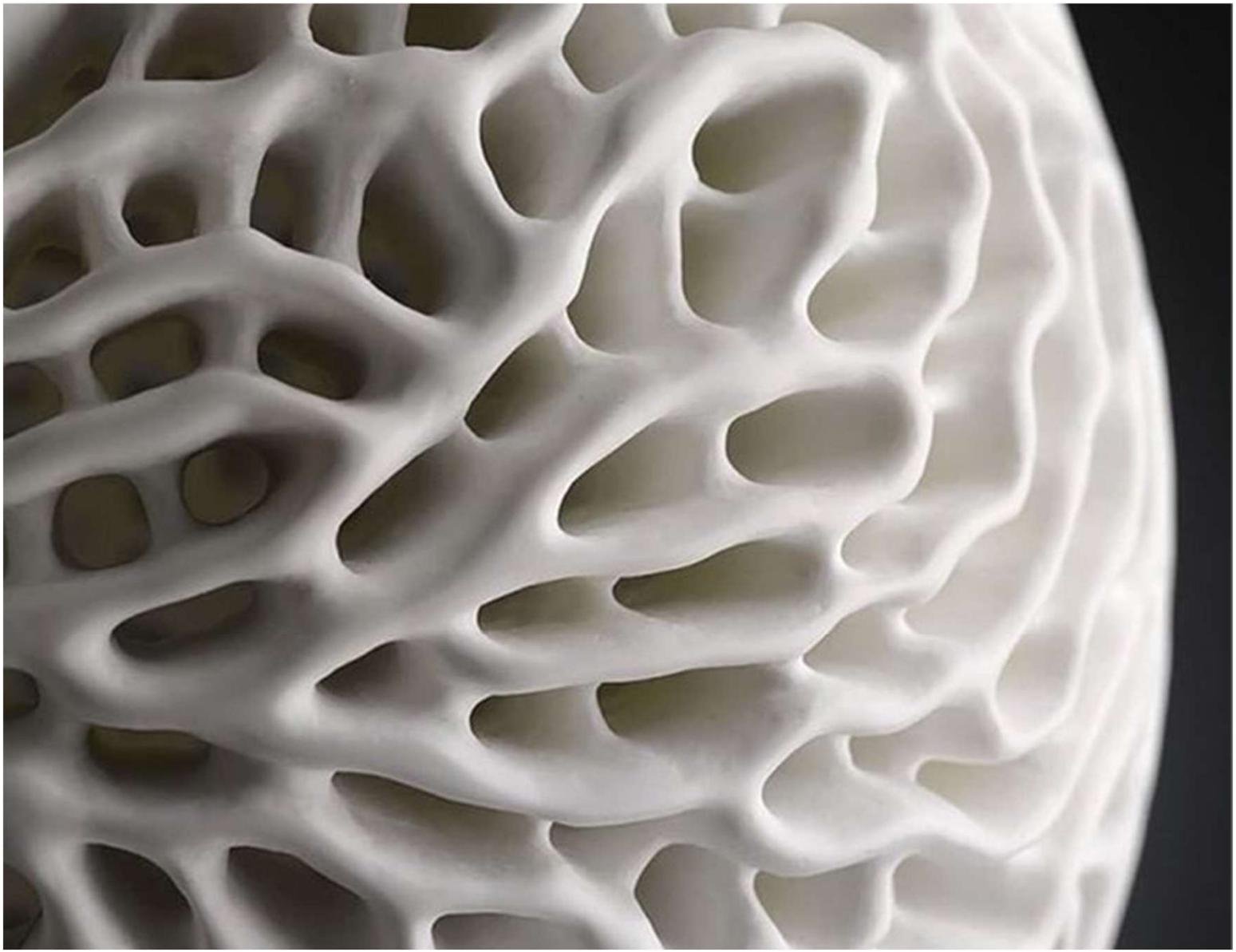

ISIA Firenze

Stampa 3d, 4d, tecniche manifattura additiva, design algoritmico

Tecnologie per la Mass Customization

ISIA
Processi di produzione e advanced manufacturing

Faculty:
