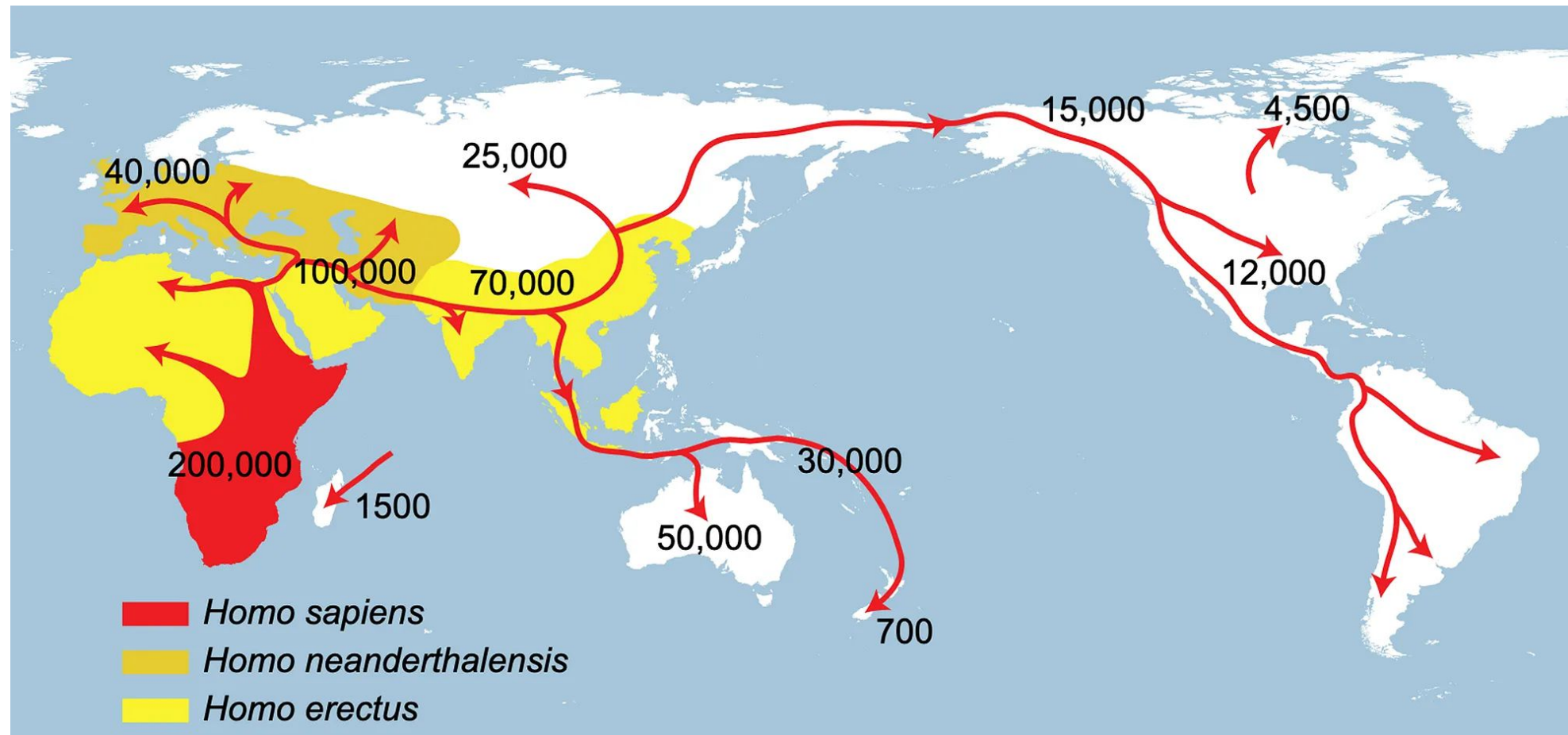


Research

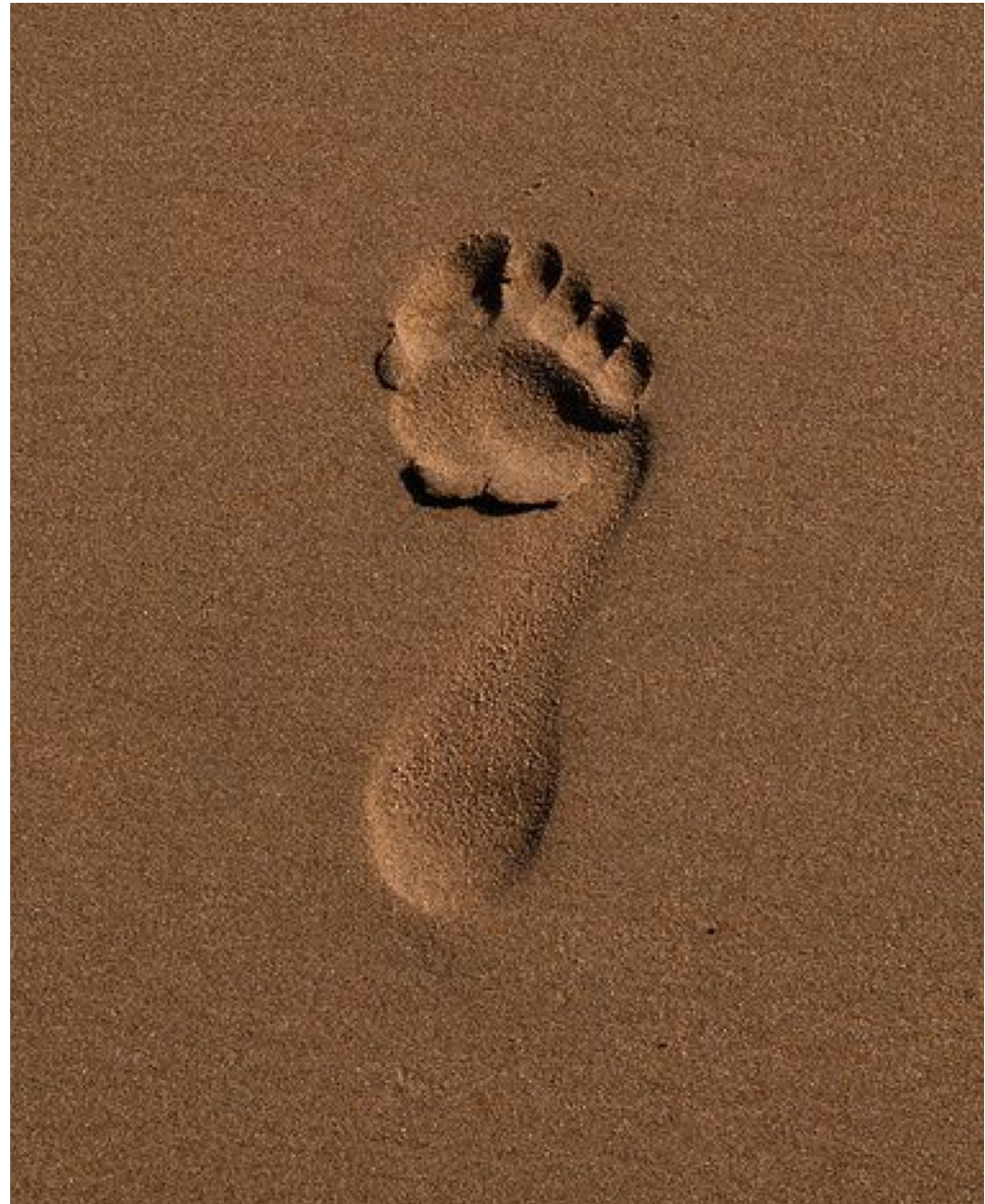
Cultural Research: Returning to the Origin of the Foot

The first project in this thesis explores the most fundamental state of footwear: the moment before shoes existed.

Anthropological research widely supports the “Out of Africa” theory, which proposes that modern humans originated in Africa approximately 200,000 years ago before migrating to other parts of the world. This makes Africa not only the birthplace of human civilization, but also the starting point of humanity’s relationship with the ground beneath our feet.



For thousands of years, human beings walked barefoot before footwear was invented. Even today, many African communities maintain a cultural tradition of barefoot movement, where the foot itself functions as the primary interface between the human body and the terrain.



The research stage began with the study of five historical footwear archetypes and their related cultural, environmental, and visual systems. For 000_Barefoot, the research focused on human origin, barefoot movement, and the body's direct relationship with the ground. Since the project references Africa as the starting point of human history, I also studied African architectural forms, jewelry, masks, and traditional graphic patterns. Rather than copying a single motif, I focused on the regularity of pattern systems found across these references.

These visual studies included both geometric and organic languages, such as dots, diamonds, triangles, square checkerboards, parallel zigzags, chevrons, circles, curved lines, waves, and spirals. These patterns became a visual foundation for developing the shoe's outsole and surface language. At the same time, the barefoot reference helped frame the design around the relationship between the foot and the ground, emphasizing direct contact, movement, pressure, and bodily origin.



Architectures



Accessories



Masks



Traditional Patterns

To bridge historical inspiration with contemporary references, I also studied modern barefoot footwear systems, including designs from the adidas archive and products such as Vibram FiveFingers, which attempt to replicate the biomechanics of barefoot walking.

These references helped establish a design direction where the shoe does not replace the foot, but rather extends its natural form.



adidas adipure Trainer

Vibram Fivefingers



Balenciaga

SKETCH



TOP VIEW

Among these variations, side-view options 2 and 5 emerged as the most promising directions. The final design balances these two approaches, integrating:

a barefoot-inspired forefoot structure

flowing structural lines

the Three Stripes reinterpreted as scar-like ridges

Rather than sitting on top of the shoe, the stripes flow across the entire form, traveling from the upper surface down toward the outsole. These raised ridges mimic the visual language of scarification, creating a continuous sculptural gesture that connects cultural reference with brand identity.



SIDE VIEW

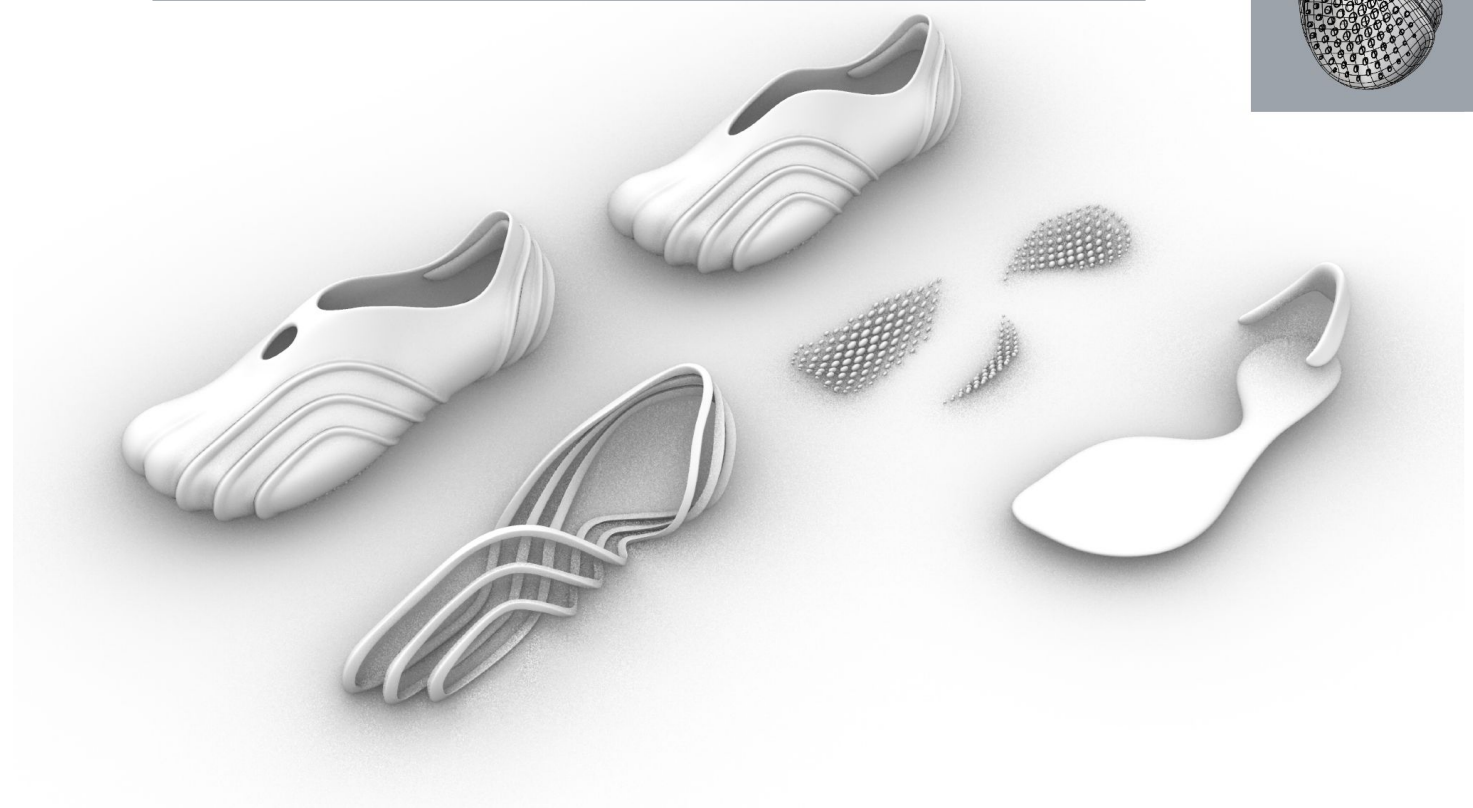
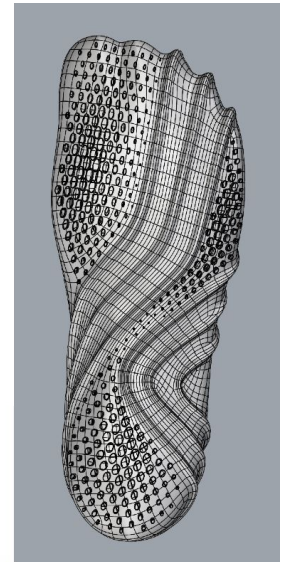
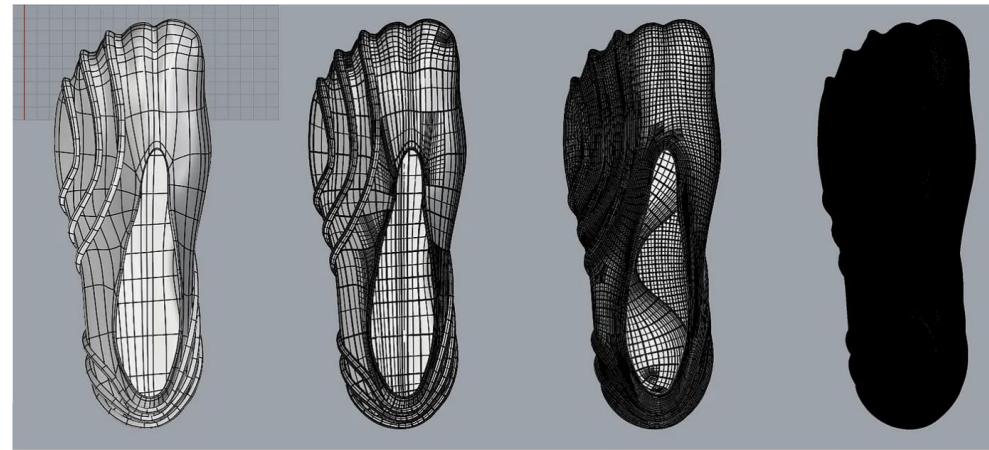
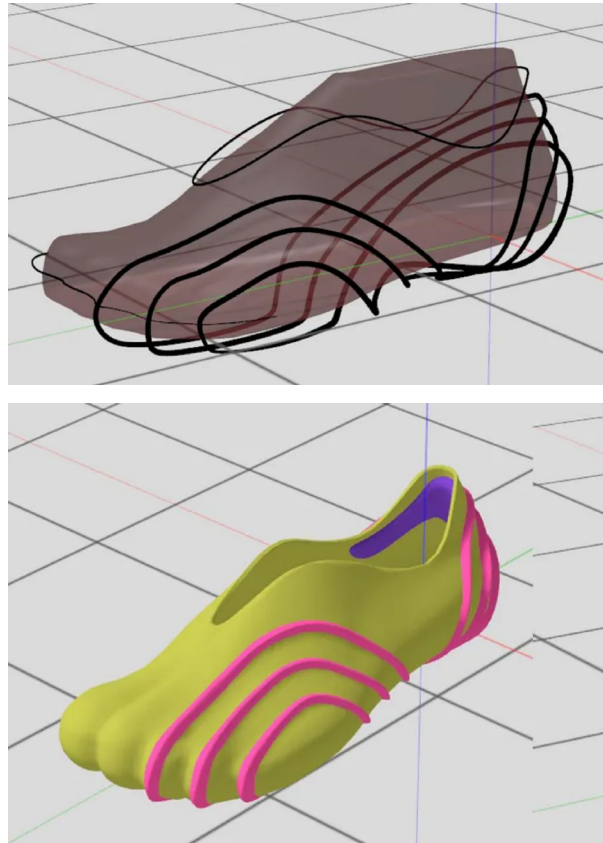


