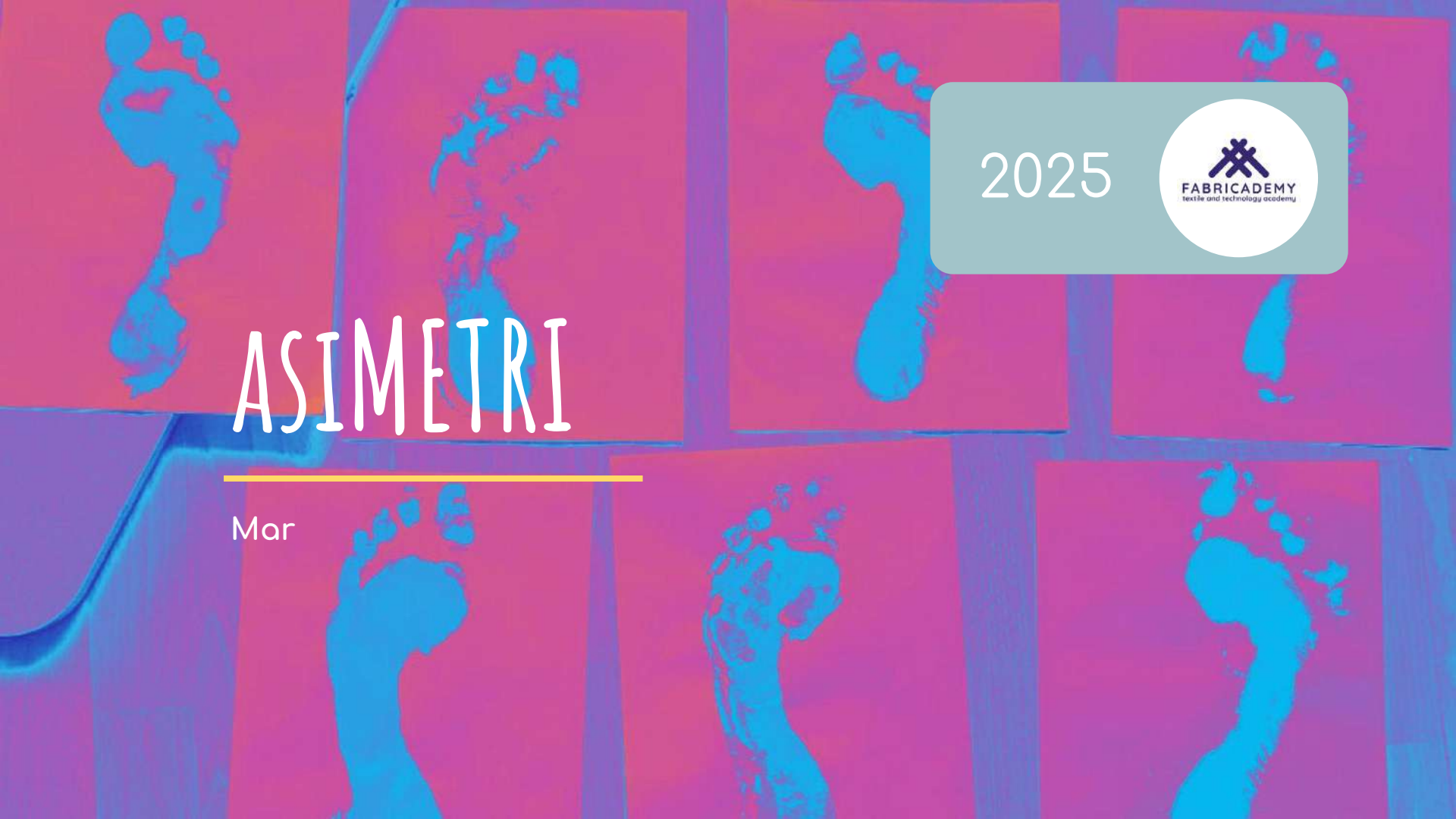


2025

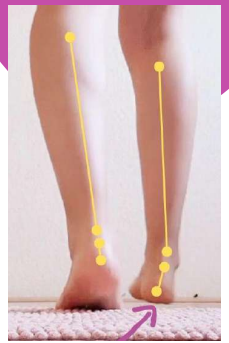
FABRICADEMY
textile and technology academy

ASIMETRI

Mar

STORYBOARD

WAKING



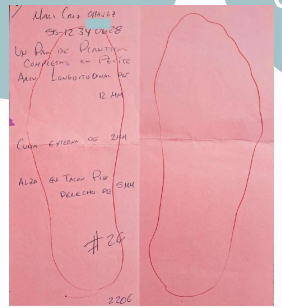
PROBLEM

LIFE WITH INSOLES

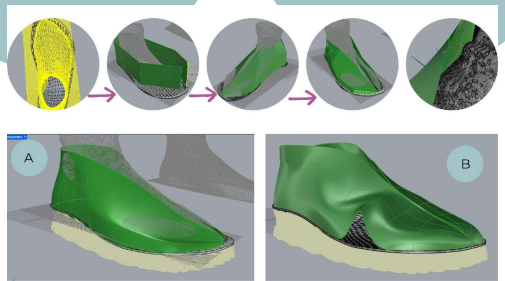
ANALYSIS

IDEATION

DIAGNOST

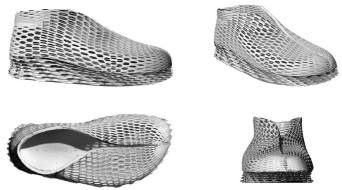


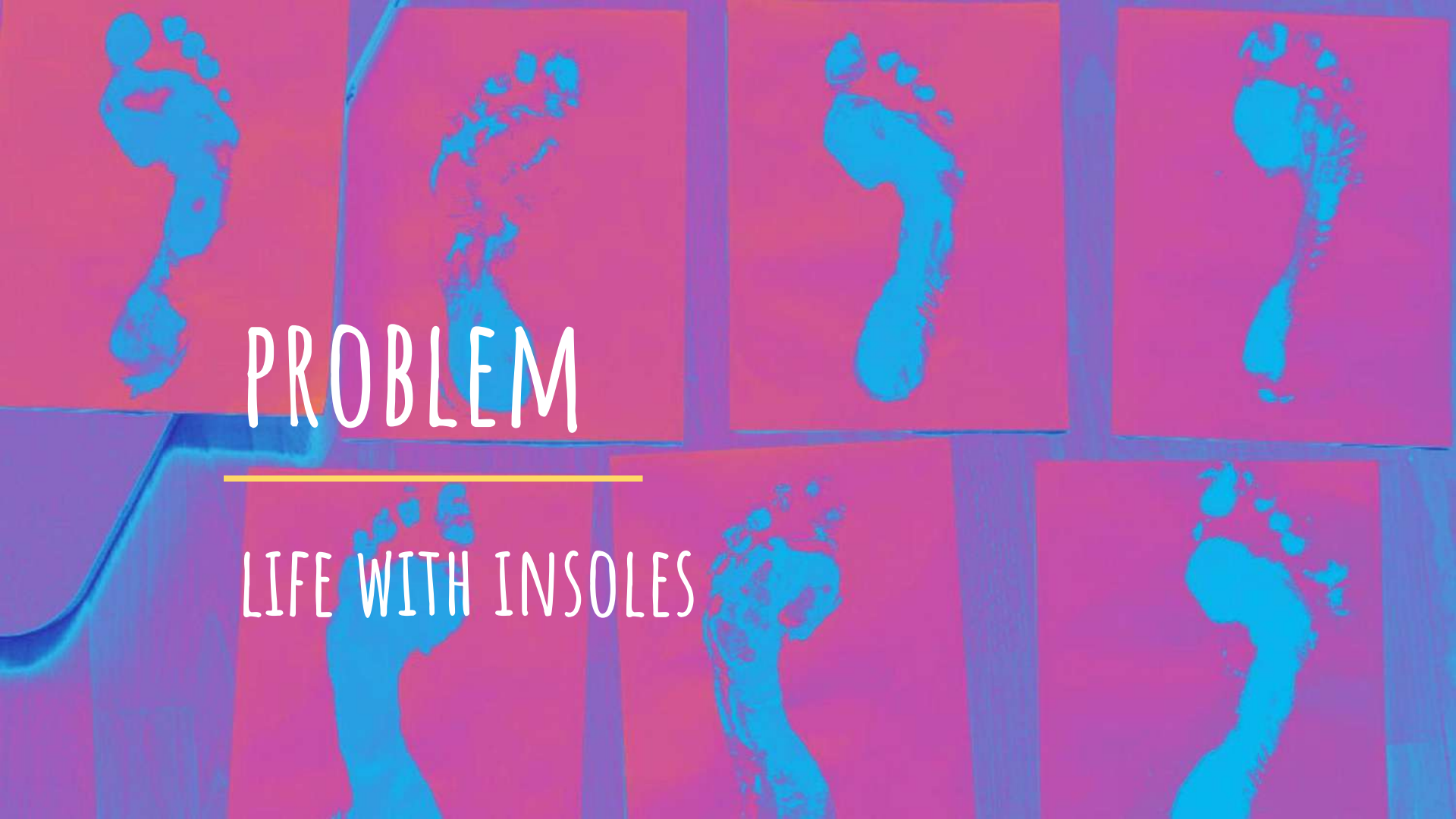
WORK IN COMPUTER



PROCESS

RESULTS





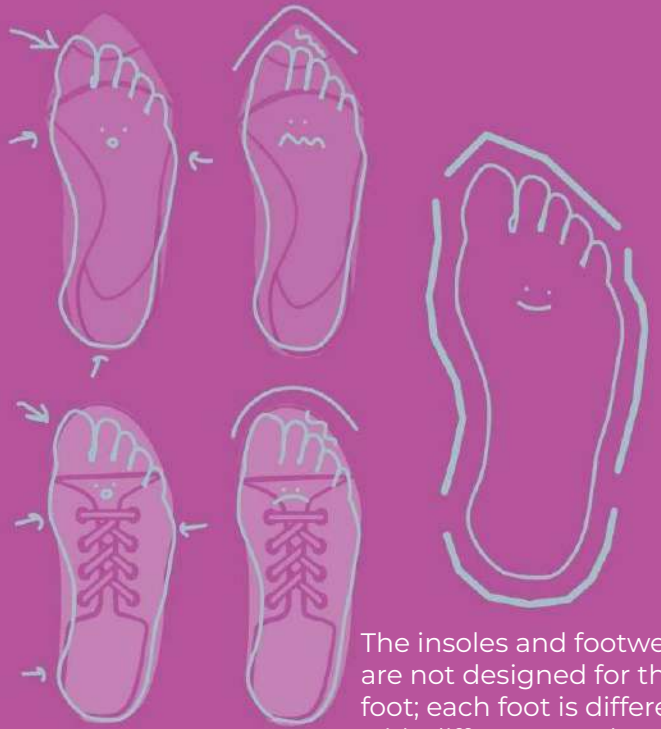
PROBLEM

LIFE WITH INSOLES

Why design shoes?

The sacrum and pelvis can tilt or rotate, leading to postural imbalance, joint wear, and lower back or sacroiliac pain.

I have a genetically shorter left leg by 1 cm.



The insoles and footwear are not designed for the foot; each foot is different with different needs.