Francesca Parotti

Relatore:
Lorenzo Masini

Robotica e Additive manufacturing:
Tecnologie per la Mass Customization

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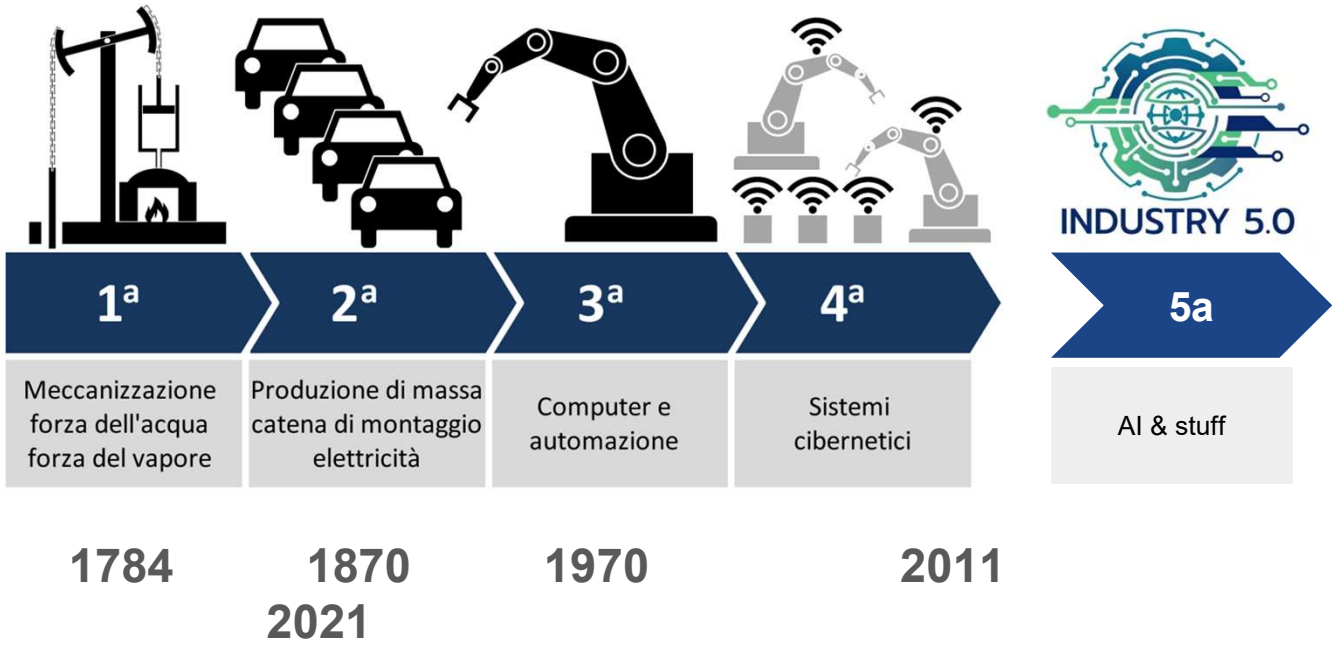
1/Introduzione