FINAL DECISION

Digital Modeling

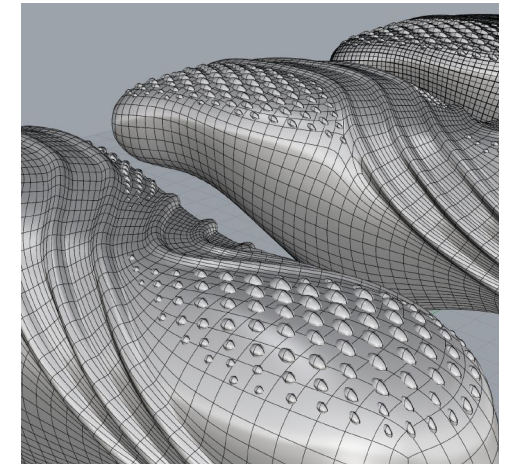
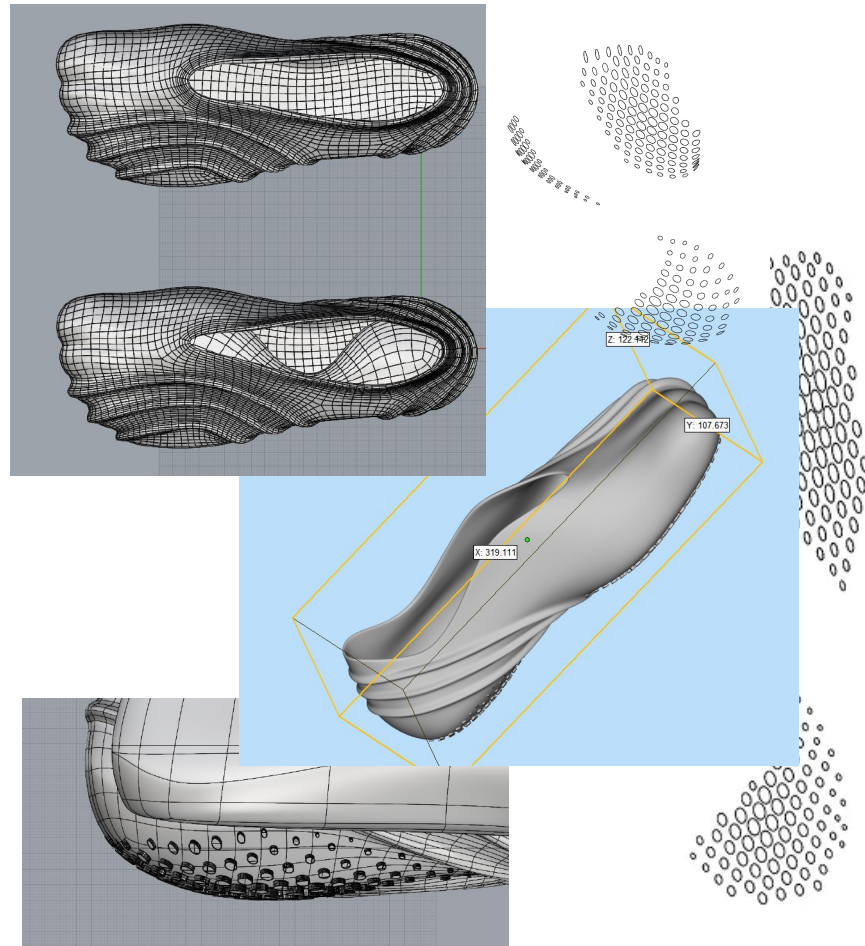
The digital development process began in Gravity Sketch, where the initial three-dimensional form was sculpted in VR.

Working in a spatial environment allowed rapid exploration of volume, curvature, and the integration of the Three Stripes as flowing structural elements. The model was then exported to Rhino, where the geometry was refined and optimized for fabrication.



For the outsole pattern, I translated the visual logic of African traditional pattern into a parametric dot structure. Using Grasshopper, circular elements were generated with gradual changes in scale and height, creating a pattern that transitions from dense to sparse across the surface.

This pattern allows the outsole to visually reference African traditional pattern while simultaneously functioning as a traction system.



Material Testing and 3D Printing

As the first physical prototype in this thesis, the Barefoot project also served as a testing ground for 3D printing workflows and materials.

The shoe was developed for a US 9.5 (275 mm last) and fabricated using FDM TPU printing. Several TPU materials were tested to evaluate flexibility, surface finish, and structural performance.

Three primary materials were compared:

Sanlu TPU

The material proved too rigid, resulting in insufficient flexibility for wearable comfort.

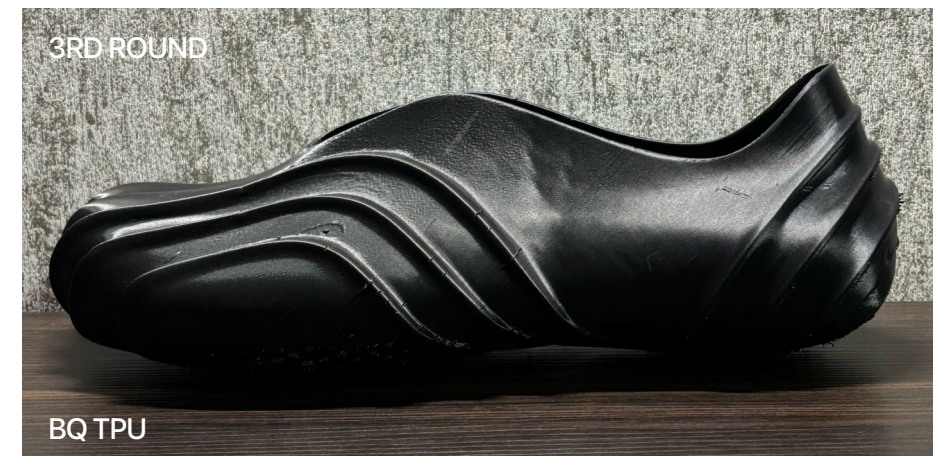
Bambu TPU

Although structurally functional, the surface finish was overly glossy, producing a plastic-like appearance that felt visually inexpensive.

BQ TPU

This material provided the most balanced result. Its surface sits between matte and reflective, producing a more refined and premium appearance while maintaining appropriate flexibility.

For these reasons, BQ TPU was selected as the final printing material.



Prototyping Iterations

The development process required nine print iterations.

The first three prints primarily focused on material evaluation and surface quality. Once the material was finalized, the following iterations addressed technical issues discovered during wear testing.

Several common problems emerged during early prototypes:

- stringing artifacts caused by TPU extrusion
- weak layer bonding
- insufficient structural density in the midfoot
- overly soft internal structures

Through iterative adjustments — particularly modifying internal density and structural distribution between the upper and outsole — these problems were gradually resolved.



Final Look

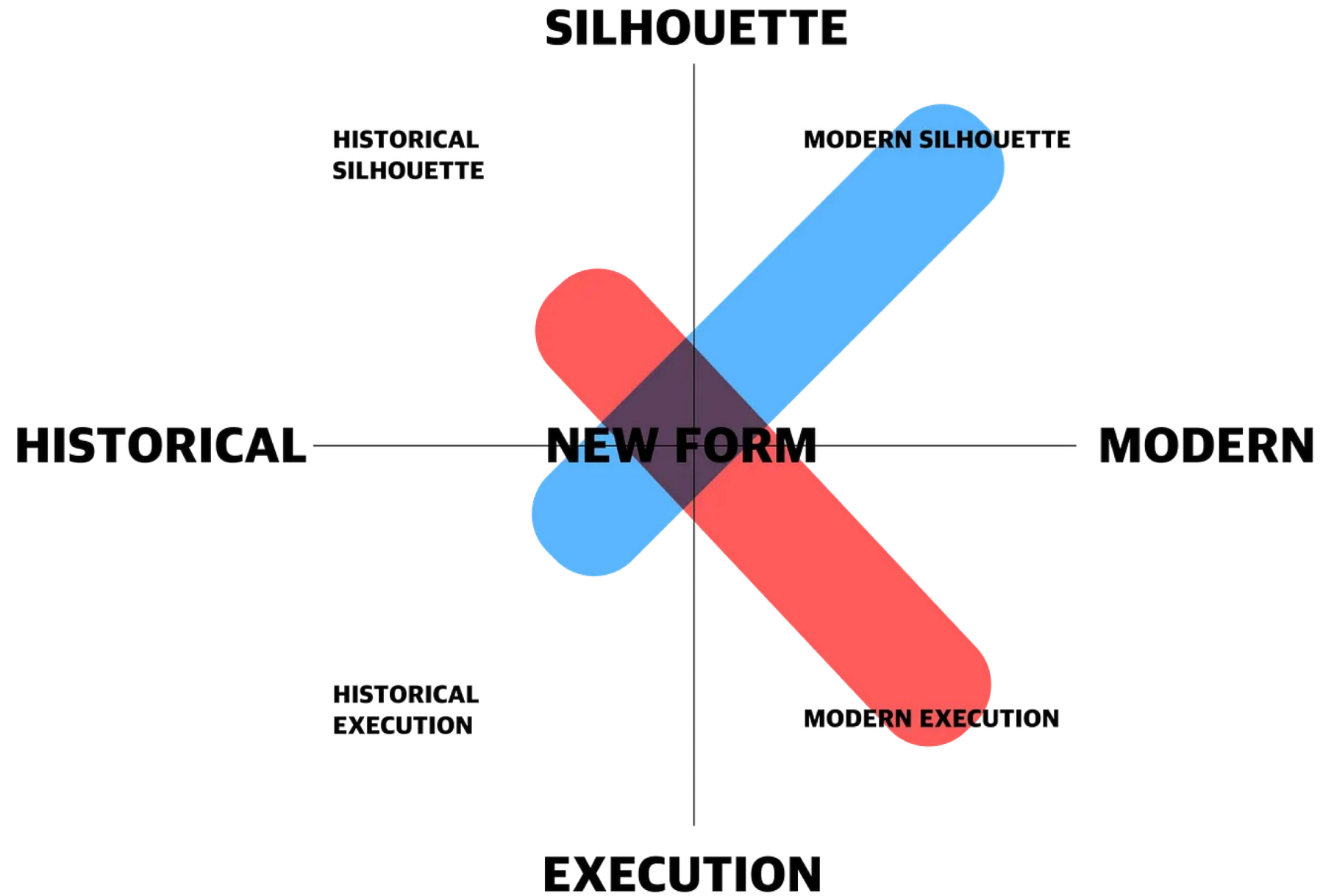


Final Look



LOOKBOOKS





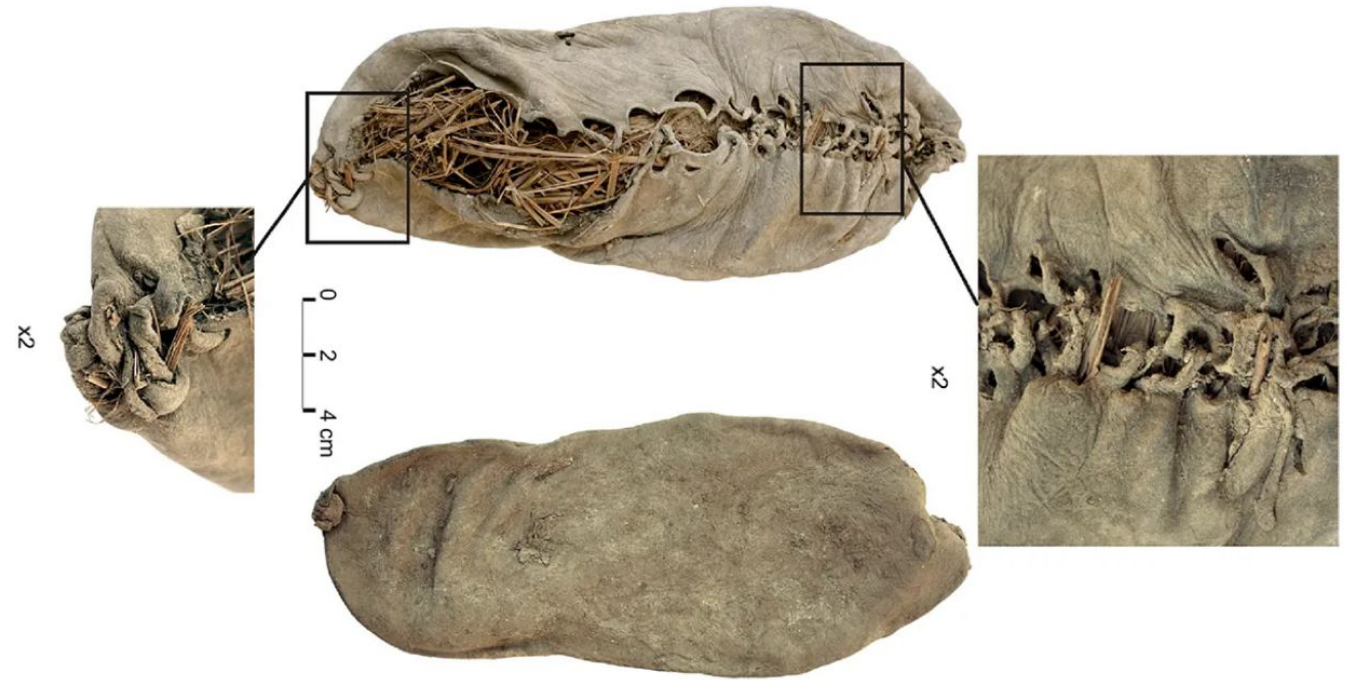
Research

Cultural Research: The Oldest Known Leather Shoe

The second project in this thesis references one of the earliest known examples of footwear ever discovered.