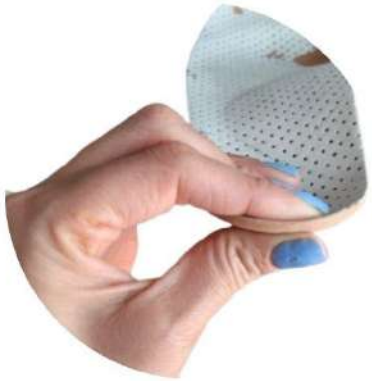
Who? Mec

Lower limb discrepancy.

It is a condition in which there is a difference in the length of the leg bones, which can affect posture, gait, and weight distribution in the body.

I need to wear insoles that compensate for this asymmetry.

Left foot strike



Orthopedic insoles

Right foot strike

Right foot

Heel strike:
When touching the ground, the highest pressure is on the heel.

+1 CM

Left foot

Toe-off:

The pressure is concentrated on the forefoot and toes.

Orthopedic brace for spinal correction due to bone asymmetry

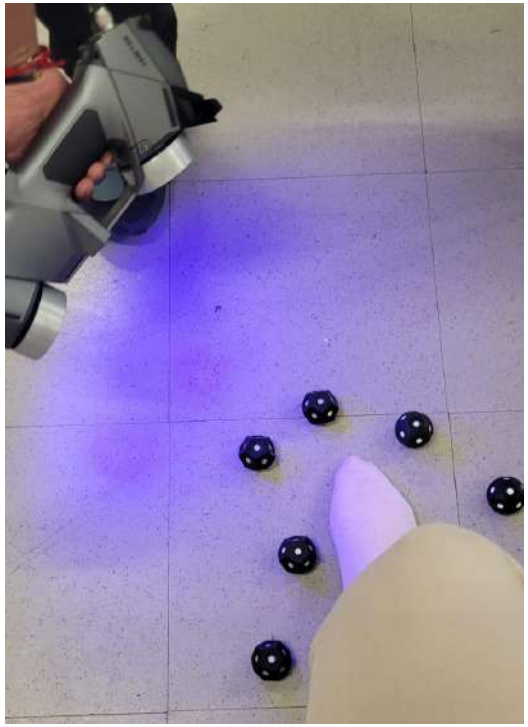
Midstance:

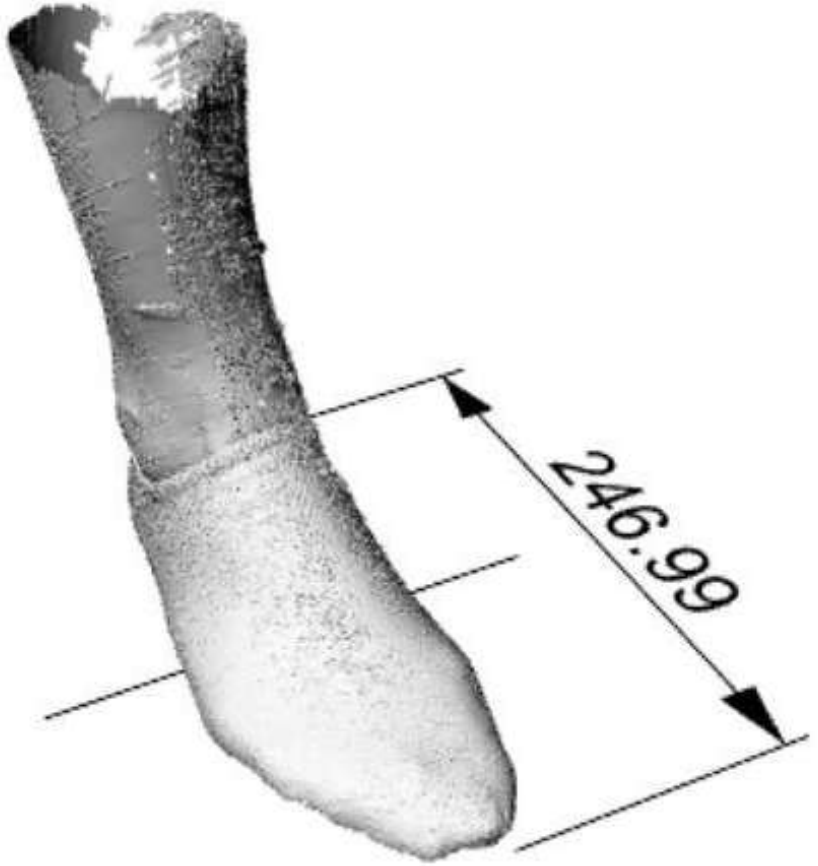
The weight is distributed across the arch and the metatarsal.

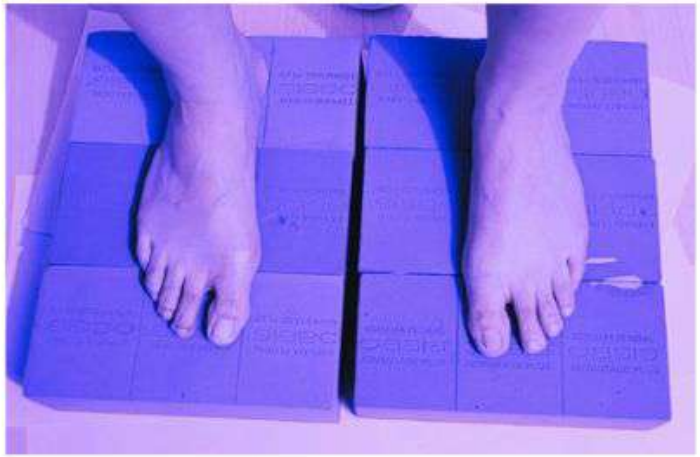
ANALYSIS

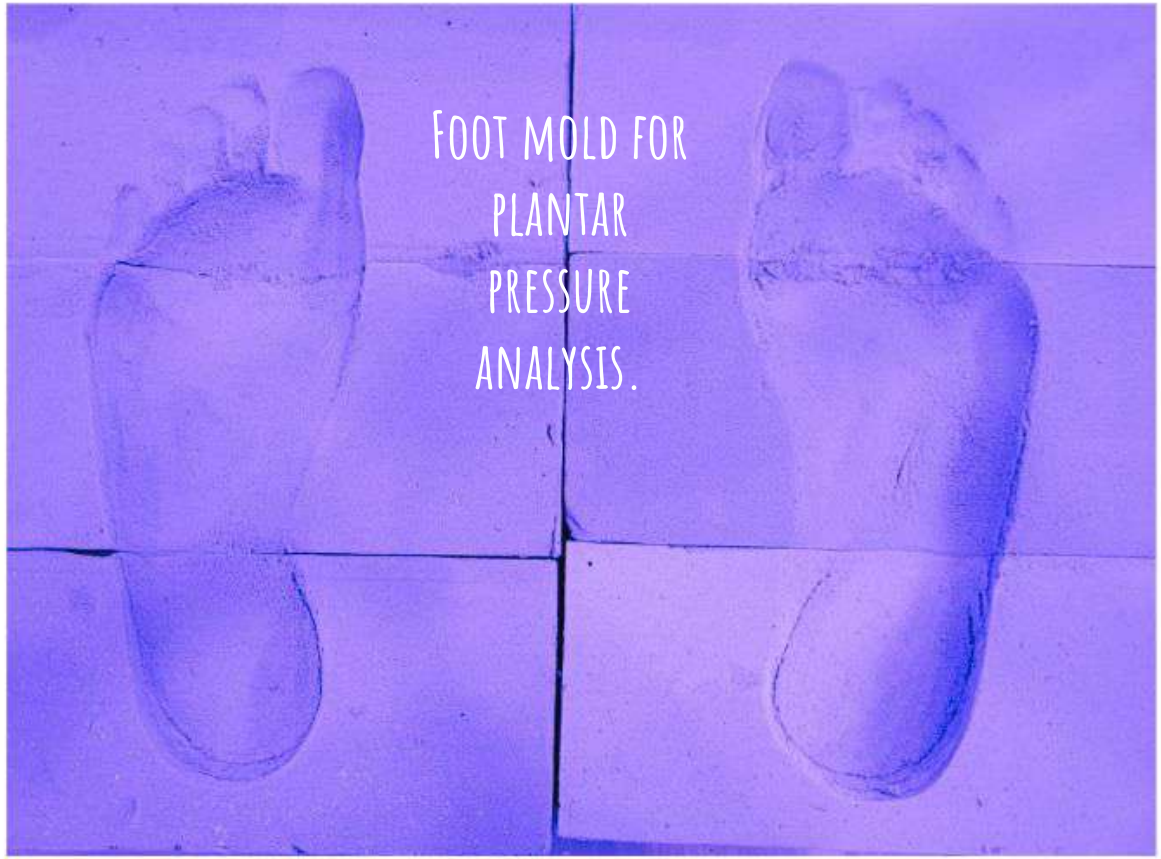
Scanning

I scanned my foot using the machine HandySCAN 3D|SILVER









Foot mold for plantar pressure analysis.


600gr

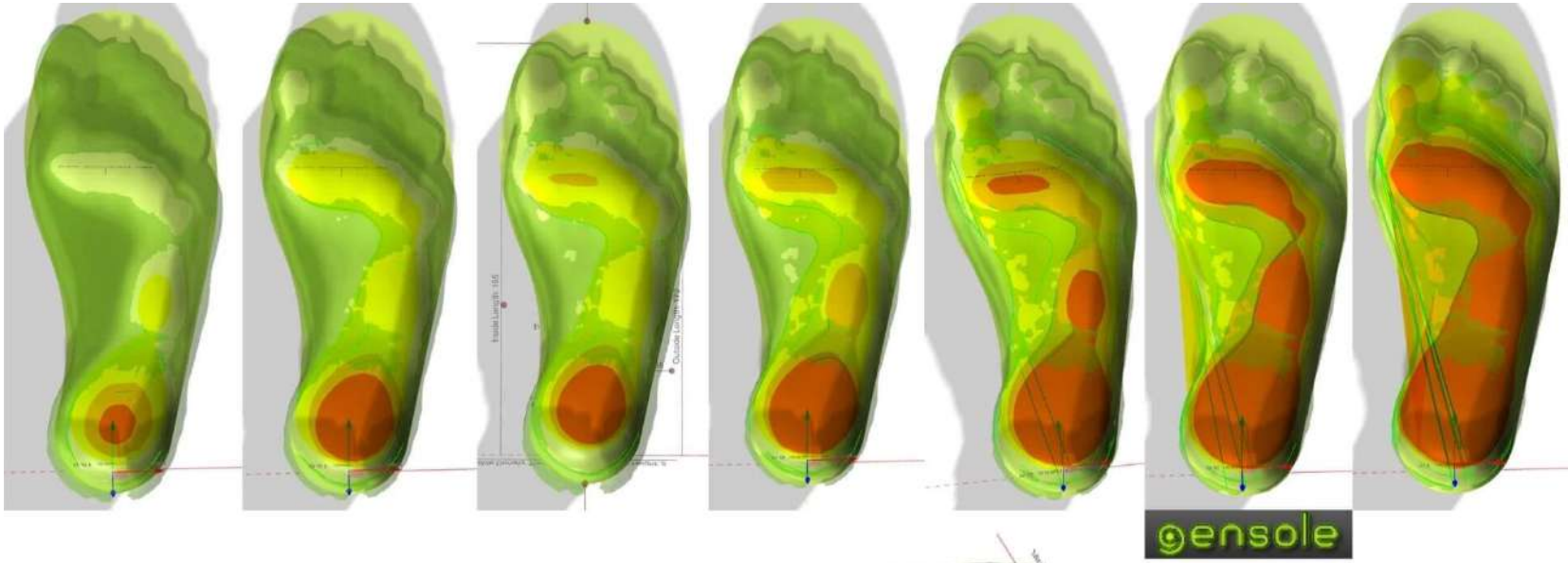
Scanning

I scanned my foot using the machine Creality scan

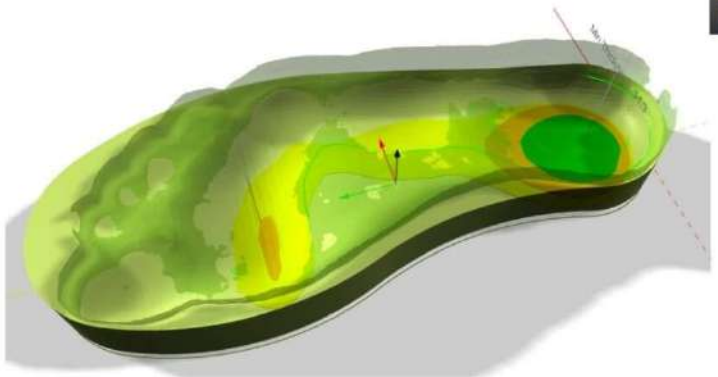

Scanner for
the
dimensions of
the foot.