1ª
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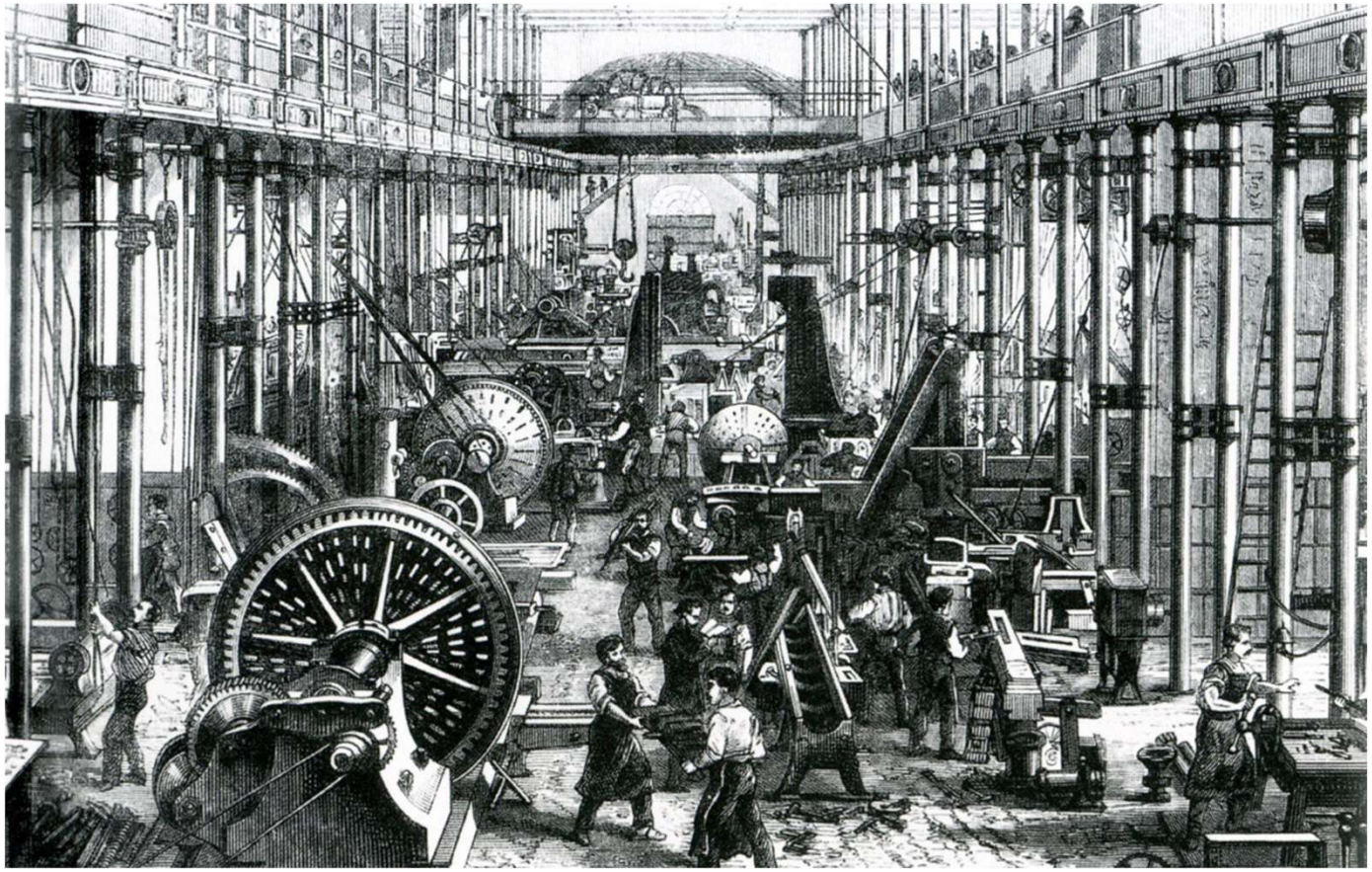
5a
INDUSTRY 5.0
Meccanizzazione
forza dell'acqua
forza del vapore
Produzione di massa
catena di montaggio
elettricità
Computer e
automazione
Sistemi
cibernetici
AI & stuff
1784
1870
2021
1970
2011

1/Introduzione



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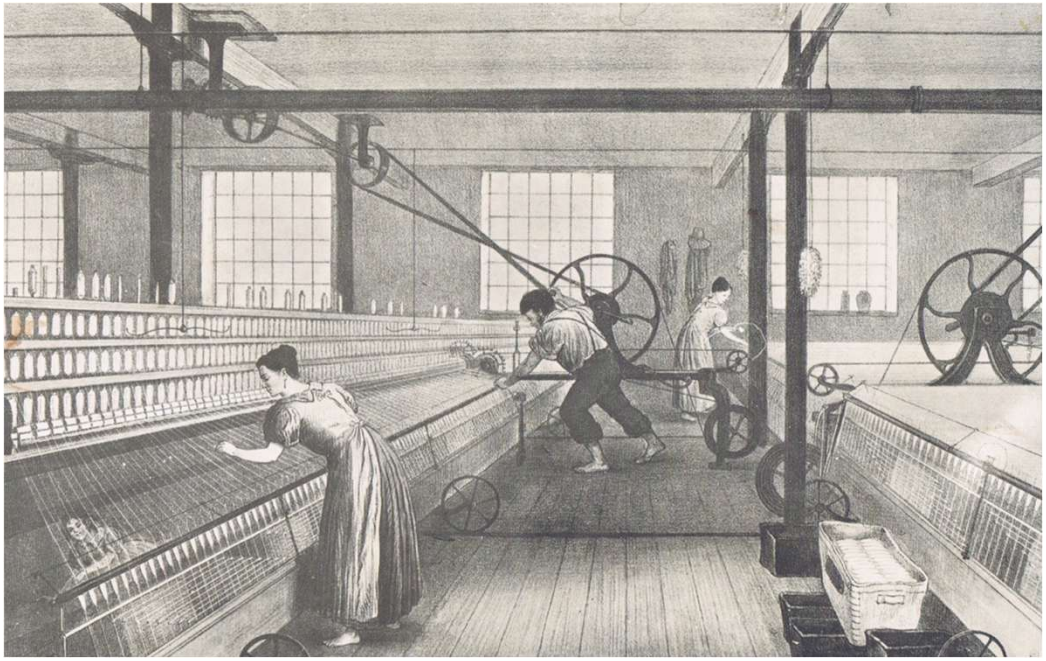
1/Introduzione