The Areni-1 shoe is a 5,500-year-old leather shoe discovered in 2008 in the Areni-1 cave in the Vayots Dzor province of Armenia. Preserved in remarkably good condition, it is considered the oldest known leather footwear discovered by modern researchers.

The shoe was constructed from a single piece of leather hide, wrapped around the foot and secured with leather laces. Its construction demonstrates an early understanding of how footwear could conform to the natural shape of the foot while remaining simple and efficient in material usage.



Areni-1

Oldest shoe ever found 5500 years ago



Early Stage

This project was originally explored during my first year graduate studio project, but for this thesis it has been revisited and significantly updated.



The new iteration introduces modern performance references from adidas archive, allowing the design to move beyond historical reconstruction toward a hybrid between ancient construction logic and contemporary footwear design.

Because the Areni-1 shoe was discovered in a mountain cave, the surrounding environment suggested a natural connection to mountain terrain and climbing activity.

This led to the introduction of climbing shoes as the modern design reference.



For this project I studied climbing footwear from the adidas Five Ten archive, as well as other contemporary climbing shoe designs.

Climbing shoes emphasize:

- precise foot wrapping
- aggressive toe curvature
- minimal layered construction
- friction-based rubber surfaces instead of patterned outsoles

Within the weighted design system, this project leans more heavily toward the modern silhouette of the Five Ten climbing shoe, while drawing structural and visual inspiration from the Areni-1 archetype.

Historical elements translated into the design include:

- organic perforations inspired by leather tension points
- curved openings extending toward the toe area
- simplified single-piece wrapping logic derived from the leather hide construction



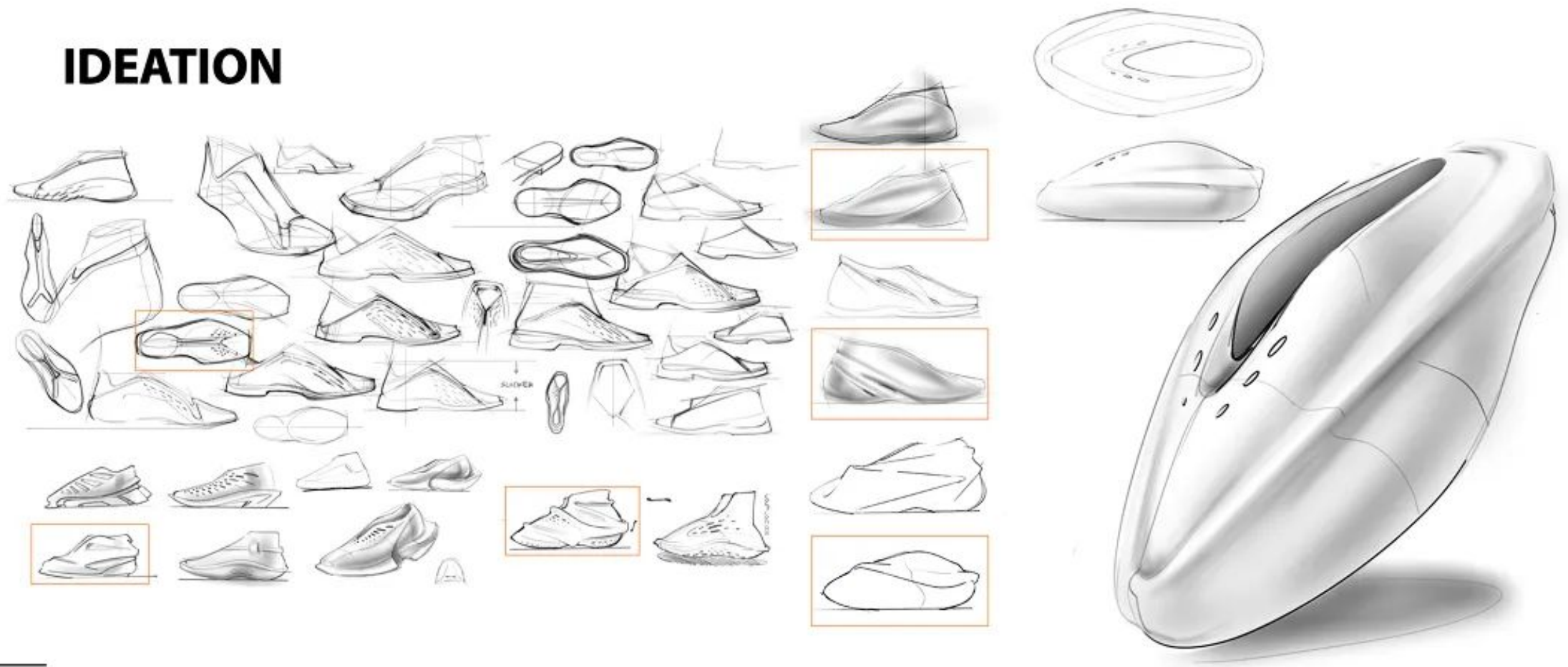
Silhouette of the Adidas 510
Execution from the Areni-1

Sketch

The sketch exploration phase documents the evolution of the concept from the Year 1 prototype to the updated thesis version.

In the initial sketches, the focus was primarily on translating the folded leather wrinkles of the Areni-1 shoe. These early concepts resulted in relatively chunky forms, emphasizing the material thickness and gathered leather construction of the archaeological artifact.

IDEATION



As the design evolved and the climbing shoe reference was introduced, the direction gradually shifted toward a slimmer and more performance-oriented silhouette.

Later sketches explored:

- tighter foot wrapping
- streamlined profiles
- perforated organic openings derived from leather
- tension points
- smoother continuous surfaces

This transition reflects a balance between archaeological inspiration and modern footwear ergonomics.



Digital Modeling

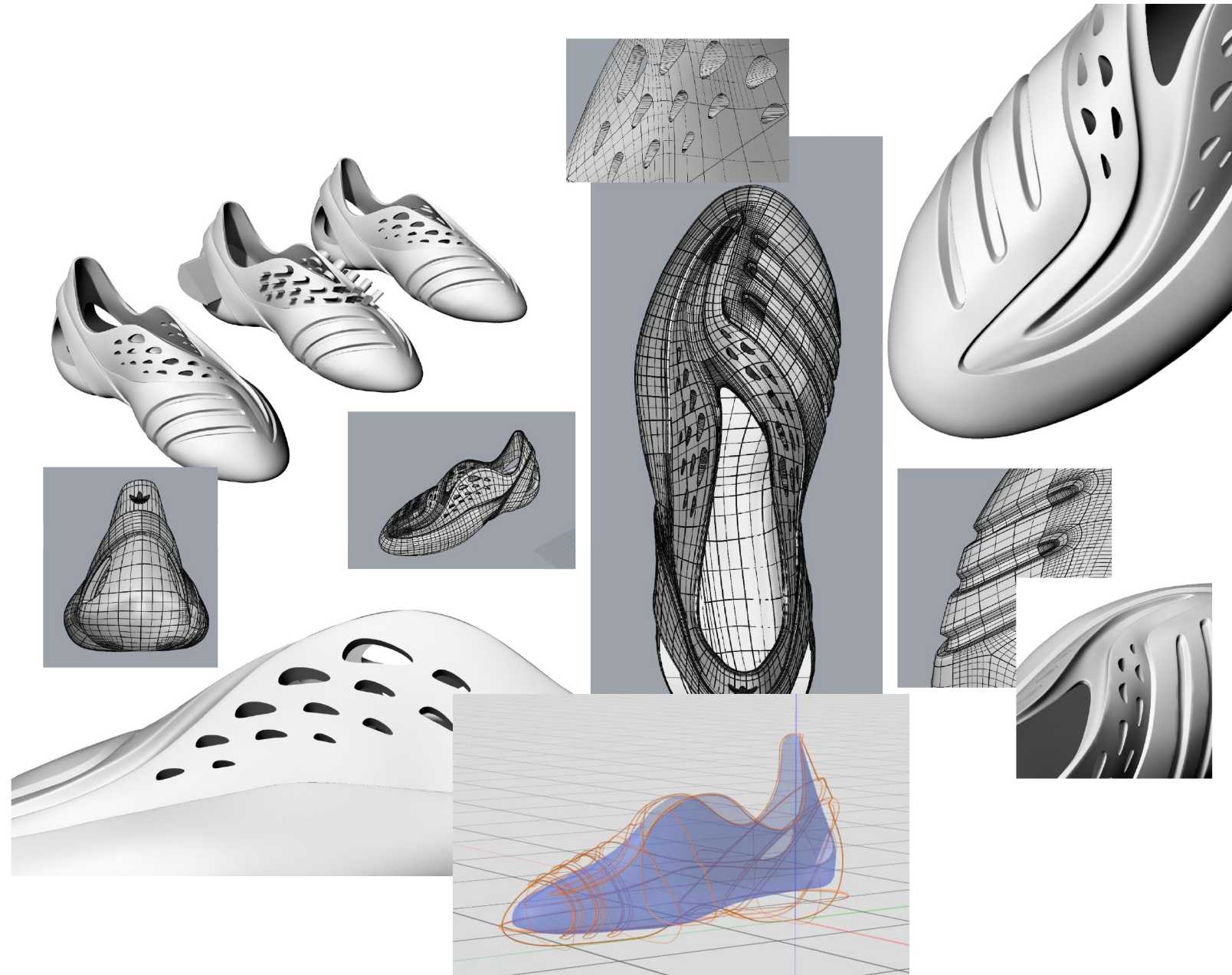
The digital modeling workflow follows the same pipeline established in the first project.

Initial form exploration was developed in Gravity Sketch, where the climbing-inspired curvature and wrapping geometry were sculpted in a VR environment.

The model was then exported into Rhino, where the geometry was refined and optimized for fabrication.

An interesting discovery during this stage was the shared simplicity between the Areni-1 shoe and modern climbing shoes. The Areni-1 artifact consists of a single leather piece without a structured outsole, while climbing shoes typically rely on smooth rubber surfaces rather than patterned traction.

Because of this similarity, the final design intentionally avoids introducing complex tread patterns. Instead, the outsole remains minimal and continuous, with a matte textured surface applied during the 3D printing process to increase friction while preserving the visual purity of the archetype.



Prototyping

The shoe is being developed at the same scale as the previous design:

US 9.5 (275 mm last)

and will be fabricated using FDM TPU printing.

001_Barefoot project provided an important technical foundation for this prototype. Through the Barefoot printing process, I gained a better understanding of how to prevent layer separation, tearing, and structural failure during FDM TPU printing.

For this iteration, I also switched to a new TPU material supplier, Sting. Compared with the previous TPU materials, Sting produced fewer stringing issues and reduced layer separation, while still allowing the shoe to be printed as a fully integrated form.

Because this design references climbing footwear, the outsole surface became an important area of experimentation. Instead of using a smooth TPU finish, I applied a rough granular texture to the outsole area. This decision not only supported the design language of a climbing-inspired shoe, but also increased surface friction, helping address the naturally slippery quality of TPU material.

The prototype was successfully printed after two iterations. In the first print, the internal structure around the toe flex area was too rigid, and the support density was too high, which created discomfort during walking. For the second print, I adjusted the internal density around the big toe flex zone, allowing the shoe to bend more naturally during movement. This adjustment significantly improved the wearability of the prototype and helped balance structural support with flexibility.



Reflection

Revisiting the 002_Areni 510 concept allowed the design to evolve from a historical reinterpretation exercise into a more integrated footwear exploration.

By introducing adidas Five Ten climbing shoes as a contemporary reference, the project now operates as a dialogue between:

an archaeological footwear archetype
a modern performance silhouette

Rather than replicating the ancient shoe, the design uses the Areni-1 artifact as a conceptual starting point, translating its construction logic and material simplicity into a new form through digital modeling and additive manufacturing.

This approach continues the broader thesis goal:
to treat historical footwear not as objects to reproduce, but as design inputs capable of generating new contemporary forms.

Final Look

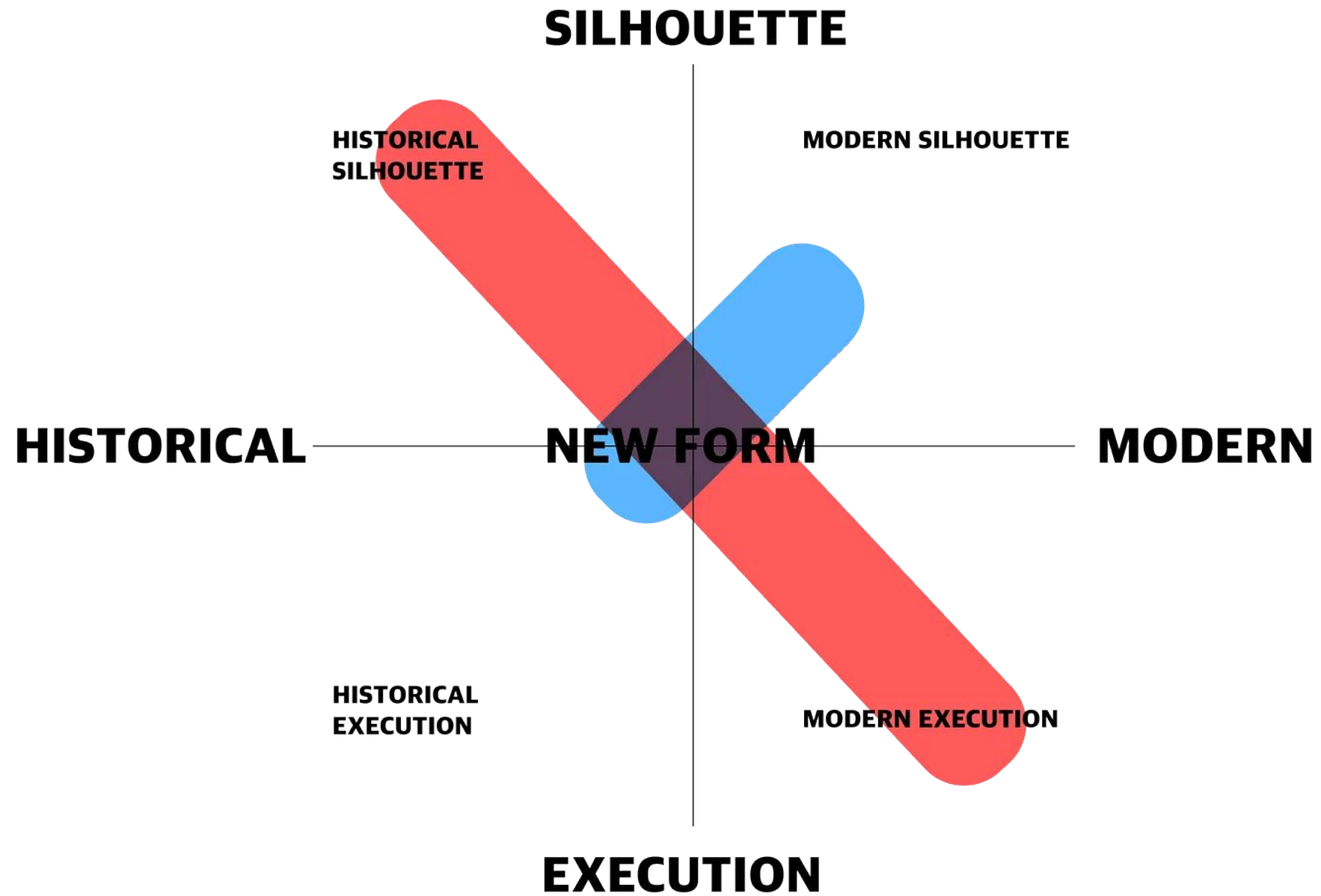


Final Look



LOOKBOOKS





Research

Inuit Mukluks and Extreme Weather Design

Mukluks are traditional winter boots developed by Inuit communities living in Arctic environments. These boots are specifically designed for extremely cold climates and long-distance walking on snow and ice.