Scanner for
flexion
analysis.


DIAGNOST



Right foot



Using the 3D design of my foot soles, captured while applying pressure with my own body.

This test allowed me to observe the difference in pressure between my left and right foot. While I had some initial assumptions, I decided that the best course of action was to consult the orthopedic specialist who had previously treated me.

gensole

Left foot

by MAR

Doctor's notes:
"His notes indicate a pair of full insoles in Pelíre: 12 mm longitudinal arch, 2 mm external wedge, and a 5 mm heel lift for the right foot, size 26."

This is the analysis I requested: Full-body densitometry, with a cost of 584.25 MXN.

Monto total	$ 584.25
Ahorro digital	$ 194.75
Forma de pago	Pagado en linea
Fecha del pedido	28-02-2021
Hora del pedido	10:06:50

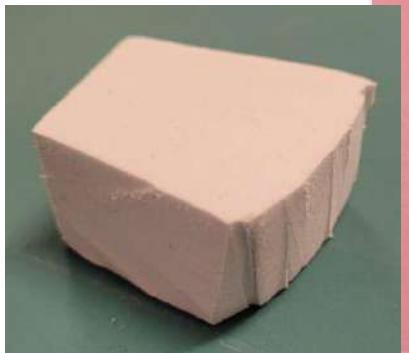
Descargar Cotización

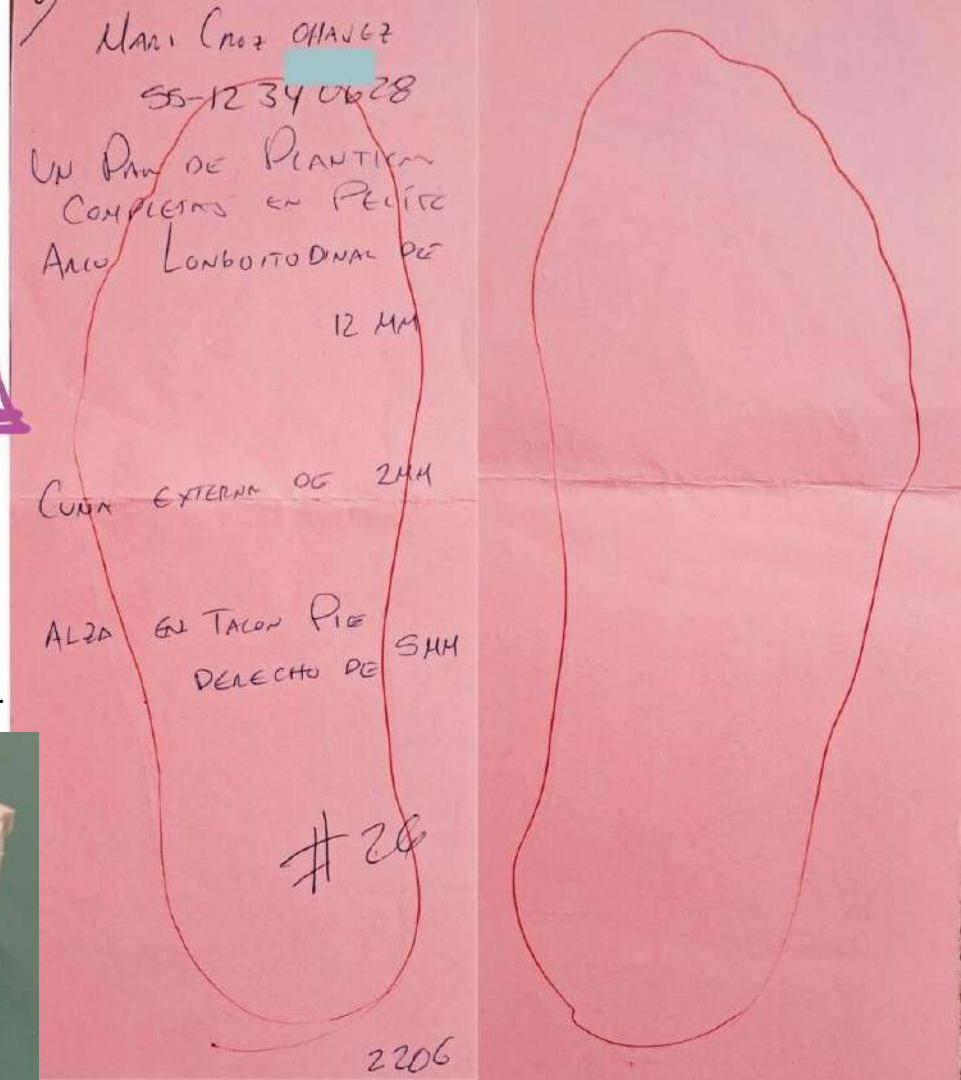
El resumen de tus estudios

DENSITOMETRIA DE CUERPO ENTERO

Precio $ 584.25

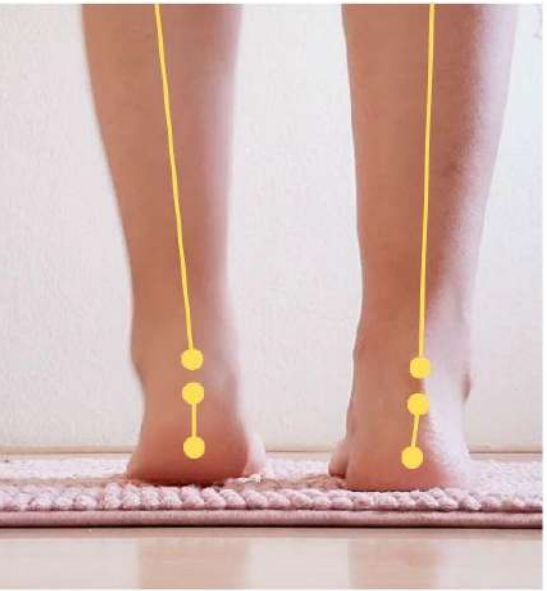
Sample of the foam used in the insoles, it is the desired density.

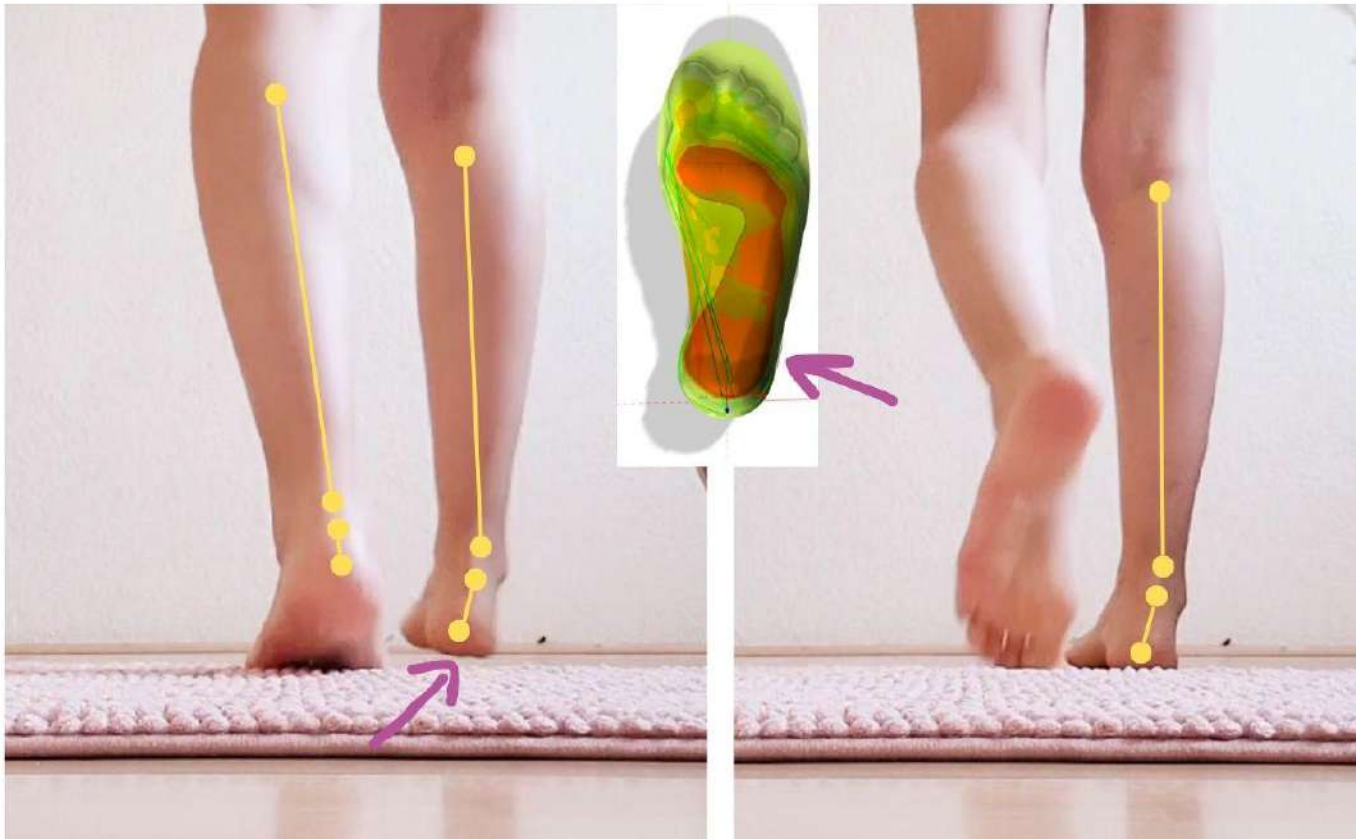


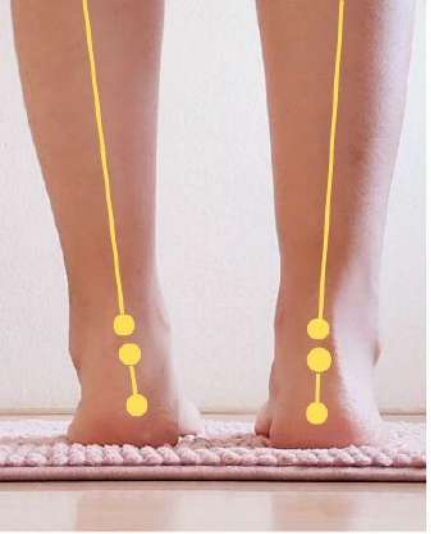


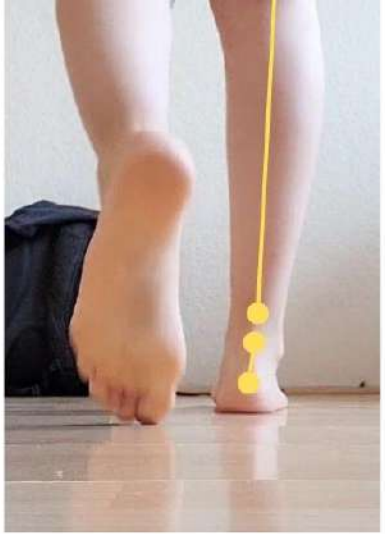
Over-supination

Over-supination (or excessive supination) in the gait occurs when the body's weight shifts too much to the outer edge of the foot while walking or running.