1/Introduzione



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1/Introduzione



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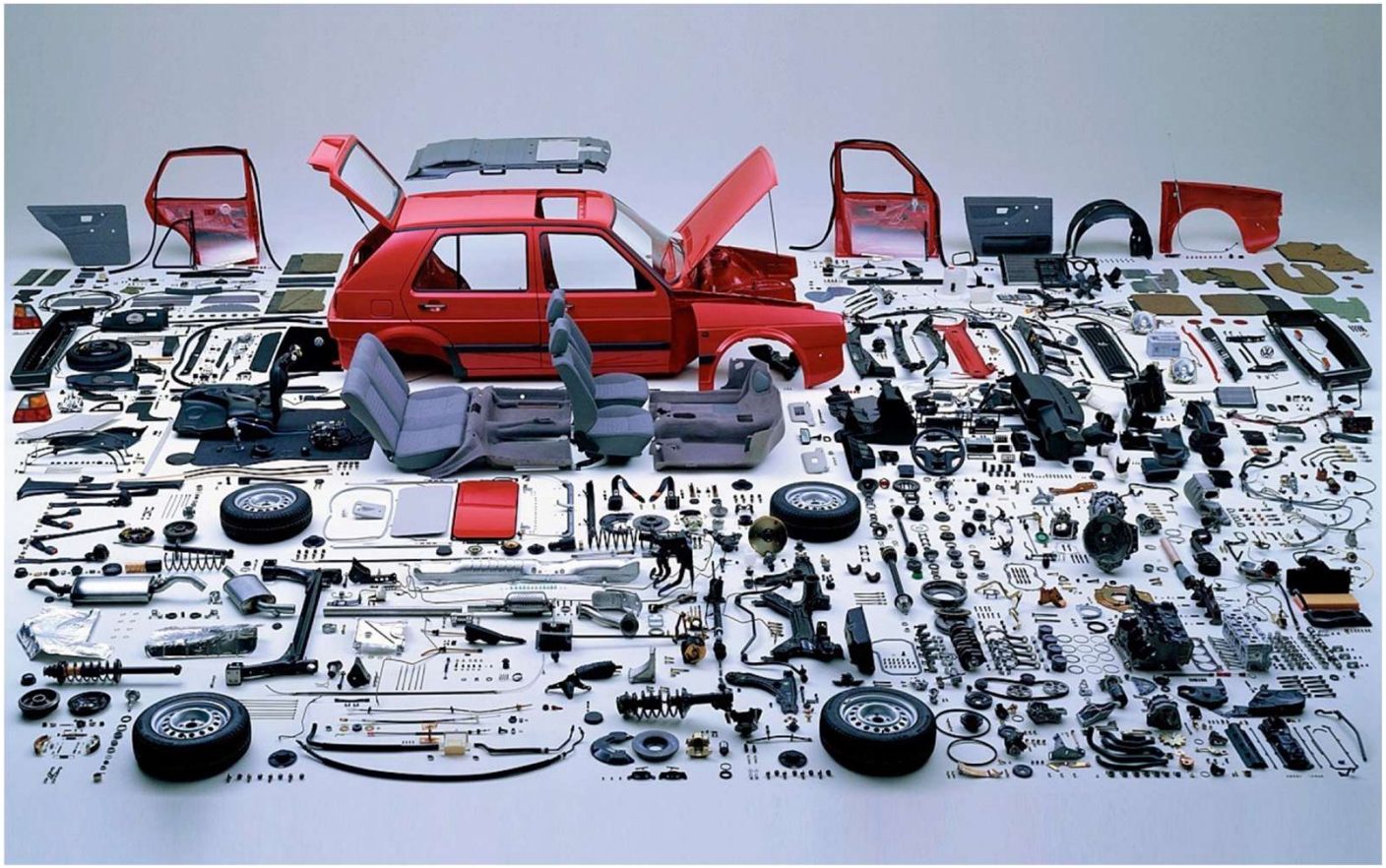
1/Introduzione