The structure of mukluks typically consists of three functional layers. An inner boot sits close to the foot for warmth and comfort, while an outer layer provides insulation and protection from the environment. The outsole is usually made from sealskin leather, which is dried, softened, and wrapped around the foot.

One distinctive feature of mukluks is their wrapped sole construction. Instead of placing the seam on the bottom edge of the sole, the leather is wrapped upward so that the seam sits along the upper sides of the boot. This prevents leaks and reduces wear during long-distance walking on ice.

Because mukluks are extremely lightweight, they usually require little or no lacing. Many designs intentionally avoid tight lacing to prevent constricting circulation, which could cause the foot to become colder.



Inner Layer



Out Layer

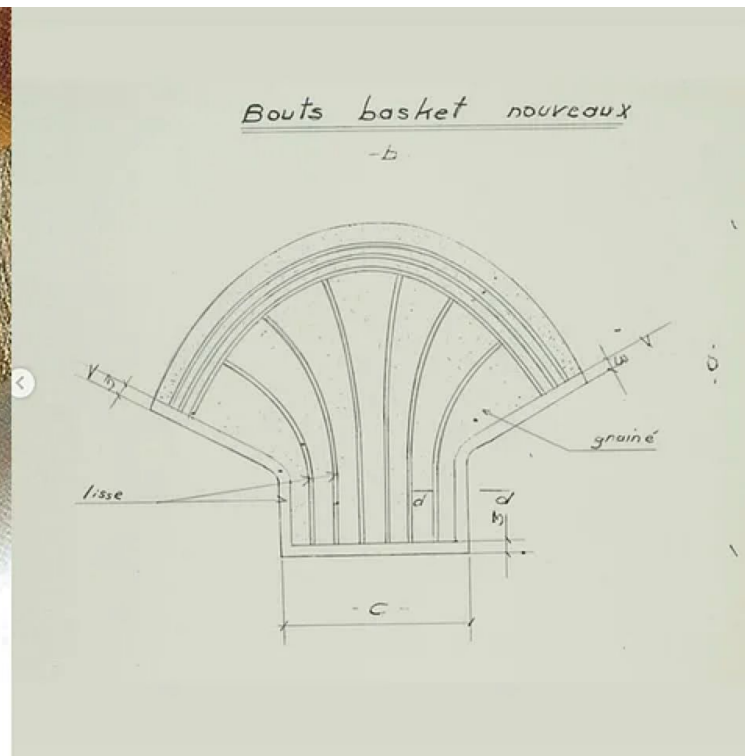


Outsole



Another fascinating construction detail relates to the sealskin outsole. To soften the leather and allow it to flex naturally while walking, Inuit makers traditionally chew the sealskin before shaping it. This process creates a characteristic wrinkled texture across the toe area.

This wrinkled folding pattern strongly resembles the radial shell pattern of the adidas Superstar toe cap, which became one of the conceptual bridges between the historical reference and the modern archive reference.



Visual Language and Cultural Pattern References

During research into Inuit clothing and footwear, I also observed that many traditional garments feature large geometric compositions, often composed of bold straight lines and simple shapes. These visual patterns are not overly decorative but instead rely on strong structural graphics and high contrast material arrangements.

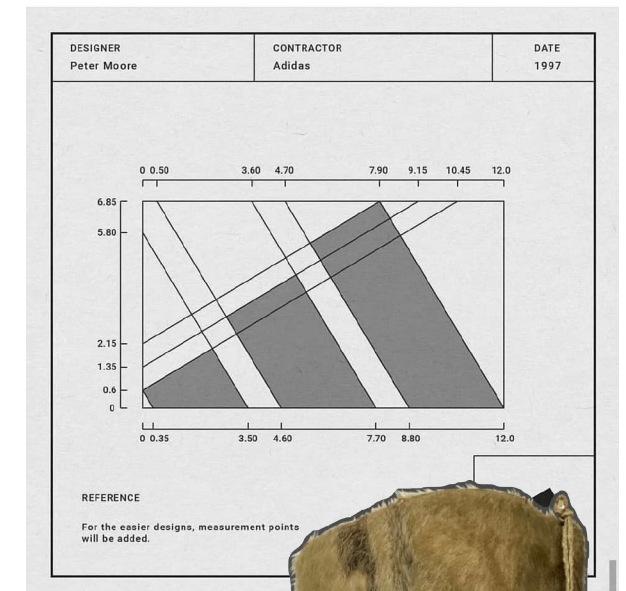
This visual logic resonates with one of the most recognizable elements in adidas design language: the three stripes. Rather than directly copying traditional motifs, this project explores how the structural simplicity of Inuit garment graphics can be conceptually combined with the adidas stripe system.

Key Functional Characteristics

From the research phase, several core principles of mukluk design emerged:

- Designed for extreme weather environments
- Optimized for walking or running on snow and ice
- Laceless or minimal lacing to maintain circulation
- Wrapped outsole construction
- Waterproof material systems
- Multi-layer assembly

These characteristics became the functional foundation for the design reinterpretation.



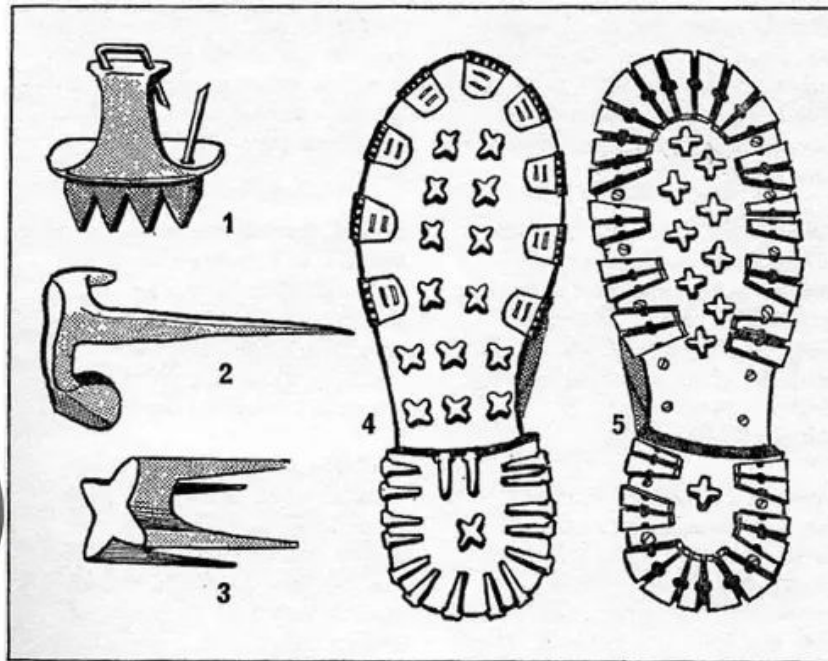
Modern References — Outdoor Footwear Systems

Because mukluks were originally designed for extreme environments, I explored several modern outdoor footwear systems as technical references.

These included aggressive traction systems and winter boots structures found in mountaineering and winter footwear, such as designs from outdoor brands including Arc'teryx, Salomon, and the Yeezy 1050 boot.

These contemporary references helped inform how traction systems could be reinterpreted while still maintaining the recognizable design language of the adidas Superstar outsole.



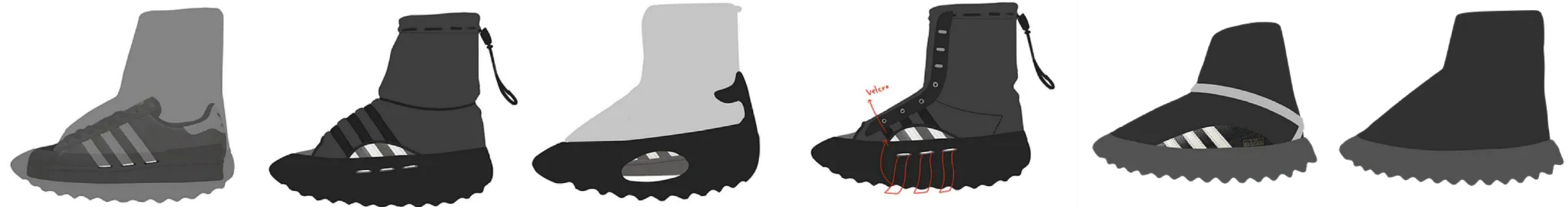


Nails and Vibram soles. (1) Tricomi Nail (2) Clinker Nail (3) Mugger Nail (4) a typical nailing pattern with Tricomi edge nails and Muggers on the sole and Clinker edge nails on the heel (5) Vibram sole and heel.



Sketch

The design exploration began by combining the structural logic of mukluks with the tooling of the adidas Superstar. The Superstar outsole was selected as the base structure, while the upper was redesigned to reinterpret the layered mukluk construction.



Inner Layer



Out Layer



Outsole

The inner boot layer is imagined as a modern neoprene sleeve, which provides a close-fitting structure around the leg. The outer layer builds a softer, more padded volume inspired by traditional fur-lined mukluks.

Instead of traditional lacing systems, the design maintains the laceless philosophy of mukluks. A single elastic cord at the top of the boot helps secure the boot around the leg while allowing circulation and ventilation.

The heel structure incorporates a raised thermoformed panel that merges traditional Inuit garment graphics with the adidas three-stripe language. The outer shell is envisioned as a waterproof nylon construction with insulated padding to reinforce the winter performance context.



Neoprene



Puffy Nylon



Full Version

Outsole Design

One of the key design experiments was the reinterpretation of the traditional mukluk wrapped outsole.

The outsole was designed as a detachable external structure that wraps around the Superstar tooling. The internal shape follows the exact geometry of the Superstar outsole, allowing the component to lock onto the base tooling. The toe area references the wrinkles formed in traditional sealskin soles. In this reinterpretation, the folds are simplified into five raised ridges, connecting visually to the five shell ridges found on the Superstar toe cap.

Early outsole sketches referenced the original Superstar tread pattern, which includes wave-like zigzag textures. Later iterations evolved toward a more aggressive outdoor traction system using sharper cleat-like forms, inspired by mountaineering footwear.

This approach allowed the outsole to maintain the DNA of the Superstar while introducing a contrasting technical character appropriate for winter environments.



Development Collaboration with adidas

During the second semester of this thesis project, I contacted the Design Vice President I had previously worked with during my internship at adidas headquarters. She invited me to visit the adidas CCLA headquarters, where I had the opportunity to discuss this project with the development team.

Because this design involves both textile development and tooling experimentation, I prepared a full technical package for the team to review. The discussion provided valuable insights into materials, construction feasibility, and development considerations.



UPPER SEWING

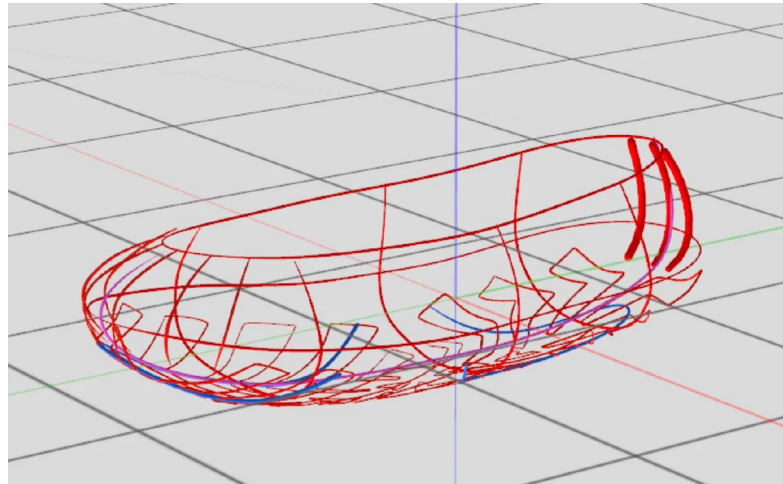




Digital Modeling and Prototyping

The outsole was first modeled in Gravity Sketch to establish the overall geometry and proportions. The model was then transferred into Rhino for detailed refinement.

To ensure a precise fit with the Superstar outsole, I initially attempted to scan the original shoe using a mobile scanning application. However, the accuracy was insufficient for production-level modeling. Instead, I downloaded a digital model of the Superstar and imported it into Gravity Sketch. Using the model as a reference, I rebuilt the outer structure along the edges of the original outsole.



1ST ROUND



FINAL ROUND

The first printed prototype fit loosely and detached during walking. After analyzing the tolerance, I adjusted the model by offsetting the internal surface inward by 2 mm. The second iteration produced a significantly tighter and more stable mechanical fit. I also connect 3 stripes from heel to the outsole pattern on the second trial to make it look more unified with outsole pattern, instead just branding alone.

The outsole prototypes were produced using FDM TPU printing, allowing flexibility while maintaining structural integrity.