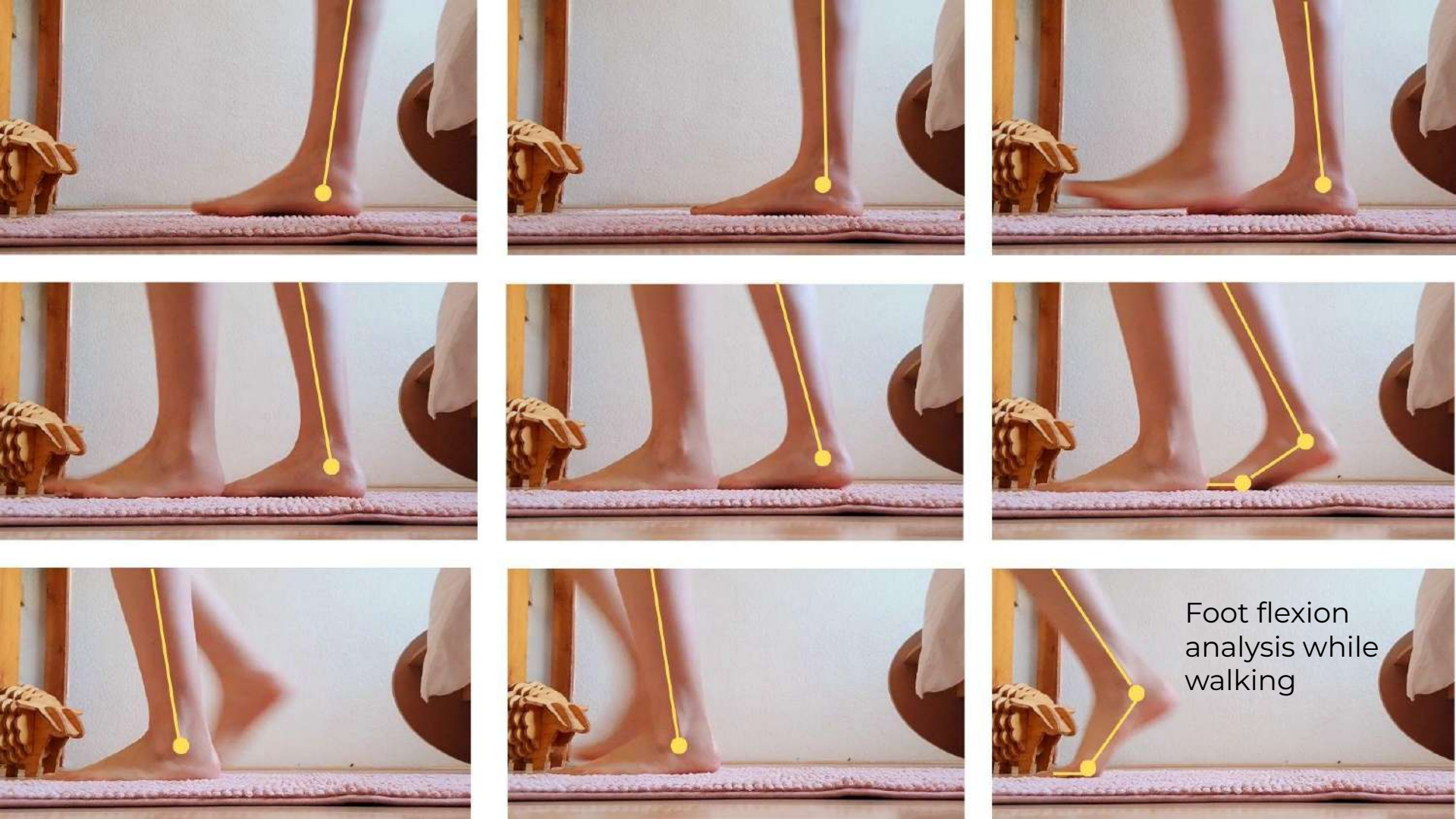




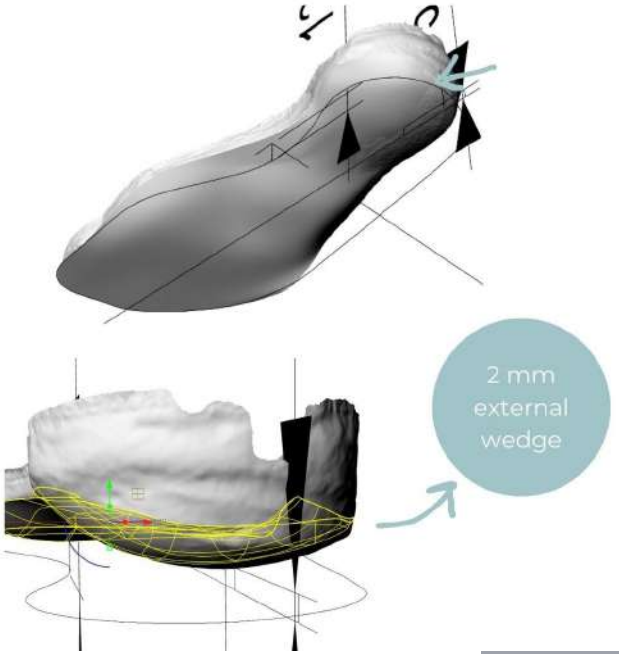


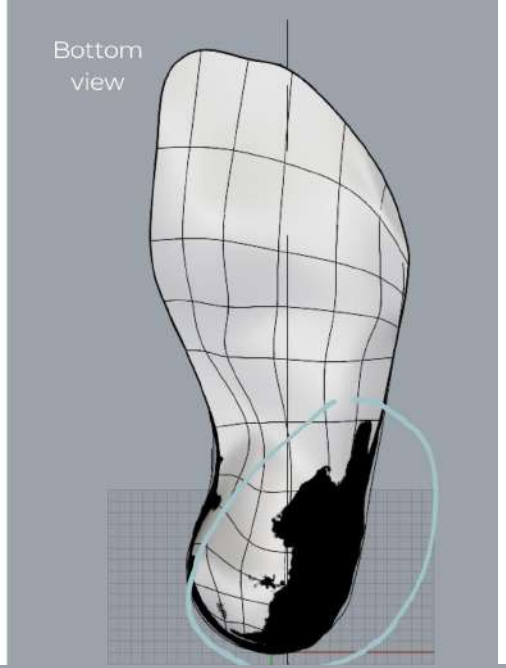





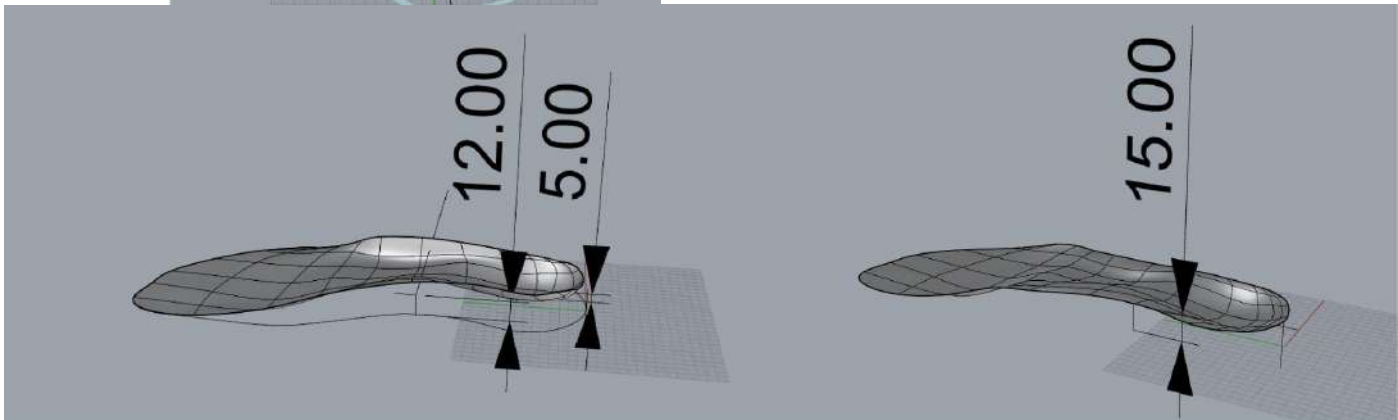


Foot flexion
analysis while
walking

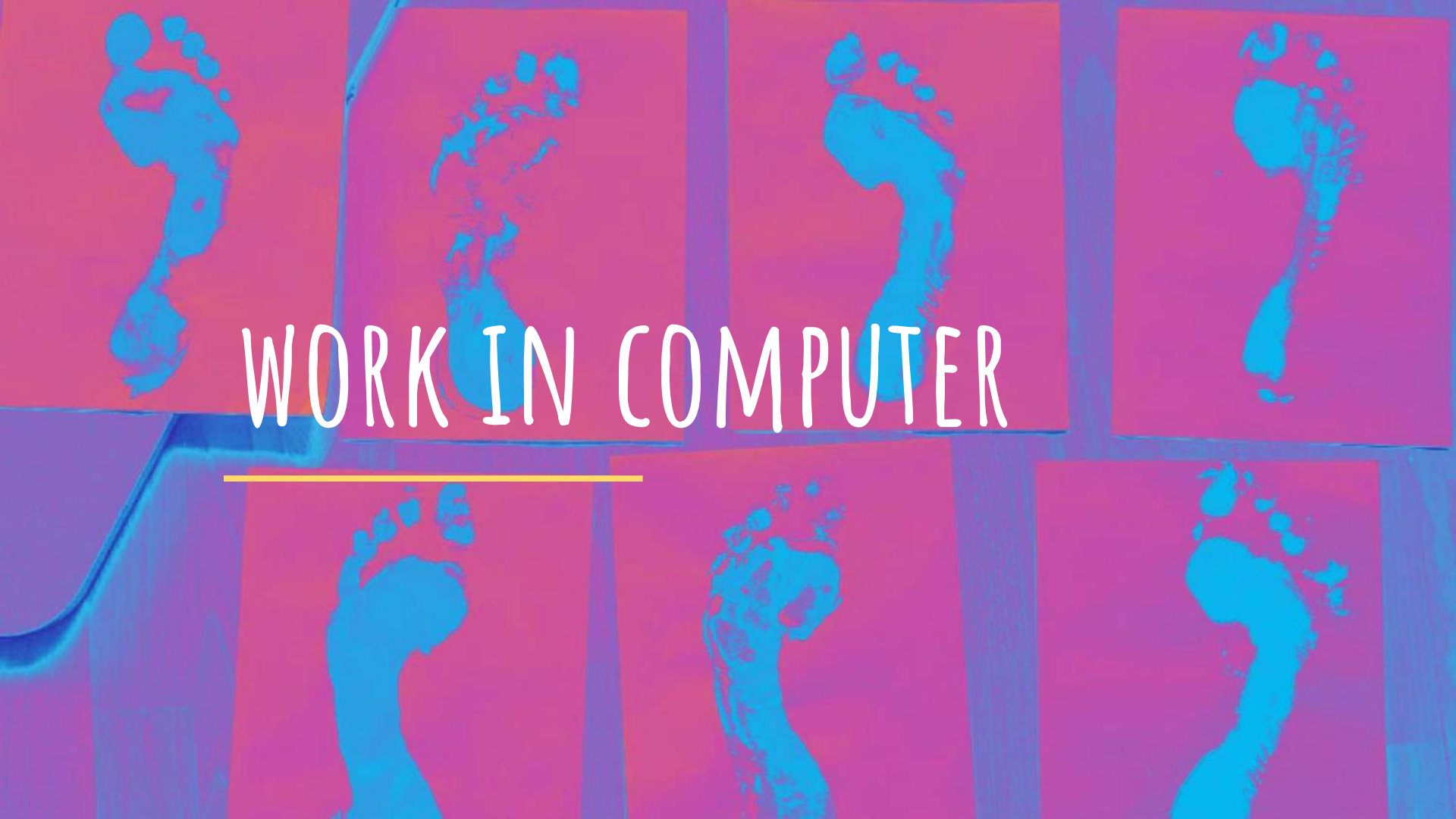
IDEATION



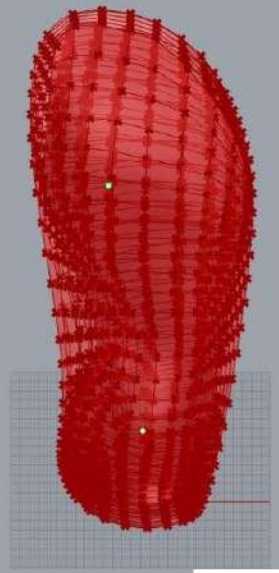


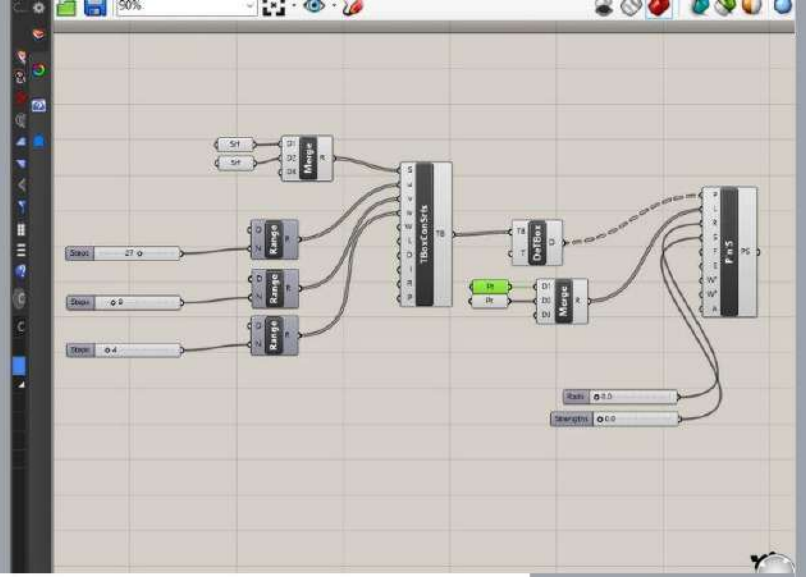
With the help and supervision of the orthopedic doctor, I began creating a 3D insole for printing. This shoe will be analyzed in the short, medium, and long term to prevent worsening the hip problem.

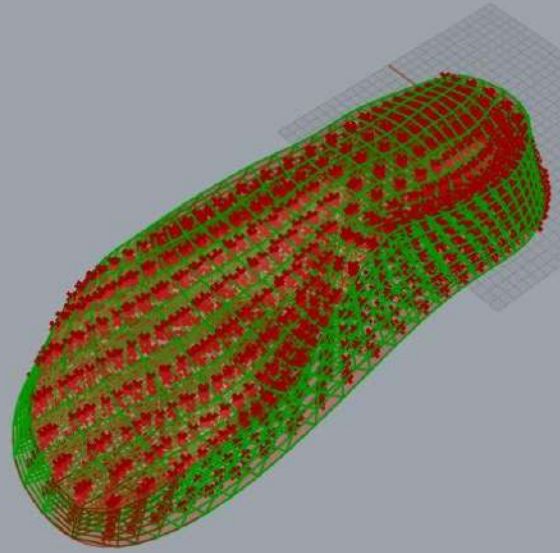



WORK IN COMPUTER

This is the 3D insole with openings for ventilation.