1/Introduzione





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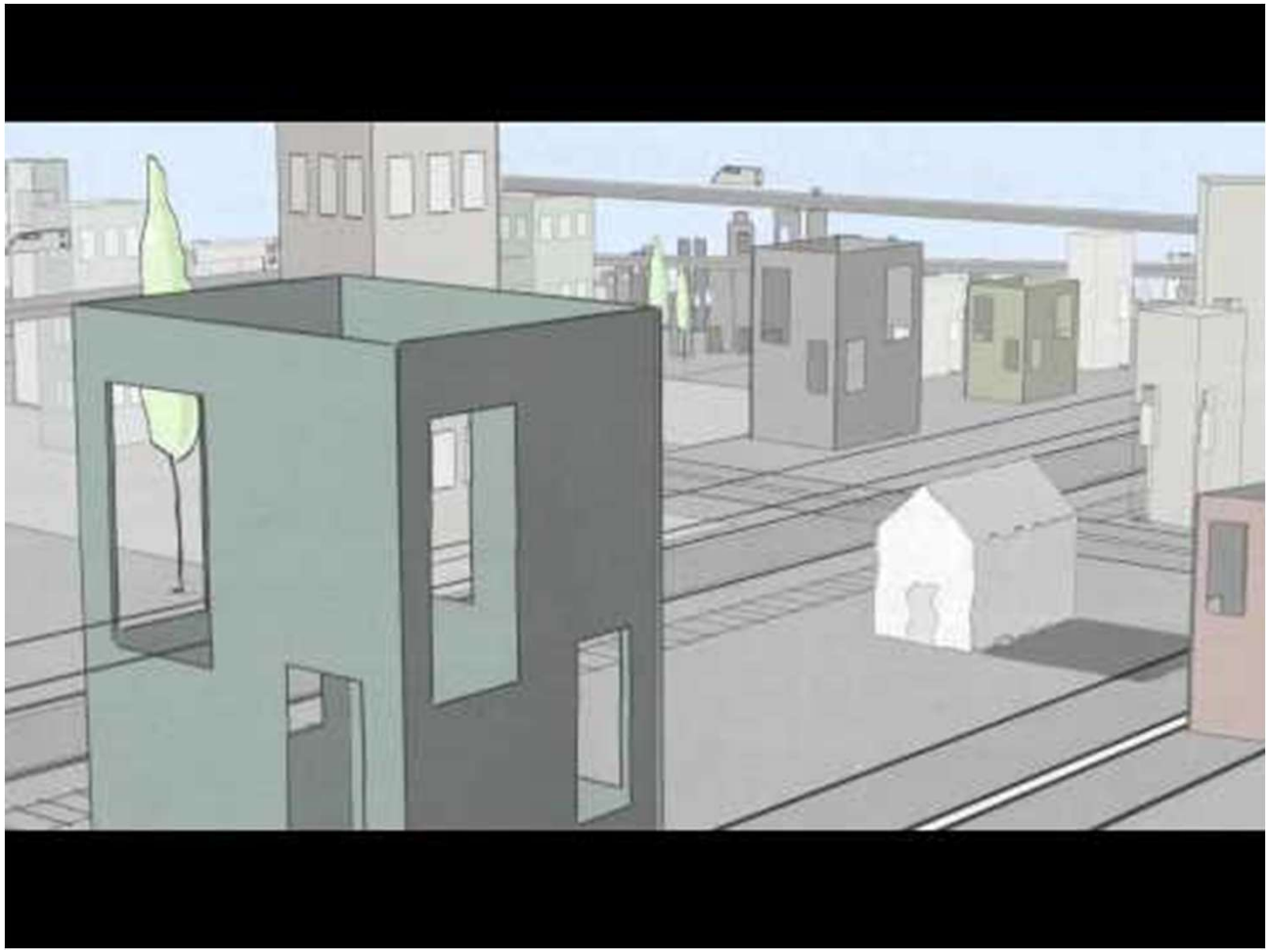