1ST ROUND



2ND ROUND

FINAL LOOK



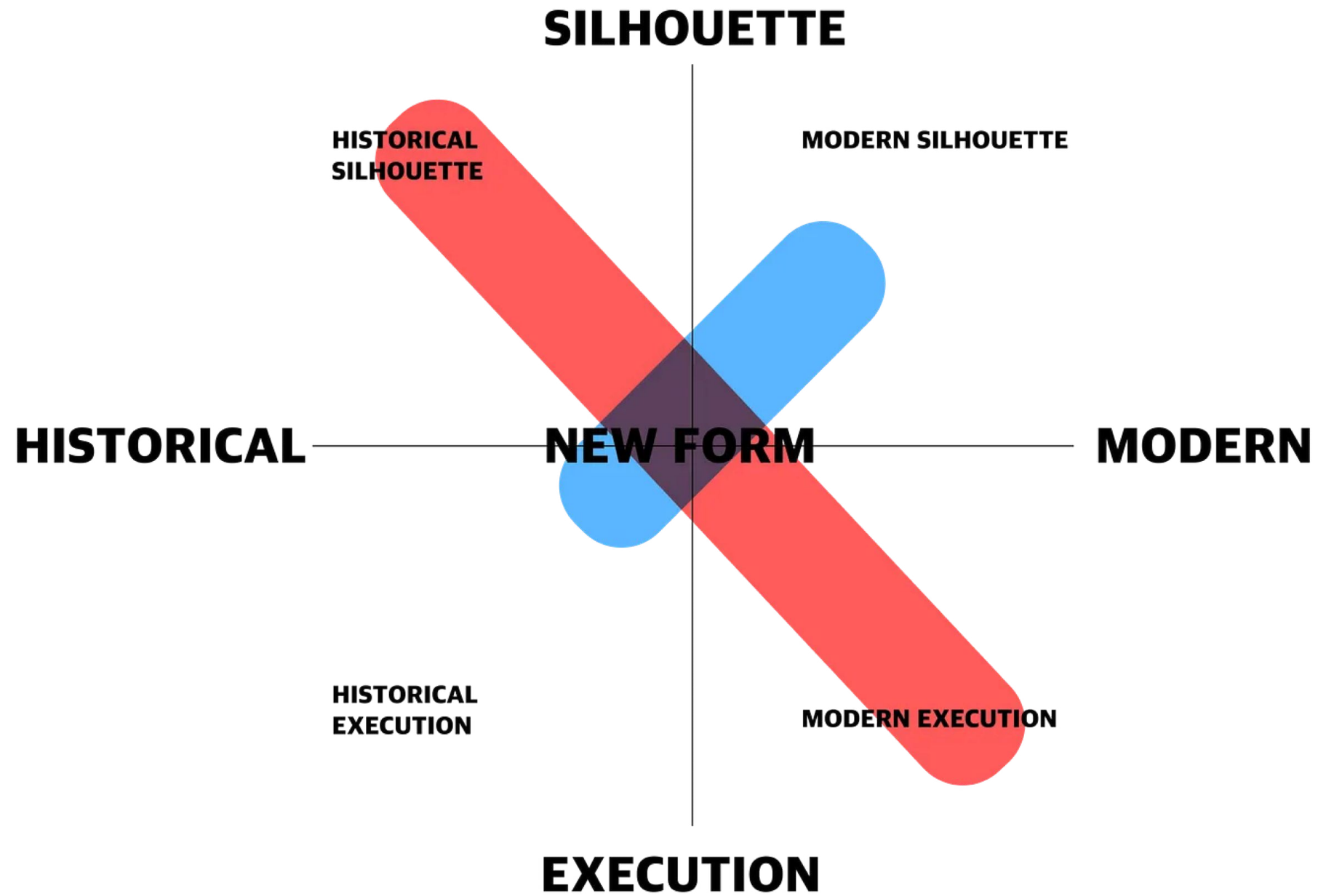
FINAL LOOK



FINAL LOOK



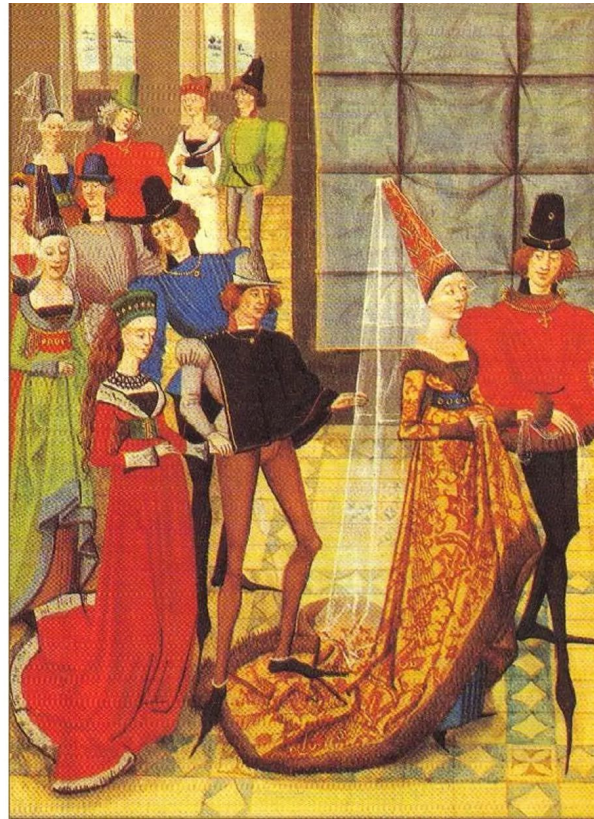




Reaserch

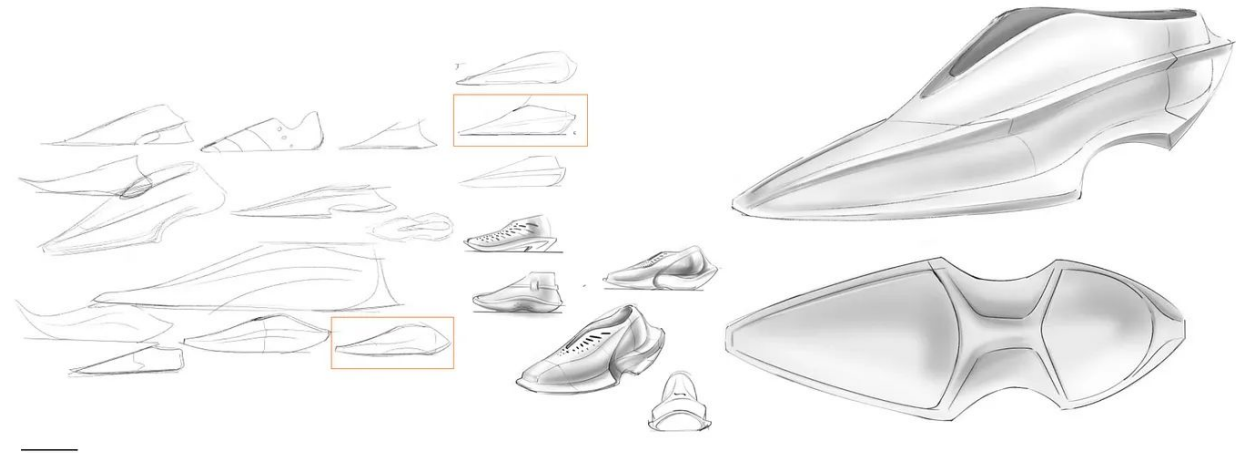
This project builds on a design study I began during the first year of the program, focusing on the exaggerated pointed footwear commonly worn by European aristocracy during the medieval and Renaissance periods.

These shoes, often referred to as poulaines, were characterized by their dramatically elongated toe shapes. Historical paintings and preserved museum examples reveal that these shoes were not only fashion statements but also markers of social status. Through studying historical oil paintings and museum collections, it became clear that these medieval silhouettes strongly influenced the development of many modern pointed footwear forms. Contemporary fashion shoes and formal dress shoes often inherit proportions and toe shapes that originated from these historical archetypes.



In my first-year project, the design exploration focused primarily on directly interpreting the historical silhouette. For this thesis iteration, I aimed to move beyond historical reproduction and instead explore how this archetype could merge with modern footwear design language.

IDEATION



Modern References

To introduce a modern design layer, I studied contemporary loafers as the primary reference.

Loafers offer several structural features that can be reinterpreted and simplified into a modern silhouette. These include:

- the strap detail on penny loafers
- the two-piece construction between tongue and quarters
- raised edge piping around the upper panels
- the clean horizontal collar line

These elements provide opportunities to reinterpret traditional shoemaking structures as a more integrated and minimal form.



To further enhance the fashion-forward character of the design, I also referenced a classic couture footwear construction known as the fiddle waist. This sculptural waist section of the outsole creates a narrow midfoot profile and is often used in high-end formal footwear to emphasize elegance and craftsmanship.



Sketch

While much of the research and structural reference was rooted in traditional shoemaking, I wanted the final design to introduce a visual contrast.

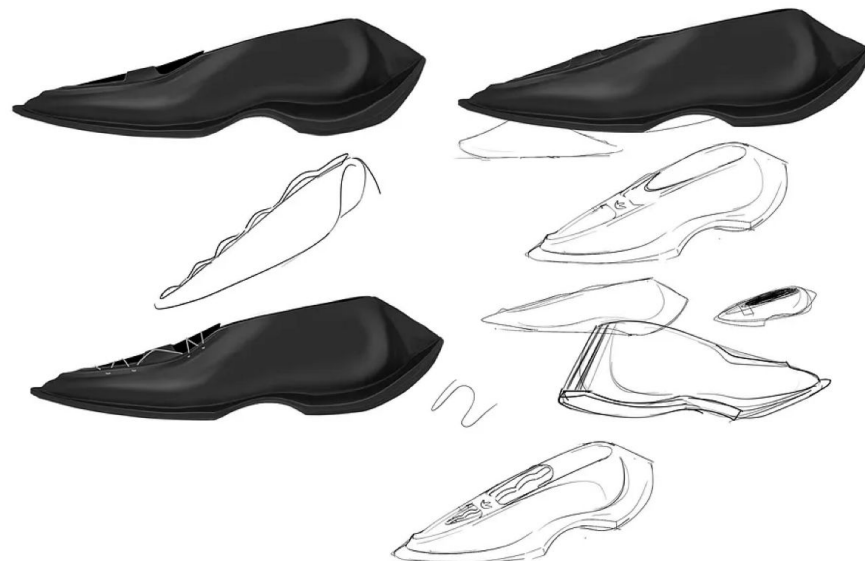
To balance the strong historical references, the overall sketch exploration moved toward more futuristic and dynamic forms. The proportions emphasize speed, sharpness, and motion rather than purely historical elegance.

One early challenge involved the loafer tongue construction. Reproducing the traditional tongue structure in a single 3D printed material proved difficult, as thicker printed geometry around the tongue could create discomfort or pressure on the foot.

Several iterations explored combining printed structure with textile or leather components to create a more flexible tongue.

However, after further exploration I decided to maintain the laceless loafer identity, simplifying the tongue geometry and integrating it into a unified printed upper form.

Another design decision involved extending the adidas three-stripe language into the outsole geometry, allowing the stripes to continue across the entire sole and wrap toward the heel.



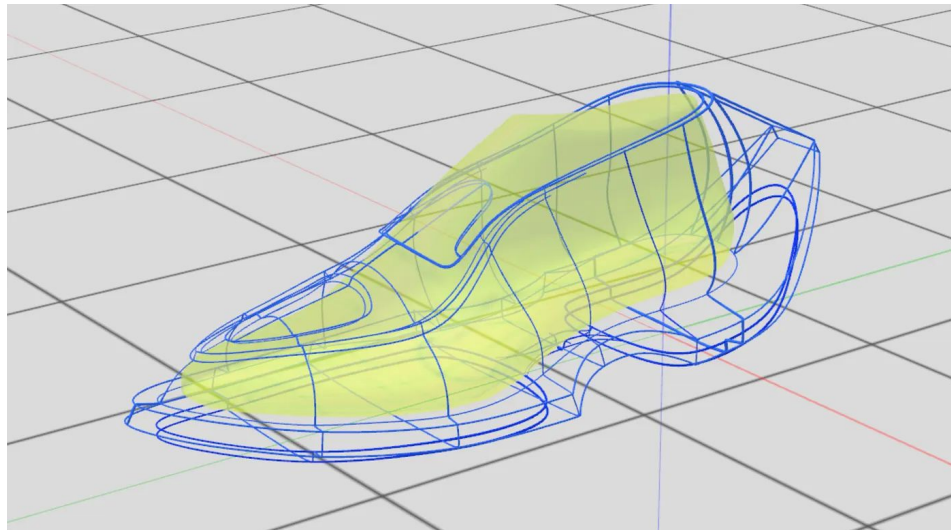
Digital Modeling

The digital modeling process began in Gravity Sketch, where the primary silhouette and proportions were developed in three-dimensional space.

The model was then exported into Rhino for further refinement, including surface cleanup, curvature adjustments, and structural detailing.

Two variations were developed during the modeling stage. The first version retained the straight collar line typical of traditional loafers. The second version introduced a more curved collar profile, inspired by athletic footwear, to reduce pressure around the ankle and improve comfort.

Another design detail incorporated during modeling was the use of zigzag-edged three stripes along the sidewall. This reference draws from retro adidas Originals archive elements and helps reinforce the connection between futuristic geometry and heritage design language.



Loafer Collar



Sneaker Collar

Prototyping

The prototypes were produced using FDM TPU printing, allowing the structure to maintain flexibility while preserving the sharp geometry of the design.

The printed upper demonstrated a high level of structural integrity and surface quality. However, challenges appeared in the lower support areas during printing. Some sections where the shoe contacted the support structures developed rough surfaces and small structural break points.

These issues will require further experimentation with material settings and printing orientation in future iterations.

Despite these technical limitations, the prototype successfully demonstrates the core design concept: a hybrid silhouette that merges the exaggerated pointed geometry of medieval footwear with contemporary loafer structures and adidas design language.

This project explores how historical fashion silhouettes can be reinterpreted through contemporary footwear language, creating a dialogue between heritage craftsmanship and speculative form.



FINAL LOOK



FINAL LOOK

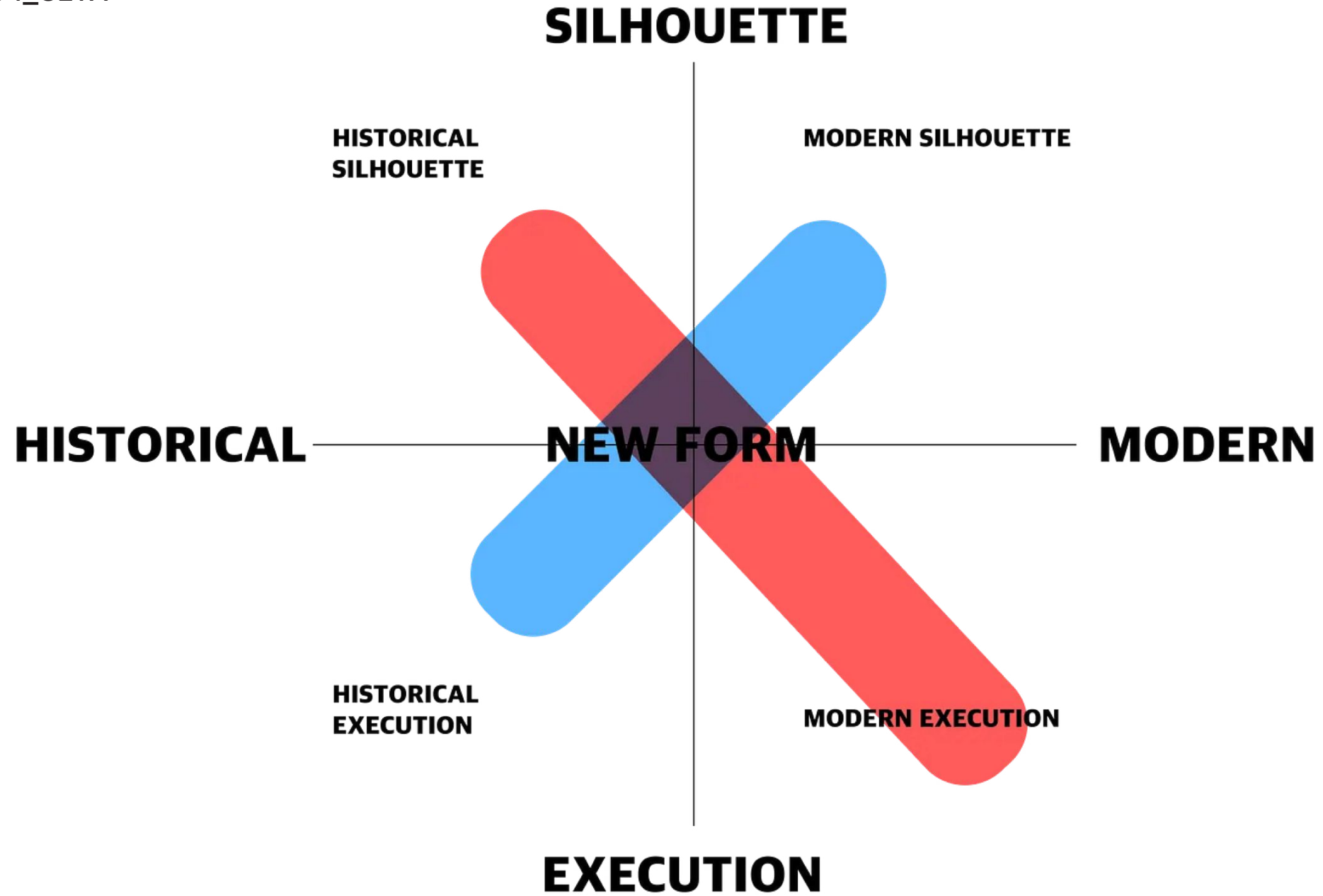


FINAL LOOK



LOOKBOOKS





Reaserch

Geta are traditional Japanese wooden sandals that have been worn for centuries, particularly during the Edo period and earlier. They are commonly associated with kimono and traditional clothing, and were designed for practical as well as cultural purposes.