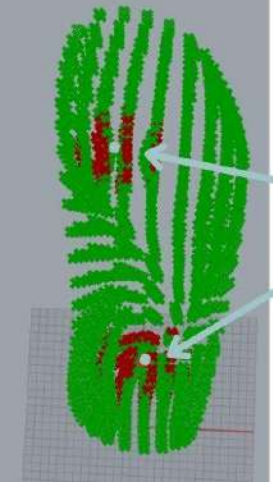


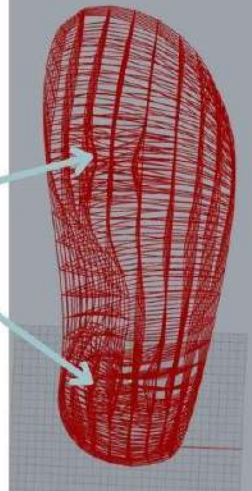


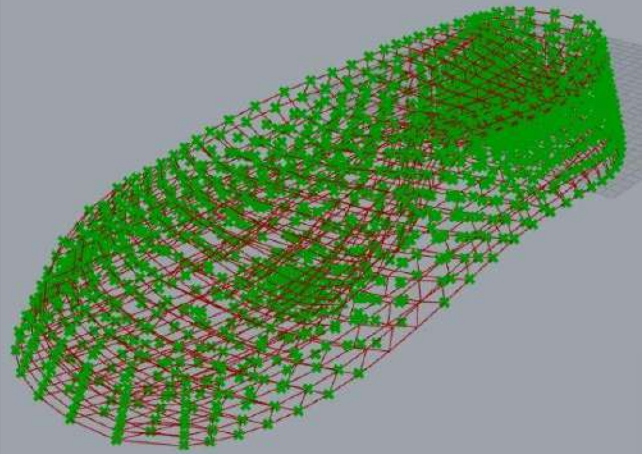


For the sole and insole filling, I placed a mesh with attraction points towards the areas where the body applies more weight while walking.

Plantar peak pressure points while walking.



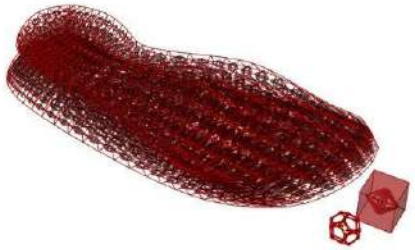


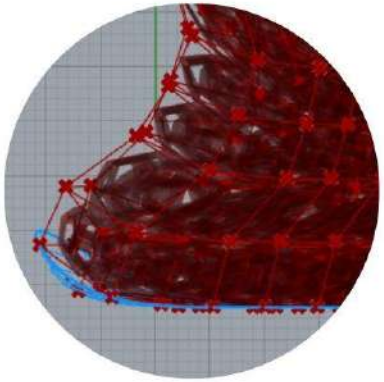


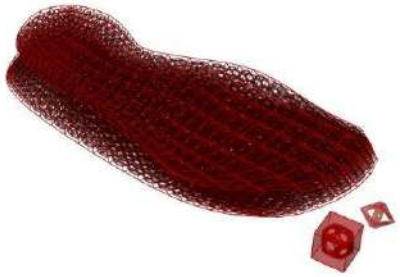
Twisted box consecuti ve surface

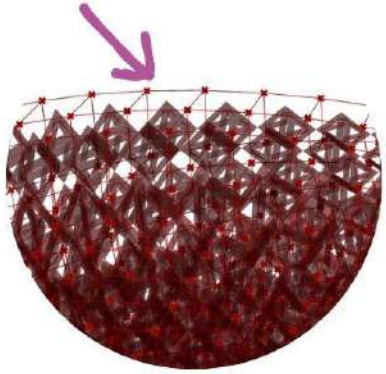
+

Platonic (mesh)









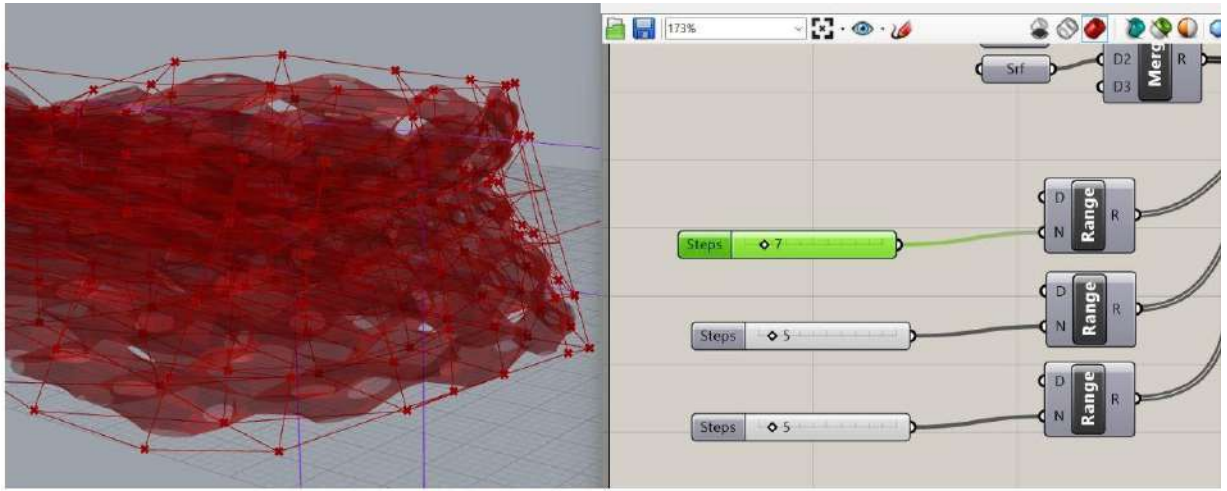
I experimented with different pattern shapes and matrices for filling.