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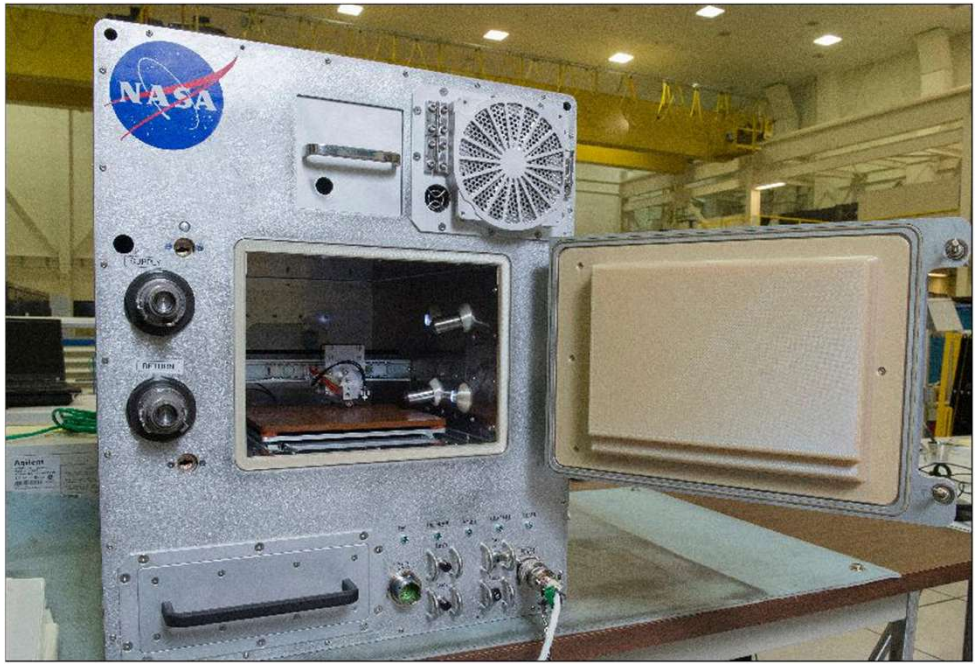



1/Introduzione



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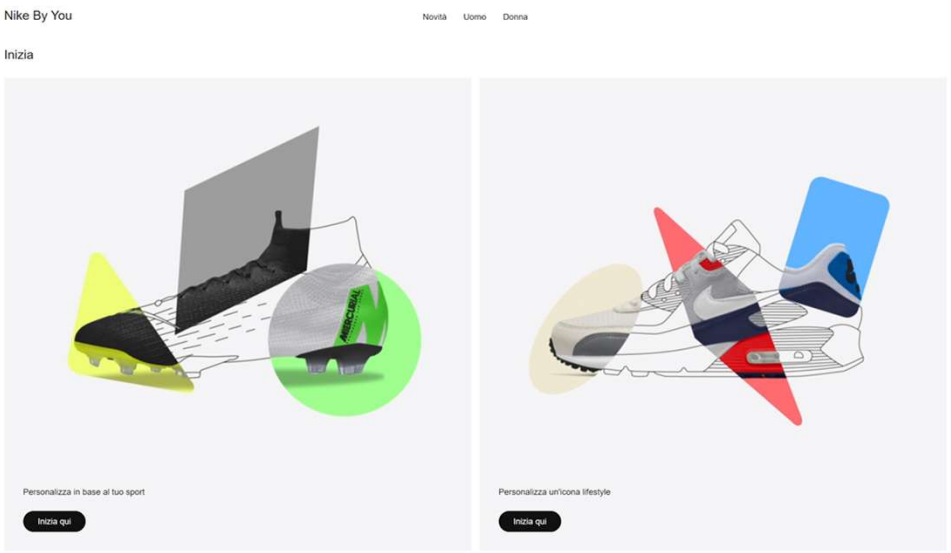