One of the key reasons for the development of geta was environmental. Japan's climate often includes rain and wet streets, and the elevated wooden platform of the geta helps lift the foot above mud, water, or snow. The raised base also improves ventilation and keeps the foot dry. Geta are typically constructed from a single block of wood, carved into a flat platform supported by two vertical wooden teeth known as ha. A simple fabric thong strap called the hanao passes between the big toe and second toe, securing the sandal to the foot. What makes geta particularly interesting from a design perspective is their extreme structural simplicity. The form is composed of very clear geometric volumes: flat planes, sharp vertical cuts, and minimal material transitions.

These qualities made geta an ideal archetype for reinterpretation through modern digital fabrication.



Modern References

While the historical reference for this project is the wooden structure of geta sandals, the modern reference comes from the silhouette of high heels.

High heels represent a very different visual language from geta. Where geta emphasize wide, blocky, and architectural forms, high heels often focus on elegance, curvature, and slender proportions. This project explores the tension between these two opposing design languages.

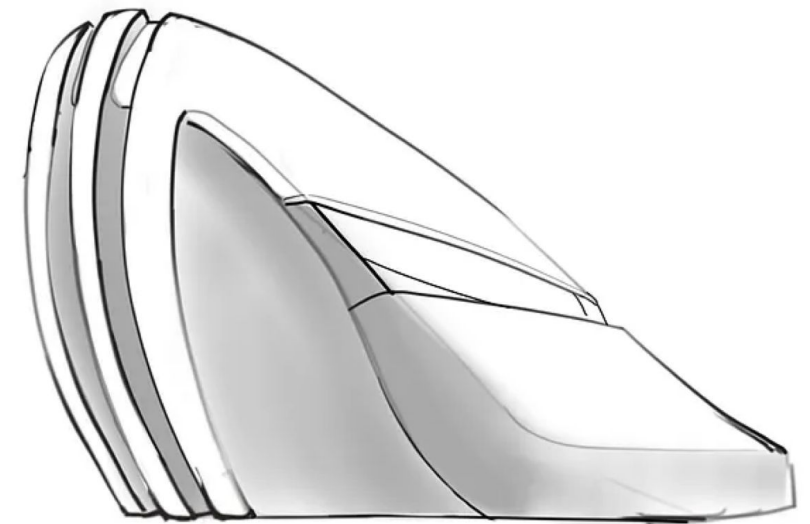
Notably, this is the only design in the series that specifically focuses on women's footwear, allowing the reinterpretation of the geta archetype through a more sculptural and feminine silhouette.



Early sketch explorations attempted to reinterpret the geta thong strap by dramatically enlarging the strap structure. The idea was to extend the strap geometry from the toe area all the way to the heel, transforming it into a structural component of the shoe.

In these early iterations, the extended strap geometry would also form the heel structure, creating a continuous visual flow that connects the strap, heel, and outsole.

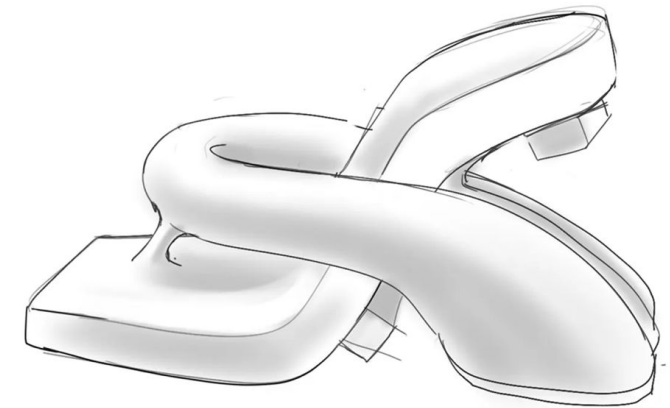
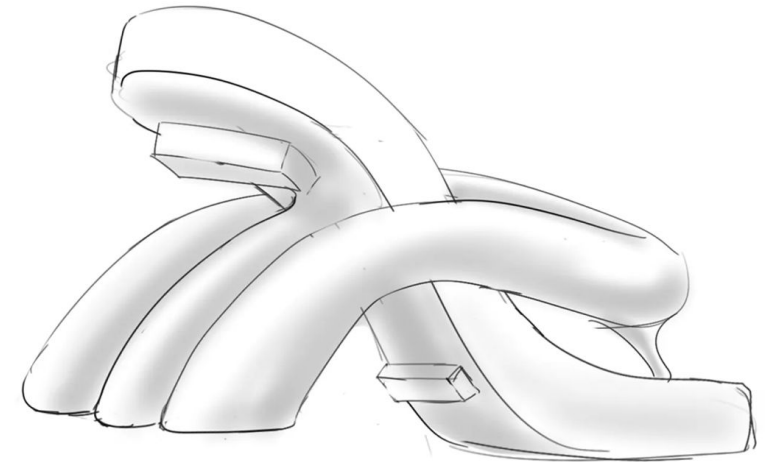
However, this approach created ergonomic issues. The enlarged strap geometry frequently intersected with the ankle area, which would likely create discomfort when worn. Additionally, the design began to resemble a modified high heel rather than a reinterpretation of geta.



To address this, the design direction shifted back toward the structural language of geta itself. Instead of focusing primarily on high heel forms, I began analyzing the geometric logic of the wooden geta structure — particularly the sharp edges, flat planes, and vertical cuts created by woodworking processes. These straight-edged geometries were then combined with the smoother, more organic curves typically found in high heel silhouettes.

Another key design element was the reinterpretation of the thong strap. The strap extends toward the rear of the shoe and transforms into a structural heel component. Together with the central heel support, this creates a visual composition reminiscent of the adidas three-stripe language.

In a simplified sense, the design can be understood as bending the platform of a wooden geta into the shape of a high heel, while extending the thong strap into a structural heel element.



Digital Modeling

The model was refined in Rhino, where the geometry was adjusted to balance two opposing design languages: the sharp, architectural edges of wooden geta and the smoother curvature of high heel forms.

During this stage, multiple iterations of the thong strap geometry were explored. The challenge was to keep the strap visually expressive while ensuring it would not interfere with the foot.

To achieve this balance, the strap geometry was gradually softened and rounded, creating a more fluid shape that enhances the feminine character of the shoe while still maintaining the structural contrast with the angular base.



Prototyping and Material Experiments

Unlike flat footwear, high heels require significant structural support. TPU printing offers flexibility, but its softness makes it difficult to maintain stability in tall heel structures.

As an early experiment, I attempted to print the shoe using PLA, which provides greater rigidity. However, PLA lacks flexibility and therefore has poor wearability.



This led to a new strategy focused on internal structural density control. By adjusting the internal infill density of different areas within the print, I attempted to create varying levels of stiffness across the shoe.

For example:

The thong strap area requires softness for comfort against the foot

The footbed requires moderate flexibility

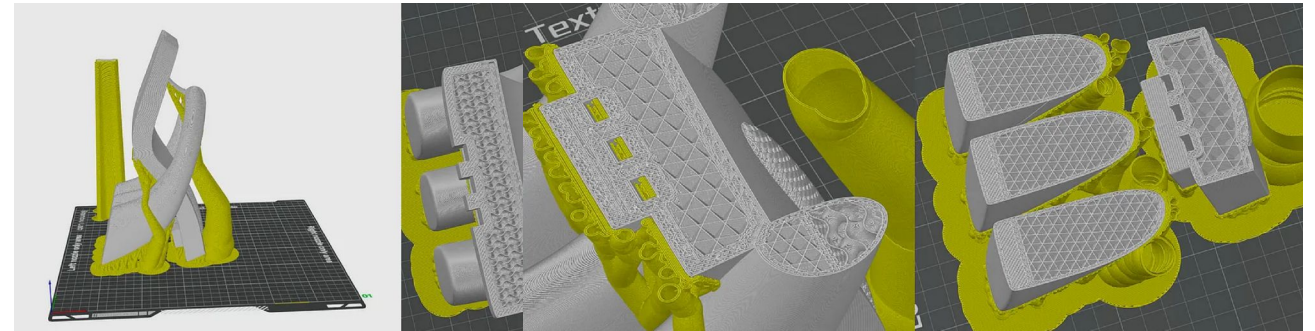
The outsole and heel require significantly higher structural stiffness

The first TPU prototype was printed using BQ TPU, but the material did not provide enough structural stability for this design. Two early prototypes failed because the density around the thong strap area was insufficient, causing layer separation and structural breaks.

In the next round, I switched to Sting TPU, the same material used in later iterations of 002_Areni-510 and 004_MDVL. Compared with BQ TPU, Sting demonstrated significantly better structural consistency, stronger layer bonding, and improved surface quality. The whitening marks caused by support material were also reduced, which helped the prototype appear cleaner and more refined.

After switching to Sting TPU, I also separated the surface treatment into two material finishes: a smooth surface and a rough granular texture. This helped create more visual depth and detail across the shoe, while also making different structural areas feel more intentional.

This material shift improved the balance between flexibility and support. While the strap and footbed could remain soft enough for wearability, the outsole and heel areas could be reinforced through higher-density internal structures. Future iterations will continue testing this material strategy to further improve heel stability, comfort, and long-term durability.



FINAL LOOK



FINAL LOOK



LOOKBOOKS



LOOKBOOKS



7. AIGC Workflow

7.1 000_BAREFOOT

The visual development of the 000 lookbook was constructed around a “primitive–future” narrative, in which the body functions as the starting point for both the styling and the footwear presentation.

Since the shoe itself was derived from barefoot movement, body-ground connection, and abstracted dotted pattern language referenced from African architecture and traditional graphic motifs, the garment direction was intentionally kept close to the body.

For the model casting direction, I selected a female character with long braided hair, using the hairstyle to reinforce the cultural atmosphere of the concept while maintaining an elegant and mysterious visual presence.

I first established the outfit as a second-skin silhouette: a black full-body garment extending to the fingers, rendered with a smooth rubber-like surface to emphasize a sense of protection, tactility, and bodily continuity. To introduce a more futuristic and functional contrast, I paired this bodysuit with loose nylon trousers. Perforated dot patterns were applied to the pants as a visual translation of the project’s pattern research, allowing the look to connect back to the shoe without directly repeating it.



The mask was designed as an additional AIGC-generated accessory to strengthen the speculative tone of the lookbook. Its form incorporated three rounded raised ribs that echoed the shoe's sculpted stripe language, while a slightly glossy finish increased the sense of futuristic artificiality.

Throughout the image-generation workflow, the shoe remained the primary subject, and the clothing, mask, and styling were developed as supporting systems that amplified its narrative. Multiple rounds of prompting and refinement were used to stabilize the model identity, garment proportions, accessory form, and overall tonal consistency, resulting in a lookbook image set that positioned the footwear within a coherent speculative fashion context rather than presenting it as an isolated product.



7.2 001_ARENI 510

For the 001_Areni-510 lookbook, the visual direction was built around the idea of excavation, preservation, and scientific discovery. Since the original Areni-1 shoe was discovered inside a cave as an archaeological artifact, I wanted the styling to create a stronger contrast between the ancient reference and a contemporary research context. Instead of attempting to recreate an imagined ancient human figure, I chose to frame the look through the language of an archaeologist or field researcher, using protective laboratory clothing as the main styling reference.

The outfit was developed as a black full-body protective suit, combining the feeling of an excavation uniform, laboratory wear, and futuristic field gear. This direction allowed the lookbook to connect directly to the origin story of the shoe: an object buried in the past, recovered through contemporary archaeological methods, and reinterpreted through modern footwear design. The gas mask further strengthened this relationship by introducing a sense of protection, mystery, and controlled environment. It also helped shift the image away from a literal historical reconstruction and toward a more speculative visual world.

This styling choice also supports the design logic of 001_Areni-510 itself. The shoe blends the ancient leather-wrapping structure of the Areni-1 artifact with the performance language of modern climbing footwear. Similarly, the lookbook combines archaeological references with a futuristic protective silhouette. The black monochrome palette keeps the focus on form, surface, and proportion, while the technical suit echoes the shoe's streamlined, performance-driven direction.

Through the AIGC workflow, the model, outfit, and atmosphere were generated to support the shoe rather than compete with it. The final image positions 001_Areni-510 as an object between excavation and performance — a footwear artifact from the past, reactivated through contemporary technology and speculative styling.



7.3 002_MUKLUKSUPERSTAR

For the 002_MuklukSuperstar lookbook, the visual direction was developed around the idea of extreme weather protection, translating the functional logic of Inuit footwear and clothing into a contemporary fashion image. Since this shoe was designed for Arctic conditions, I wanted the styling to communicate insulation, wind resistance, and a strong sense of environmental protection. Rather than treating the look as simple outerwear, I approached it as an extension of the shoe's performance logic.

The silhouette was informed by traditional Inuit garments and visual motifs, with an emphasis on volume, protection, and heaviness. Key elements included oversized shoulder protection, a face-covering hood inspired by ski masks, and narrow eye openings referencing traditional Inuit snow goggles. Together, these features helped create a look that feels both culturally grounded and futuristic. The styling reinforces the shoe's core themes of warmth, wrapped construction, and adaptation to severe climates.