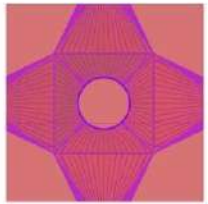
Twisted box consecutive surface

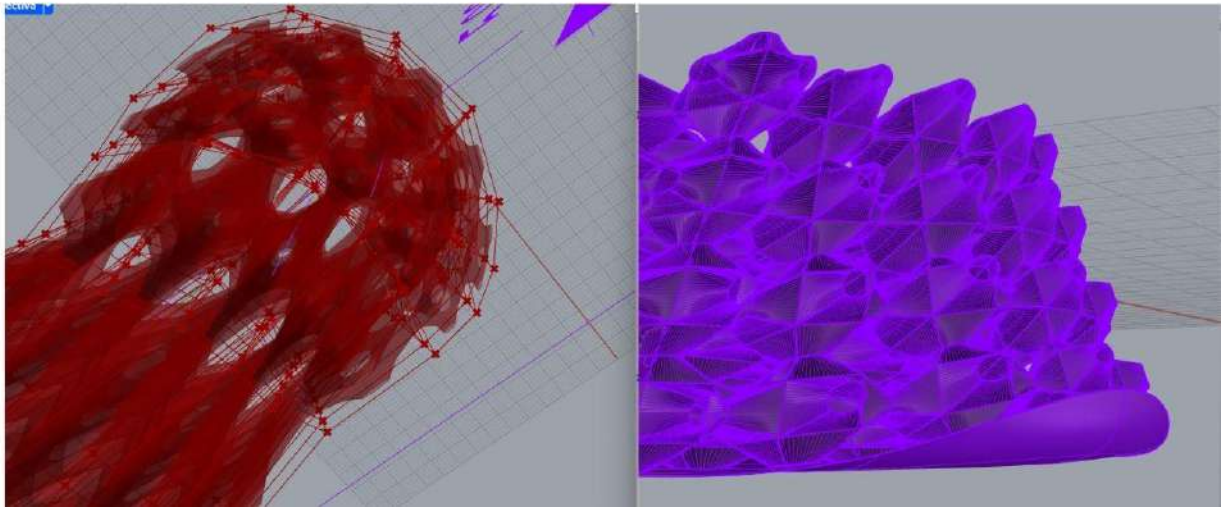
+

Module (mesh)

This version was the most suitable, but it had issues with the printing software.