1ST ROUND



LAST ROUND

In terms of material and color, I chose an all-black leather look to unify the outfit with the monochrome footwear and to give the overall image a more contemporary and editorial tone. Traditional Inuit graphic references were reinterpreted as padded panel details across the garment. During the AIGC process, I tested different pattern directions and construction ideas — including fringe-like details, horizontal banding, and circular padded forms — before refining the final composition. I also added three stripes on the back to strengthen the connection to adidas DNA.

Through this workflow, the lookbook positions 002_MuklukSuperstar within a speculative Arctic fashion context, where traditional cold-weather archetypes are transformed into a modern, performance-driven, and brand-specific visual language.



7.4 003_MDVL

For the 003_MDVL lookbook, I developed two different styling directions to reflect the dual nature of the shoe itself: a fusion of medieval pointed footwear and modern dress shoe language. Since the design is rooted in both historical formality and contemporary elegance, I wanted the visual narrative to move between pure historical reference and a more hybrid, fashion-oriented interpretation.

The first lookbook was based entirely on the image of a black metallic knight. This version took direct inspiration from medieval armor and emphasized the shoe's historical source as clearly as possible. The goal was to create a severe, sculptural, and almost ceremonial image that matched the exaggerated pointed silhouette of the shoe. In this look, the footwear is presented as part of a complete medieval-inspired figure, reinforcing the origin of the design in aristocratic and armored dress culture.



The second lookbook introduced more contrast. It began with the language of silver knight armor, but instead of showing armor alone, I placed it beneath contemporary clothing. The upper garment was designed as an oversized leather hooded jacket, while the lower half used faded black flared distressed jeans. This combination allowed me to bring in a more street-oriented attitude. Because the shoe contains both historical seriousness and the formality of modern dress shoes, I wanted to challenge the idea that this type of footwear only belongs to red carpets or elite settings. By adding streetwear elements, the lookbook creates a stronger tension between elegance, armor, and everyday fashion. To maintain the connection to adidas, I added three stripes to the shin armor as a subtle but clear brand element.

Through these two AIGC looks, 003_MDVL was positioned between heritage, formality, and contemporary street culture, allowing the shoe to operate not only as a historical reinterpretation, but also as a speculative fashion object with broader cultural relevance.



7.5 004_GETA

For the 004_GETA lookbook, I grounded the styling direction in Japanese culture, since the shoe itself is based on the structural language of geta. As a result, the most natural garment choice was a kimono-inspired look. I designed the outfit as a long robe silhouette, following the traditional construction logic of kimono cutting, while translating it into the same black leather material used throughout the other lookbooks.

This material choice helped unify the overall visual language of the campaign, allowing the look to remain culturally referential while still feeling contemporary, minimal, and aligned with the thesis's darker speculative tone.



To connect the garment back to adidas DNA, I reinterpreted the traditional waist fastening detail. Instead of using a single obi-like cord, I replaced it with three parallel ropes, creating a subtle transformation of the three-stripes element within a Japanese dress system.

For the model, I intentionally selected a European-looking face as a reference to the other side of this design's historical dialogue: the legacy of the high heel in Europe. This decision created a visual collision between two different cultural trajectories of elevated footwear, both of which informed the final shoe design. To reinforce a more futuristic sensibility, I chose a short slicked-back wet hairstyle, which sharpened the silhouette and prevented the styling from becoming overly historical or costume-like. As an accessory, I added a traditional paper umbrella, which introduced an additional sense of Japanese elegance, ritual, and cultural depth.

Through this AIGC lookbook, 004_GETA was framed as a meeting point between Japanese wooden sandal traditions and Western heel culture, using fashion styling to express the same cultural and formal collision embedded in the shoe itself.



Summary of Five Lookbooks

Together, the five lookbooks extend the footwear collection from physical prototypes into complete visual worlds. Each lookbook was developed to support the shoe rather than compete with it, using AIGC to imagine the body, garment, accessory, and atmosphere around each design.

The styling direction for each shoe responds to its own historical archetype and modern translation: 000_Barefoot focuses on body, origin, and a primitive-futuristic second-skin language; 001_Areni-510 uses archaeological protective wear to connect the ancient cave artifact with modern research; 002_MuklukSuperstar builds a heavy Arctic protection system around Inuit cold-weather clothing; 003_MDVL combines medieval armor with contemporary streetwear to challenge the formality of dress shoes; and 004_GETA merges kimono structure with high-heel references to visualize the collision between Japanese geta and Western elevated footwear.

Through this process, AIGC became a tool for campaign development, allowing each shoe to be placed into a speculative fashion context. The lookbooks helped transform the collection from isolated footwear objects into a broader narrative system of history, body, culture, and future design.





8. AIGC Film Workflow

8.1 000_BAREFOOT

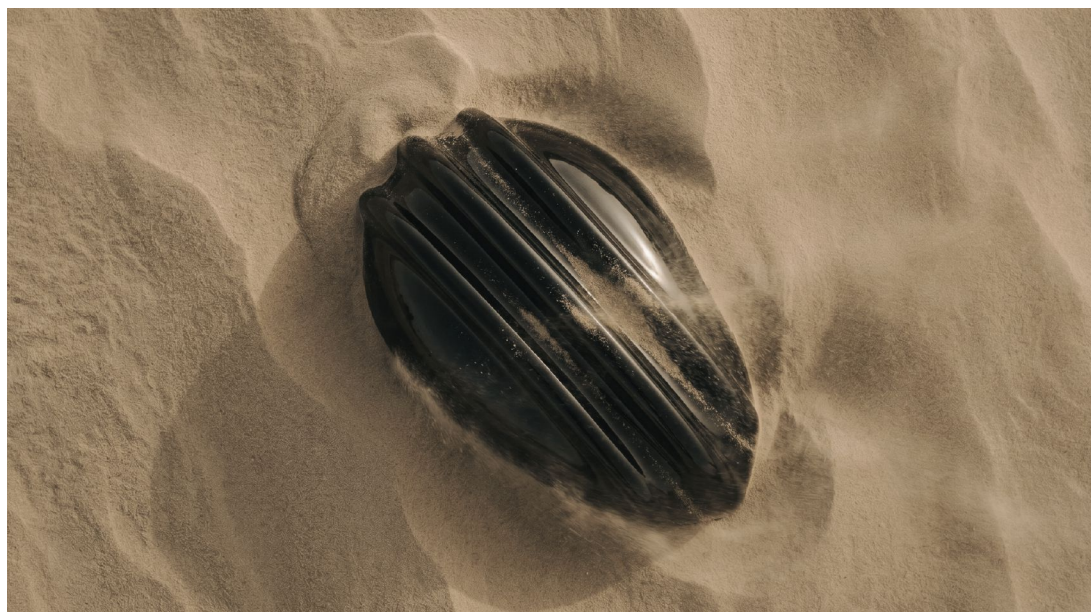
The campaign film for 000_Barefoot was developed as a one-minute moving image that extends the shoe's core idea into an atmospheric narrative world. While the footwear design itself reinterprets barefoot movement through a contemporary adidas language, the film translates this concept into a visual story about origin, solitude, and transformation. The setting is a desert under sandstorm conditions, where warm monochromatic tones, blowing dust, and a sparse landscape create a sense of primitive vastness. At the same time, the futuristic styling of the model, the sculptural mask, and the controlled cinematic framing introduce a speculative quality. The overall intention was to create a visual conflict between the primitive and the futuristic, allowing the film to reflect the thesis's broader interest in blending historical or archetypal references with contemporary and future-oriented design languages.

Before generating the video, I first locked the key visual identity of the character, including the model's face, hairstyle, outfit, mask, and shoes. This step was important because visual consistency is one of the main challenges in AI-generated moving image work. Once the character system was defined, I began constructing the film through a sequence of short AI-generated clips rather than generating one continuous video. Each shot was created as an independent 4–8 second segment, which allowed me to control composition, camera distance, and movement more precisely.

The narrative structure of the film unfolds in several stages. It begins with a close-up of the mask lying in the sand, partially buried and gradually revealed as wind blows the dust away. This opening functions as both a visual hook and a symbolic introduction to the film's theme of excavation and awakening. The model then appears in the desert and walks toward the mask. After discovering it, she puts it on, and the film shifts into a more performative runway-like sequence in which she walks through the sandstorm landscape. The camera alternates between wide shots, medium shots, and more intimate framings in order to emphasize both the vast environment and the bodily relationship between the model, the shoe, and the ground. In the final section, the model climbs a dune, removes the mask, and looks into the distance, where three African architectural forms appear on the horizon. The last shot shows her walking toward these structures, leaving the ending open and slightly mythical.

The full workflow combined AI still-image development, AI video generation, and AI music generation. After producing multiple clip variations from different angles and distances, I edited them together to create a coherent rhythm and emotional progression. I also generated the background music with AI so that the pacing of the sound could be aligned with the visual arc of the film, allowing moments of tension, climax, and calm to be timed deliberately against the sequence of images.

As the first campaign film in the series, this video involved significant trial and error. The main challenges included maintaining consistency in the model's appearance and outfit, controlling the speed and believability of walking motion, and finding camera movements that felt cinematic rather than arbitrary. Although imperfect, this first film established a practical workflow and a set of creative lessons that directly informed the production of the following four campaign videos.



7.2 001_ARENI 510

The campaign film for 001_Areni-510 was structured in two main parts, moving from archaeological discovery to scientific observation and presentation. This narrative directly reflects the concept of the shoe itself: a reinterpretation of the ancient Areni-1 shoe through the lens of a modern climbing shoe. Rather than representing an imagined prehistoric wearer, I chose to build the visual story around an archaeologist, using excavation and laboratory research as the main cinematic framework. This approach made the contrast between the ancient artifact and the contemporary redesign more direct and understandable.

In the first part, the model appears inside a cave, using archaeological tools to dig through soil and rock. The shoe is discovered as if it were an unearthed artifact and is then carefully sealed in a transparent preservation bag. Visually, this section emphasizes darkness, dust, and tension. The shots include first-person flashlight views moving through a low-light cave environment, as well as static documentary-like camera angles that resemble field-recording footage. These perspectives help create a sense of realism and mystery, as if the viewer is witnessing an actual excavation process.

In the second part, the narrative shifts to a laboratory setting. The model brings the shoe back for analysis and observation, and the environment becomes cleaner, brighter, and more clinical. Here the camera language changes as well: instead of the unstable and tactile feeling of the cave, the laboratory scenes use more tracking shots that follow the model's gestures and movement around the shoe, combined with overhead surveillance-style views that suggest monitoring, categorization, and scientific inspection. The final sequence transforms the laboratory corridor into a runway, where the model wears the shoe and presents it through a controlled walk. This transition from object to wearable prototype reinforces the transformation from archaeological reference to contemporary design.

The sound direction also supported this shift in atmosphere. The music maintained a techno-based texture, but moved from a mysterious and tense mood in the cave scenes toward a more mechanical, scientific, and experimental tone in the laboratory scenes. Compared with the first campaign film, this video used a clearer two-part structure and a more straightforward narrative, allowing the design concept to be communicated more efficiently while continuing to refine the AI-generated film workflow.





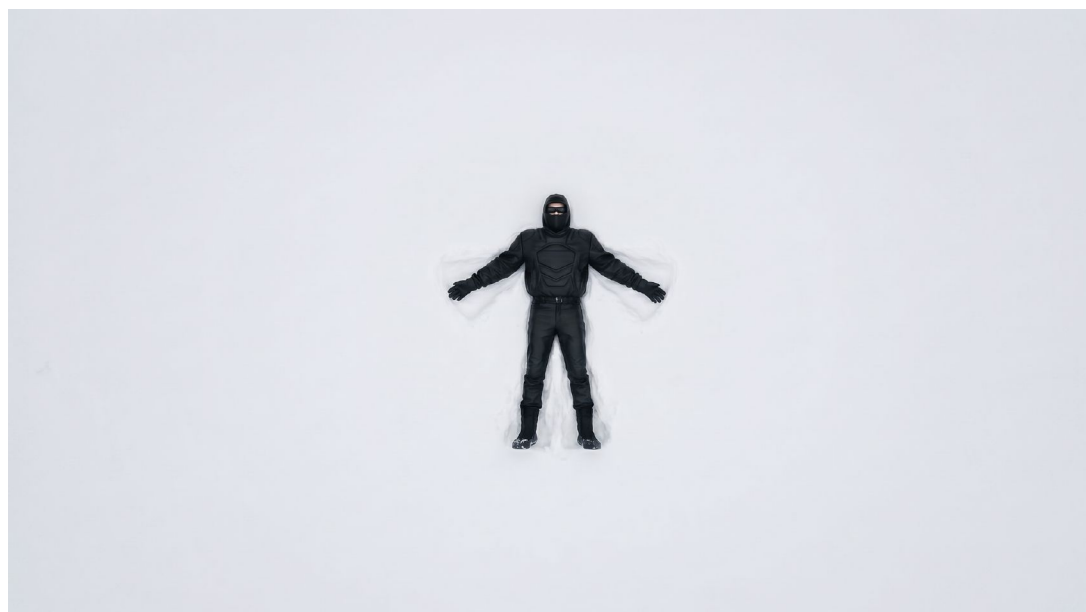
7.3 002_MUKLUKSUPERSTAR

The campaign video for 002_Mukluksuperstar was structured around two connected environments in order to emphasize the shoe's relationship to extreme cold-weather conditions. The first scene takes place on an arctic glacier. The model stands alone at the center of the frozen landscape while the camera rotates 360 degrees around the body, establishing both the silhouette of the outfit and the isolation of the environment. From this still beginning, the model starts running across the ice, and the camera shifts into faster tracking shots. I also used a drone-like aerial angle that rapidly moves toward the model, creating a dynamic transition that bridges the glacier sequence to the second scene.

The second scene moves from the darker, icy landscape into a nearly all-white snowstorm setting in the mountains. Here, the visual focus becomes more atmospheric and physical, with blowing snow, reduced visibility, and a stronger sense of harsh weather. The video ends with the model lying in the snow while the camera looks downward from above and gradually rises higher, creating a quiet and almost suspended final image.

As with the other campaign videos, I first fixed the model, styling, and footwear design, then generated multiple short clips from different distances and angles before editing them together. The soundtrack was built on a techno foundation, combined with Inuit jaw harp elements and rougher textures to reinforce the blizzard atmosphere and the shoe's extreme-weather narrative.



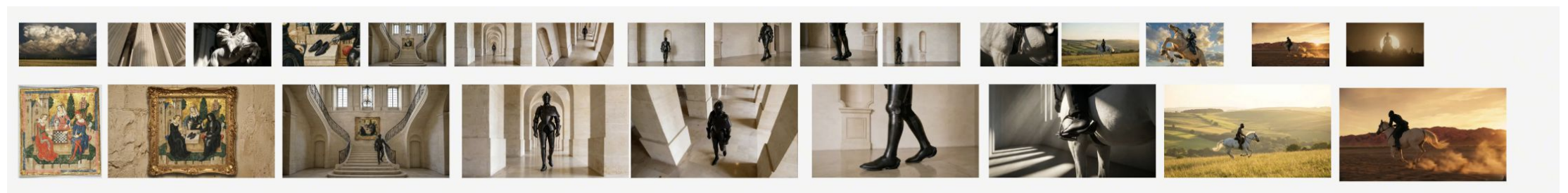


7.4 003_MDVL

The campaign film for 003_MDVL was structured in three narrative sections, using a more poetic and elegant visual language to support the shoe's connection to medieval fashion history and contemporary dress footwear. Unlike the other campaign films, this was the only video in which I did not generate the soundtrack with AI. Instead, I used the piano version of "Runaway" from Westworld, originally based on Ye's song. The slow and emotional piano rhythm helped create a sense of ceremony, nostalgia, and dramatic elegance, which matched the refined and historical tone of this shoe.

The first section introduces the medieval French atmosphere through a series of establishing shots. These include a castle environment, sculptural images of a knight on horseback, and outdoor fields that suggest the historical landscape surrounding the design reference. The model then appears inside a medieval-style painting, placing the shoe and character directly into the visual language of historical art. This opening was designed to feel like entering an archive or memory, where the figure first exists as an image before becoming physically present. The transition from the first section to the second section happens through a continuous zoom-out movement. The camera pulls back to reveal that the painting is hanging on the wall of a medieval castle. From there, the model, dressed in black knight armor, walks down the staircase and enters the architectural space of the castle. This moment transforms the figure from a painted reference into a moving body. The second section functions more like a runway sequence, where the model walks through large marble corridors. The environment is intentionally grand, symmetrical, and Renaissance-like, creating a strong sense of scale and historical elegance. The architectural background supports the shoe's formal quality while also emphasizing the sharpness and drama of the silhouette.

The third section moves the narrative outside the castle. The model walks toward a horse, and the camera shifts into a close-up of the shoe stepping into the stirrup. This moment was important because it connects the footwear directly to the idea of the knight as a moving figure, not only as armor or decoration. The final sequence shows the knight riding across a French field at sunset, moving toward the horizon. The warm light and open landscape create a more cinematic ending, softening the severity of the armor and giving the film a romantic, almost mythic quality. Overall, the film uses medieval architecture, painting, armor, horseback movement, and piano music to frame 003_MDVL as the most elegant and poetic video in the campaign. Rather than emphasizing speed or technical function, this film focuses on atmosphere, historical memory, and formal beauty, allowing the shoe's pointed medieval reference and modern dress-shoe identity to exist within a more emotional visual world.



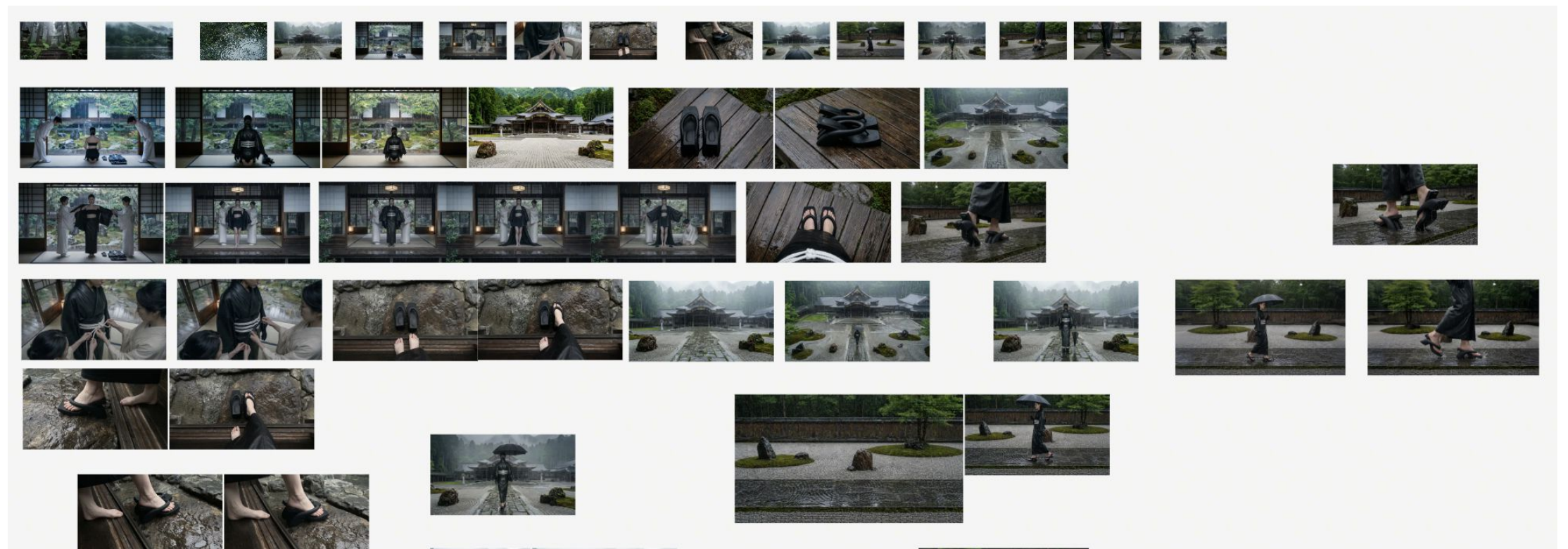


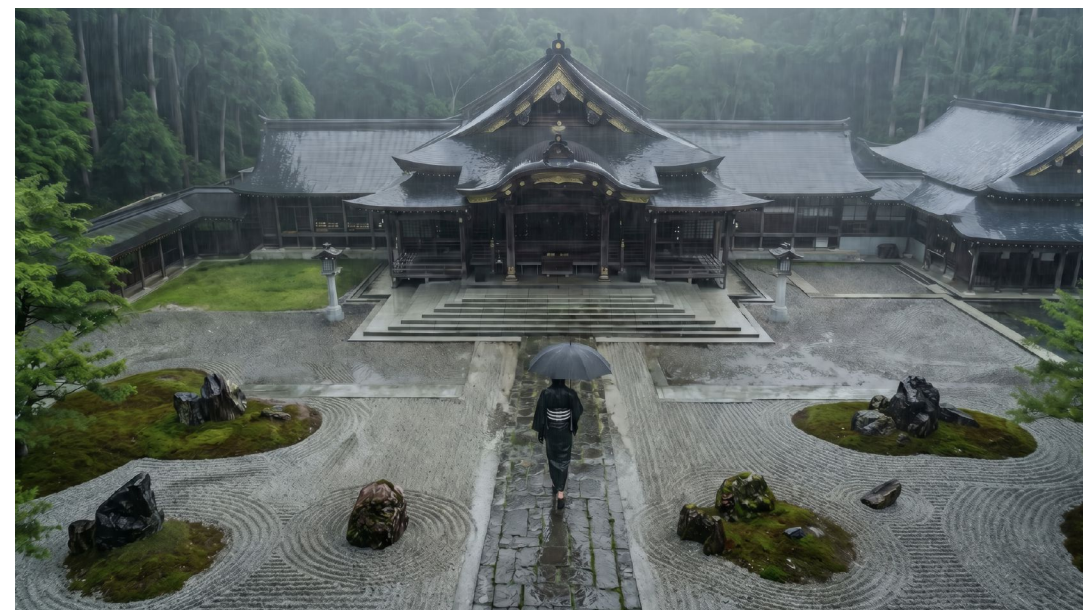
7.5 004_GETA

The campaign film for 004_GETA is set in Japan during the summer rainy season. The film begins with traditional temple and torii gate imagery, establishing a quiet and ritualistic atmosphere. The first scene shows the model seated from behind in a zen garden courtyard, while two attendants stand symmetrically beside her and help dress her in a black leather kimono.

After this preparation sequence, the camera shifts to a first-person view as the model puts on the 004_GETA shoes. This moment connects the viewer directly to the act of wearing the design. The second scene becomes a slow runway sequence through the garden, where wet stone paths, moss, rain, and minimal Japanese architecture frame the shoe's elegant silhouette. The model's European facial features and modern slicked-back hairstyle create a contrast with the Japanese setting, reinforcing the design concept of merging geta structure with Western high-heel language. The film ends with the model holding an umbrella and walking toward the temple from behind.

The music uses a techno foundation to maintain a futuristic tone, while bamboo flute and guzheng-like textures add a subtle East–West hybrid feeling. Overall, the film presents 004_GETA as a ritualized and elegant collision between Japanese tradition, European femininity, and contemporary fashion.





Overall Reflection

The AIGC campaign films became an important extension of the footwear collection. After the physical prototypes were completed, the films allowed each shoe to move beyond an isolated object and enter a more complete visual world involving body, clothing, environment, movement, and sound.

Across the five films, I used AI not as a replacement for design, but as a tool for visualizing the atmosphere behind each footwear concept. Each video was developed to support the logic of the shoe: the desert landscape for 000_Barefoot, the cave and laboratory for 001_Areni-510, the glacier and blizzard for 002_MuklukSuperstar, the castle and horseback sequence for 003_MD-VL, and the rainy Japanese garden for 004_GETA. These settings helped communicate the historical and cultural references behind the designs in a more immediate and emotional way. The process also revealed the limitations of AI-generated video. Maintaining consistency in character identity, clothing details, shoe form, walking motion, and camera movement required many iterations. Because of this, I generated the films as multiple short clips instead of single continuous videos, then edited them together manually. This allowed me to control pacing, narrative, and visual rhythm more carefully.

Sound became another important layer of the workflow. For most films, AI-generated music allowed me to match the emotional structure of the video, from tension and climax to slower atmospheric moments. Together, image, motion, and sound helped transform the thesis from a footwear prototype collection into a speculative campaign system. Through this process, I learned that AIGC can be a powerful tool for fashion and footwear storytelling when it is guided by a clear design concept. The final films do not replace the physical shoes; instead, they expand the meaning of the prototypes and show how each design might exist in a larger cultural and cinematic world.

VIDEOS LINK: <https://drive.google.com/file/d/19O8DL4BXz6hWNkmRUDVMGW-0-jwnMjTi/view?usp=sharing>

CONCLUSION

This thesis began with the question of how historical footwear can become more than a visual reference for contemporary design. Through research, interviews, prototyping, and campaign development, STEP OF TIME argues that historical footwear should be understood as a system of form, construction, material logic, cultural meaning, and bodily experience.

In response to the first research question, this thesis shows that historical footwear archetypes influence contemporary design not only through silhouette, but also through the deeper logic behind each form. Barefoot movement, the Areni-1 shoe, Inuit mukluks, medieval pointed shoes, and Japanese geta each represent a different relationship between the body, environment, material, movement, and social identity. Their value is not in being copied visually, but in revealing how footwear has historically responded to human needs and cultural conditions.

For the second research question, the five prototypes demonstrate how historical forms and construction logics can be translated through digital design and 3D printing. The Weighted Design System allowed each shoe to balance historical silhouette, historical execution, modern footwear language, and contemporary fabrication differently. Through Gravity Sketch, Rhino, Grasshopper, and FDM TPU printing, historical references were transformed into physical footwear prototypes. In this process, 3D printing became not only a production method, but also a design language shaped by material behavior, texture, flexibility, density, and wearability.

The third research question focused on brand DNA. Across the collection, adidas Originals language was integrated not as surface branding, but as structure, rhythm, and construction. The Three Stripes became raised forms, padded details, outsole systems, and strap logic, while references such as Superstar and Five Ten were used as modern footwear systems rather than fixed products to imitate. This allowed the collection to connect historical archetypes with a recognizable contemporary brand language.

The AIGC lookbooks and campaign films further extended the prototypes into broader visual worlds. By adding body, garment, environment, movement, and sound, the campaign development showed how footwear can carry a complete narrative beyond the object itself.

Ultimately, STEP OF TIME suggests that innovation in footwear does not always require abandoning the past. Instead, innovation can emerge from looking at history more carefully. Historical footwear contains accumulated solutions to human needs: how to walk, protect, elevate, decorate, symbolize, and belong. When these systems are translated through contemporary tools and cultural contexts, they can generate forms that feel both ancient and new.

This thesis therefore positions footwear as a bridge between memory and speculation. Each prototype is not a reconstruction of history, but a proposal for how history can continue to move. The past is not treated as something behind design, but as something inside it — a structure that can be studied, transformed, and carried forward.

History is not a reference — it is a system waiting to be redesigned.

Appendix: Text for Survey Questions

INTERVIEW QUESTION W/ FOUNDER

- 1. How long have you worked in the footwear industry?
- 2. In your experience, what elements or factors are the most important part that increase your business?
- 3. In business wise, which elements or aspect do you think could resonate more costumers?
- 4. Do you have any knowledge about cultures that had a significant influence on footwear fashion trends?
- 5. Did any cultures events influenced your branding seasonal deraction? If yes, how?
- 6. In your opinion, what lessons can modern footwear designers learn from historical archive?
- 7. In your experience, what is the most important source that influences your business design thinking?
- 8. Would you like to share one of your succesful project about your design thinking and business thoughts?

INTERVIEW QUESTION W/ DESIGN EXPERT AND FOUNDER

- 1. How long have you worked in the footwear industry?
- 2. What aspects do you usually toko inspirations from ?
- 3. In business wise, which elements or aspect do you think could resonate more costumers?
- 4. Do you have any knowledge about cultures that had a significant influence on footwear fashion trends?
- 5. Did these cultures change your personal design trends? If yes, how?
- 6. In your opinion, what lessons can modern footwear designers learn from historical archive?
- 7. In your experience, what is the most important source that influences your design thinking and design logic?
- 8. Would you like to share one of your succesful project about your design thinking and business thoughts?

INTERVIEW QUESTION W/ EXPERT

- 1. As a professional footwear materials developer, what do you think of sustainable materials?
- 2. Are there any new eco-friendly materials or technologies Adidas is exploring for future footwear lines?
- 3. How does Adidas work with suppliers to ensure the sustainability and ethical sourcing of materials?
- 4. How do you or your team assess the environmental impact of materials used in sneaker production from extraction to end-of-life?
- 5.How does your team balance the cost implications of using sustainable materials with the need to keep products affordable?
- 7. How do you see the positive impact of sustainable material use on ecosystems?
- 8. If possible, would you like to share one of your successful work which related to any recycled material?

INTERVIEW QUESTION W/ COSTUMER

- 1.Do you have any footwear preference? For example, the footwear types, brand, etc.
- 2. Do you do any recycle activities in your life?
- 3. When choosing sneakers, how do you prioritize sustainability compared to other factors like design, comfort, and price?
- 4.How much more are you willing to pay for a sneaker that is sustainably produced compared to a standard one?
- 5. Does brand sustainability initiatives influence your loyalty to a sneaker brand?
- 6.Do you consider the life cycle of a sneaker, such as the ability to recycle or compost it, when making a purchase?
- 7. What do you think of the higher pricing when the shoes using recycle materials?
- 8.If you remember, which shoe or which brand are designed a pair of shoe with recycle materials that you were impressed?

3D Printing Questions For All

- 1.As a footwear designer, what do you think of 3d print as the new technology of this industry? Have you ever used this technology for your project?
- 2.In your experiences, what do you think the 3d print could influence the impact of manufacturing on form development?
- 3.In your experiences, what do you think the 3d print could influence the impact of performance on form development?
- 4.Would you like to share your experience on footwear 3d print design? Material wise/design wise/technology wise

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