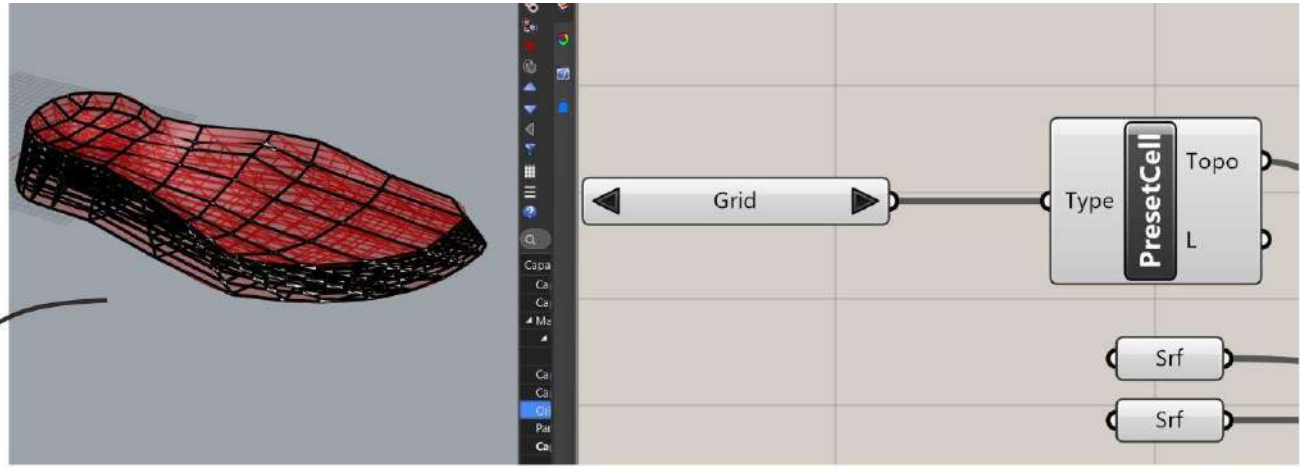


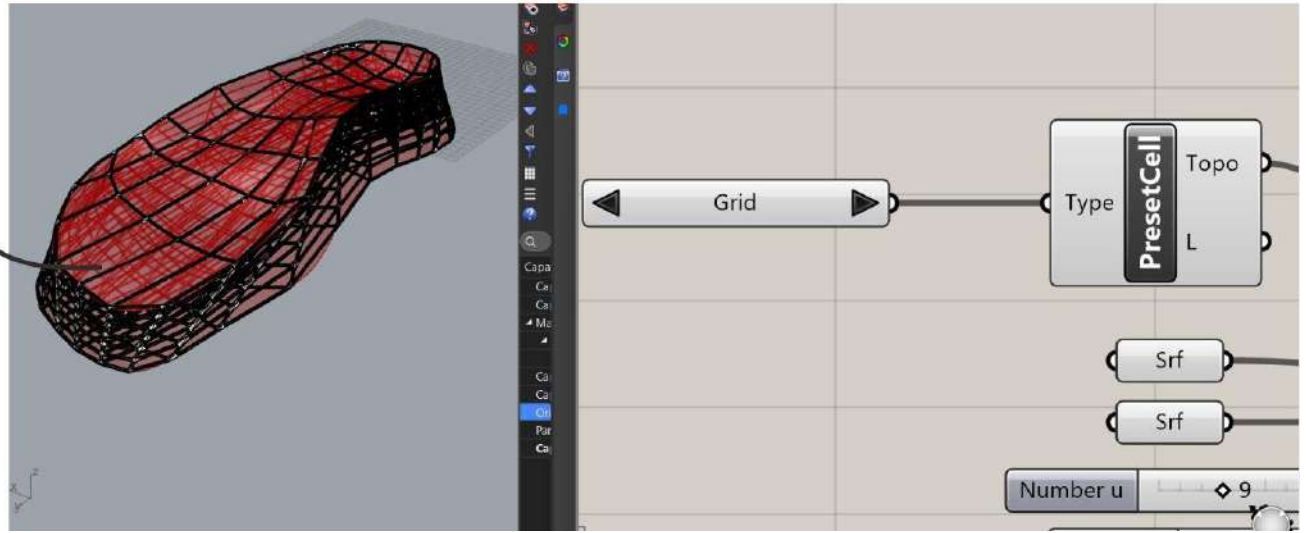


PresetCell

+

Grid

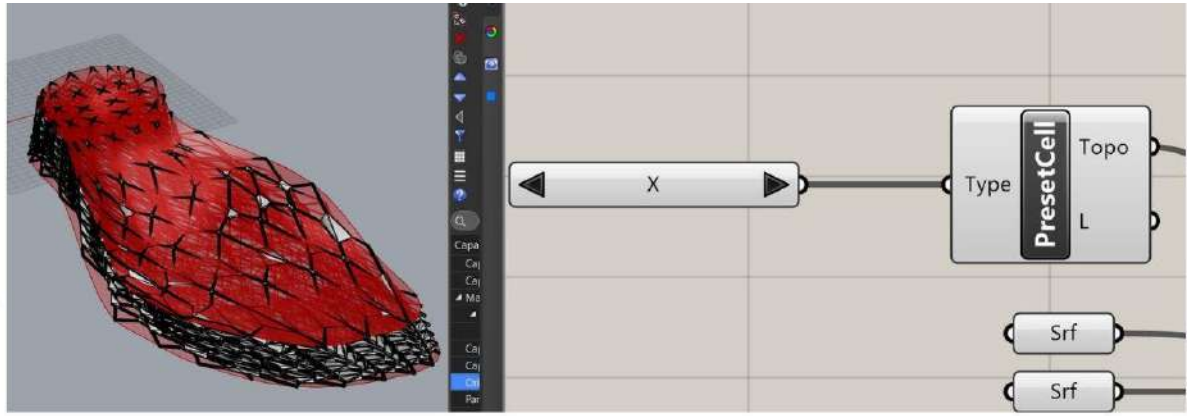


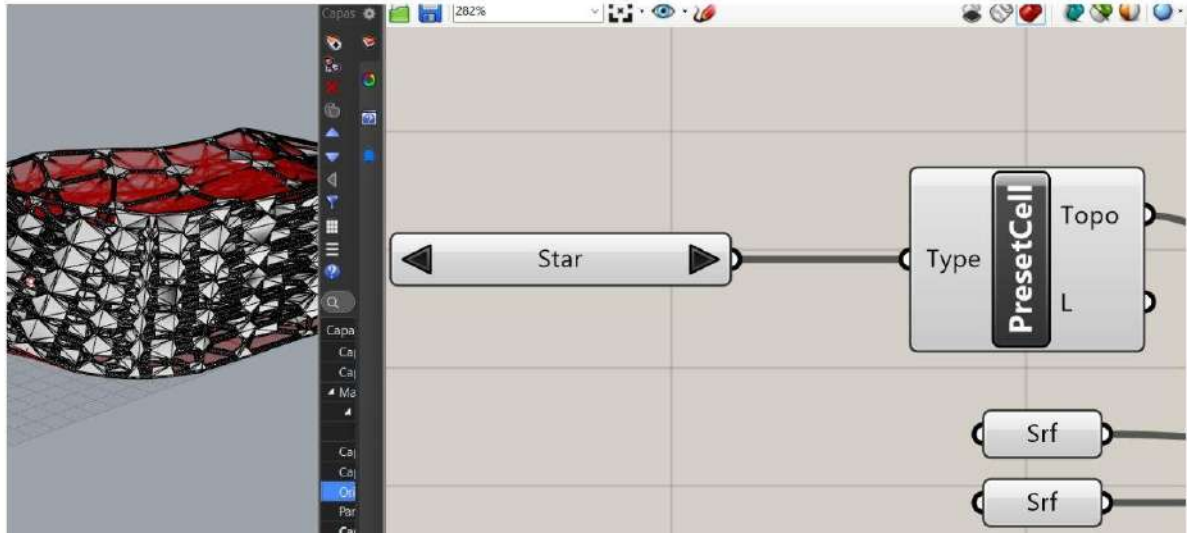


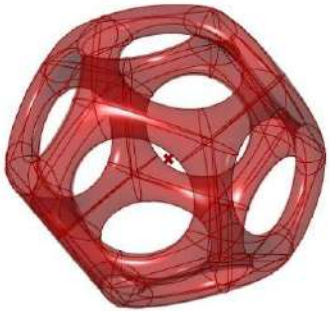
PresetCell

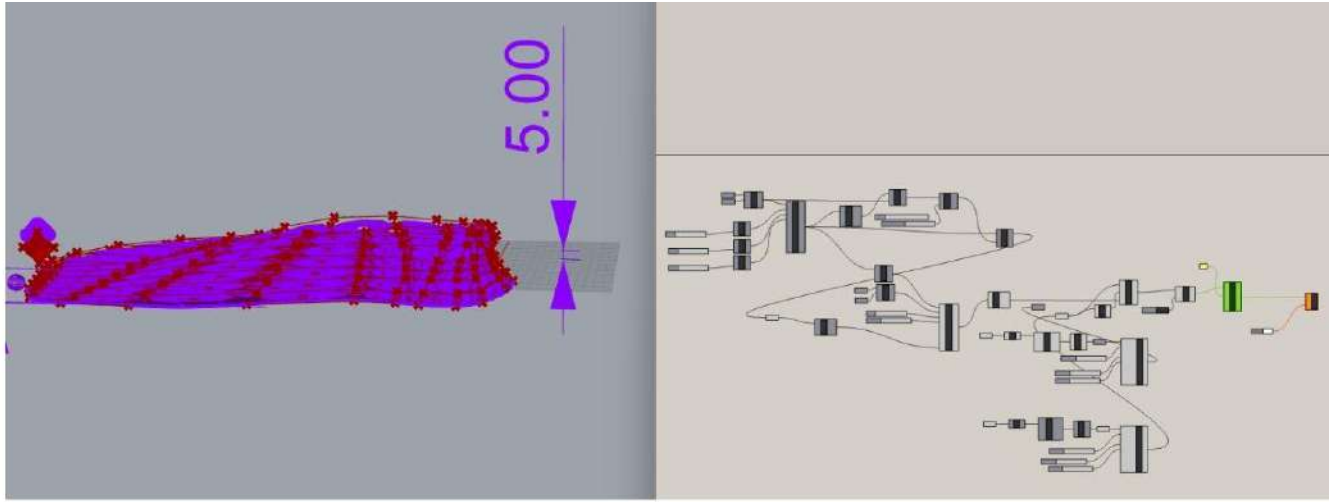
+

X, Star

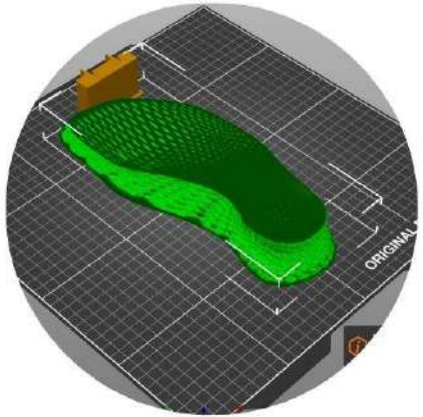


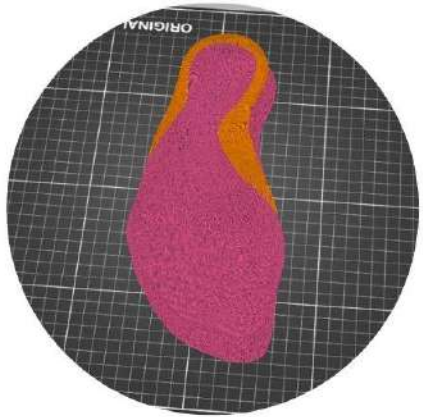


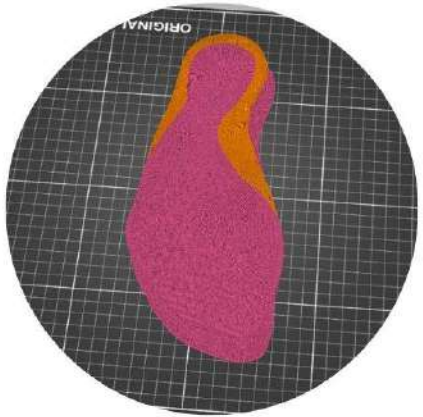




This is the option I decided to test at a 1:1 scale, as it was the most structured.

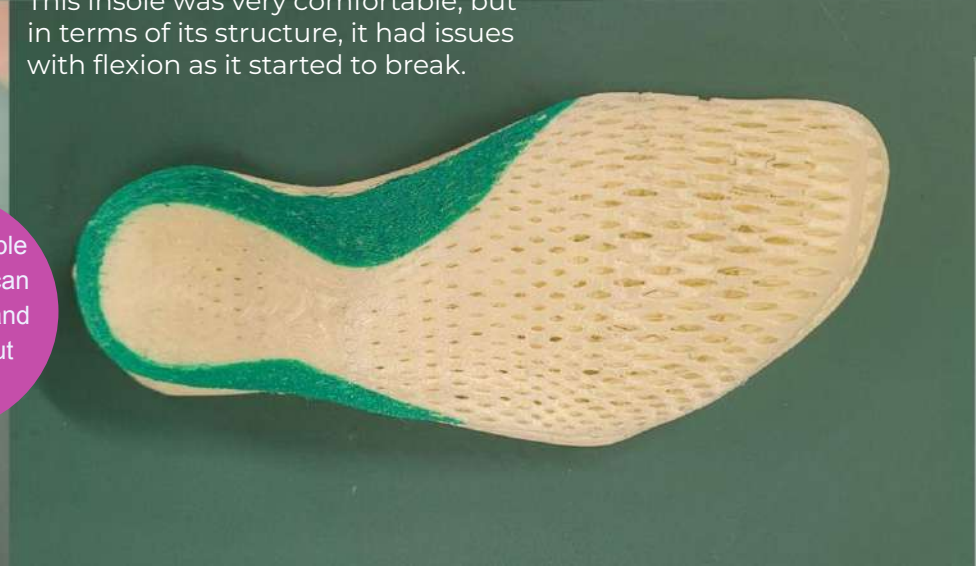






This insole was very comfortable, but in terms of its structure, it had issues with flexion as it started to break.

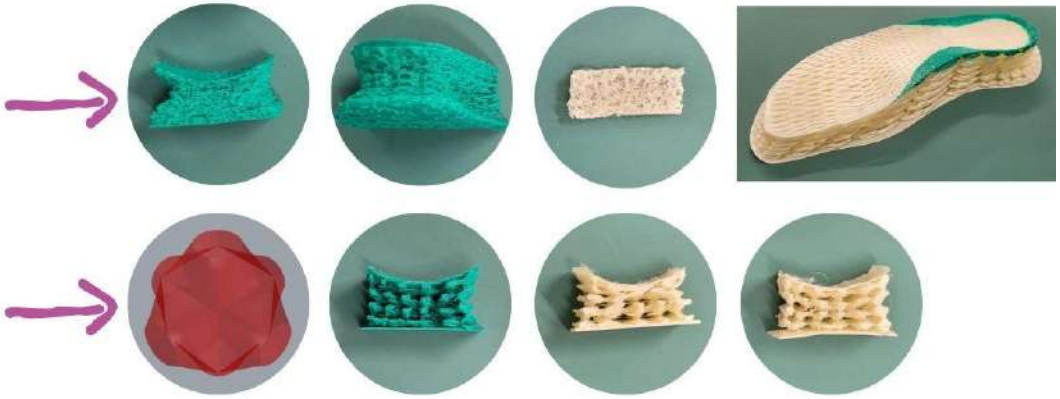
TPU is a flexible polymer that can be stretched and flexed without breaking.



Twisted box consecutive surface

+

Platonic (mesh)

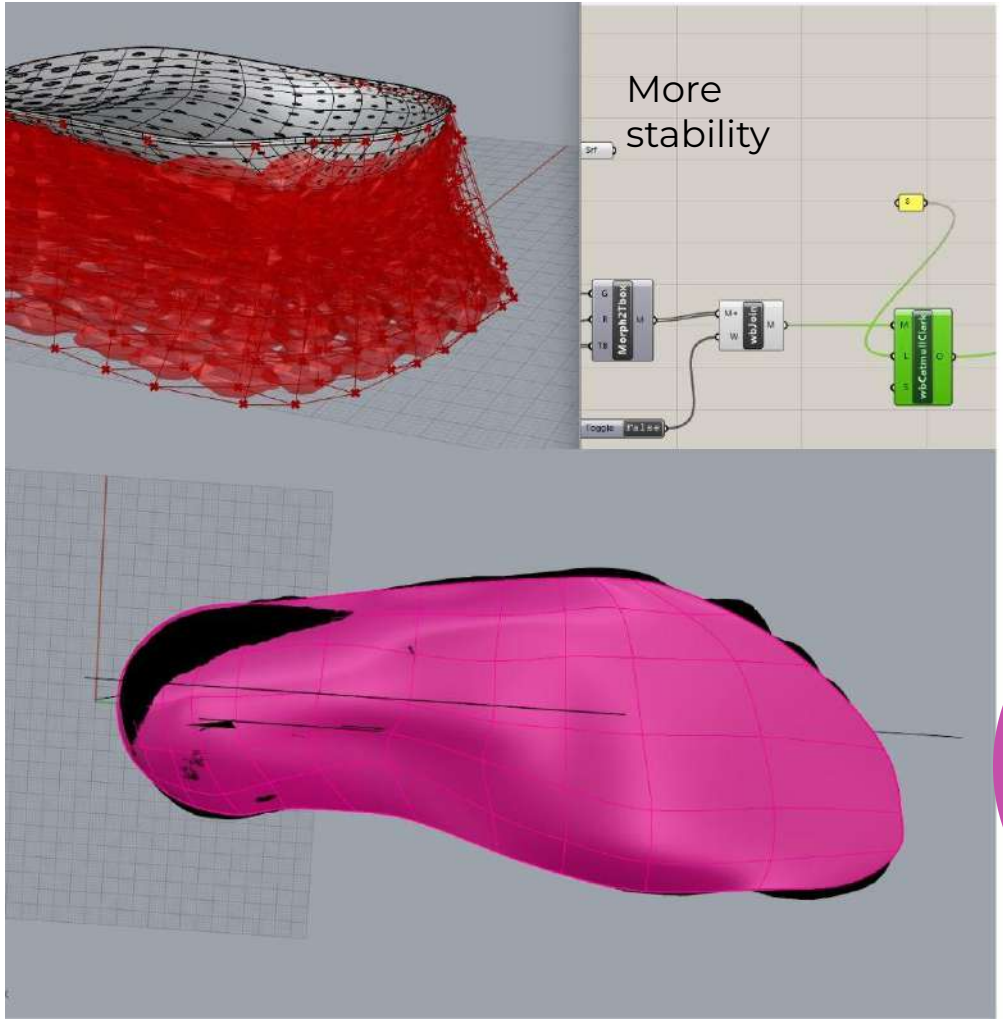


PresetCell

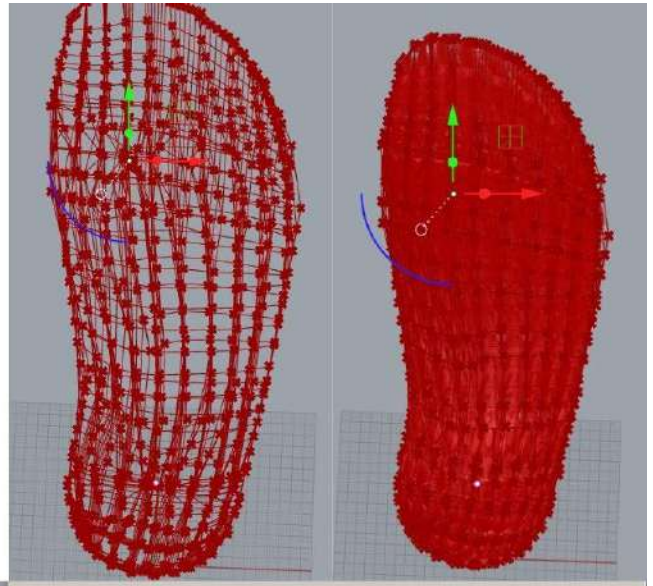
+

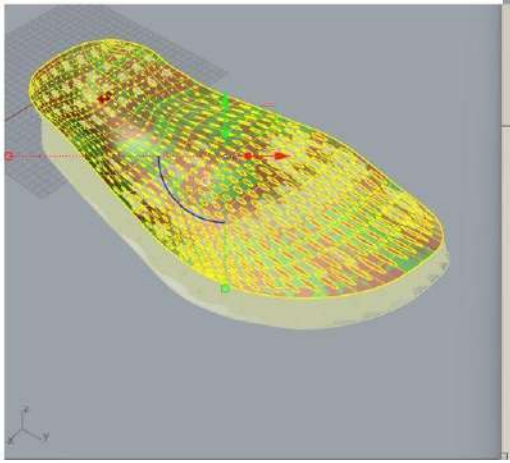
Grid, X, Star

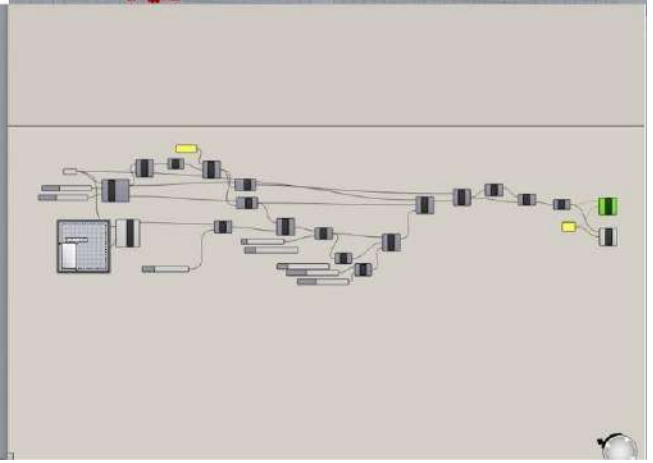
I decided to go back to the version with better resistance in the pressure tests, so I restructured the module and the design in Grasshopper.

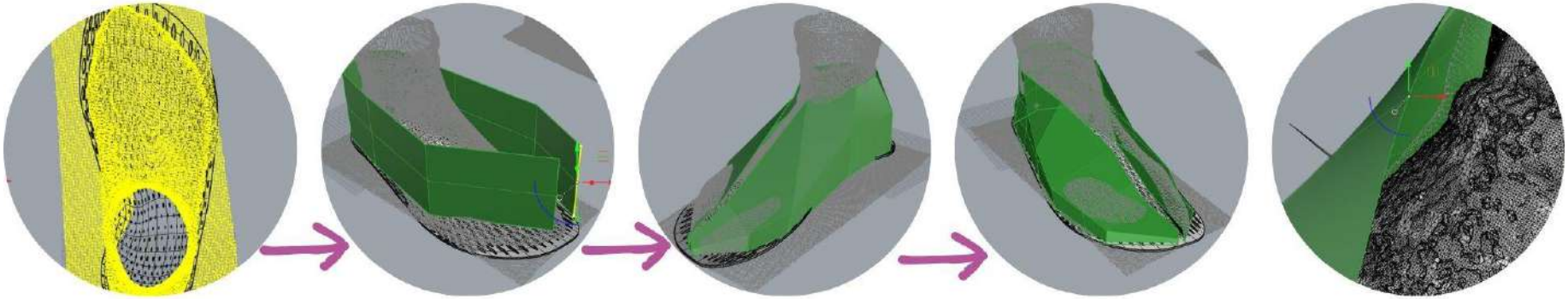


I also made an improvement in the dimensions of the insole.



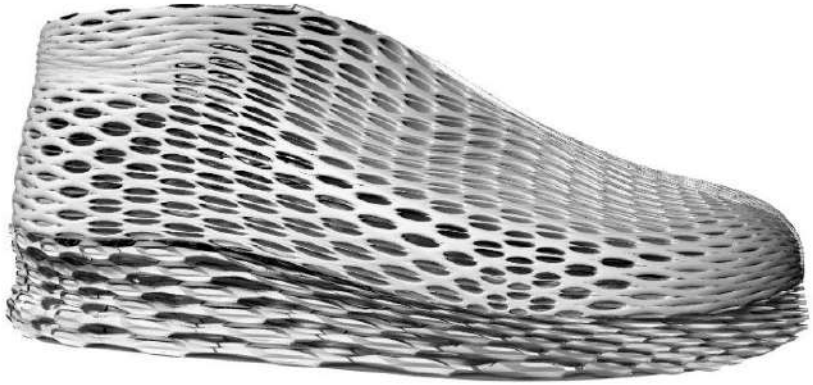


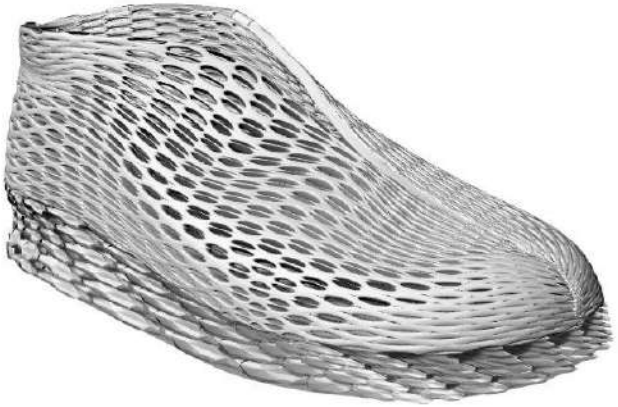


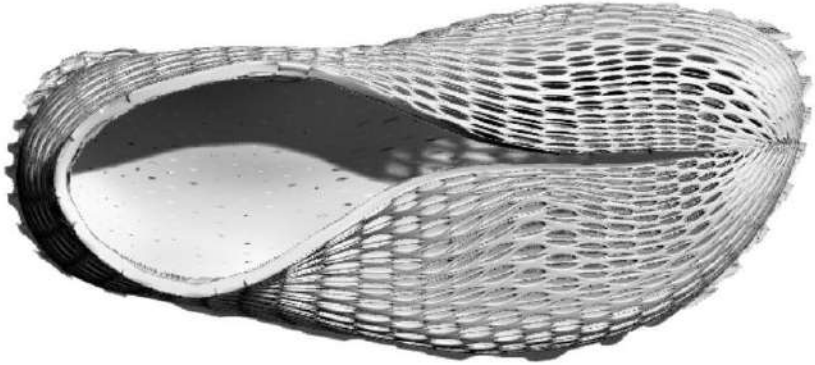


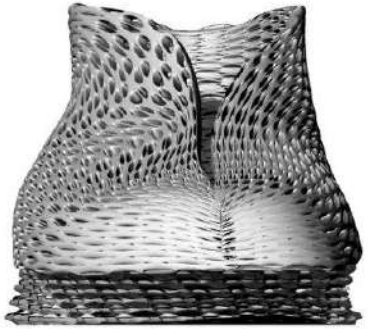
And finally, I designed the shape of the shoe's covering. It has a central opening where I will place laces, as a shoe secured to the foot generates more stability.
Version A was the most appropriate, as option B had weak points where it could start to break.

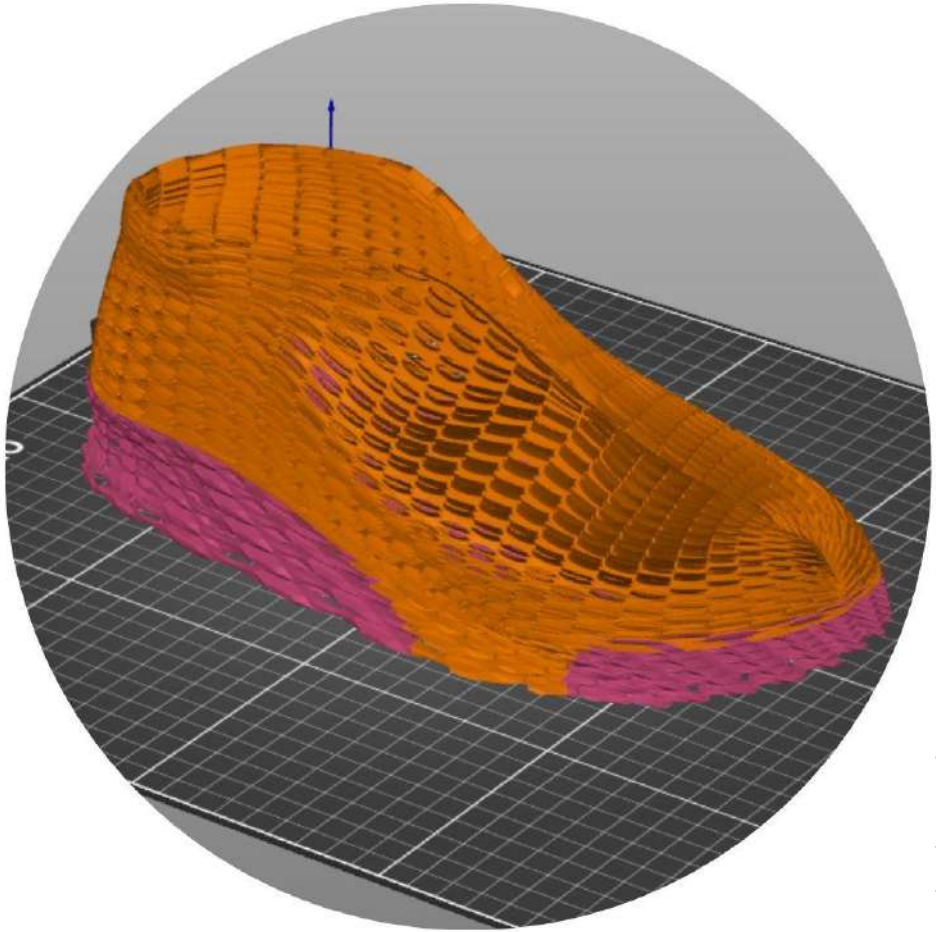
RESULTS

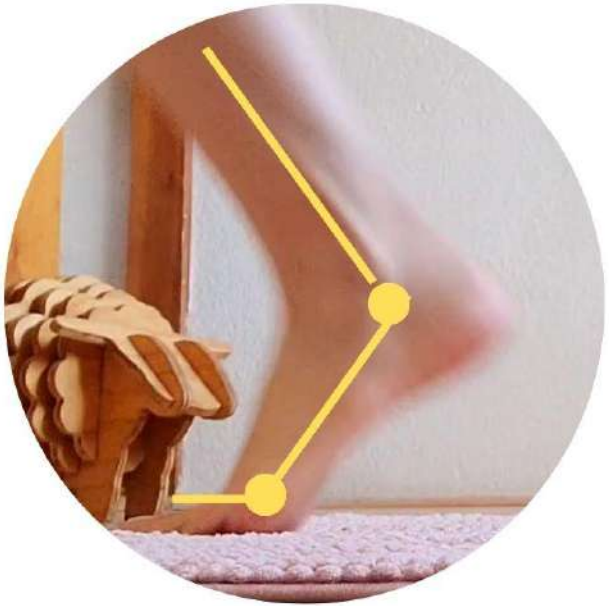












In the printing process, I will combine two different TPUs, as one is more durable than the other. The more resistant material will be used for the sole, except for the area where the foot flexes, which will be made with the more flexible TPU.