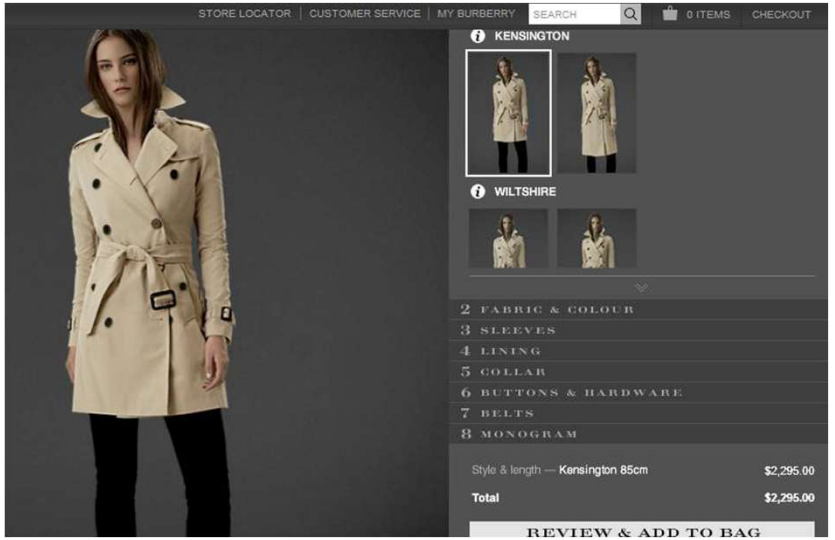

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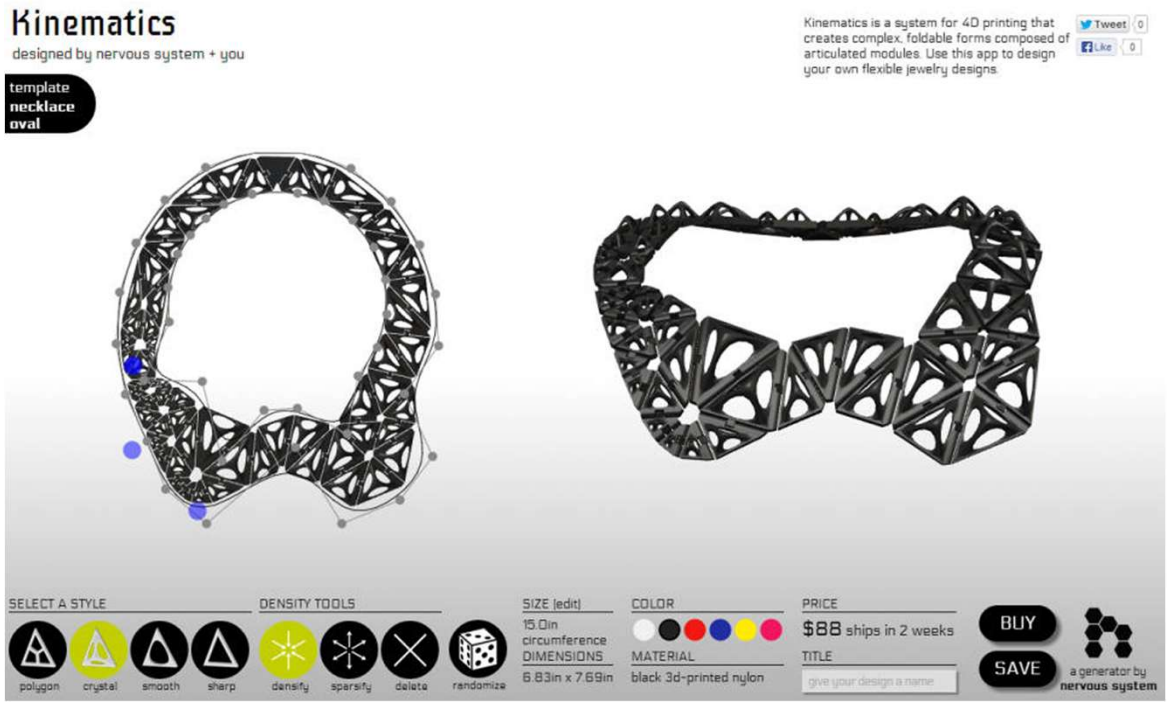



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1/Introduzione

< Collection



Tisch 01

€35,00

Design / Production:

Design Only | Design + Production

Shape Presets +

Dimensions (mm) +

Leg Position (mm) +

Material & Thickness (mm) +

Personalized Engraving +

BUY NOW

1. Choose from either:

'Design Only' - for purchasing a customized manufacturable CNC file (.DXF) that can be used for DIY purposes.

or

'Design + Production' - for ordering a finished customised table ready for assembly at Home

2. Customize your Design:

Using the configurator panels above to adjust parameters like Length, Width, Height and the Radius on the corners. You can also adjust the positioning of the legs based on their distance from the corners.

If you are ordering a finished table from us, you can choose from the list of currently available materials - Plywood, Valchromat or Solid Wood.

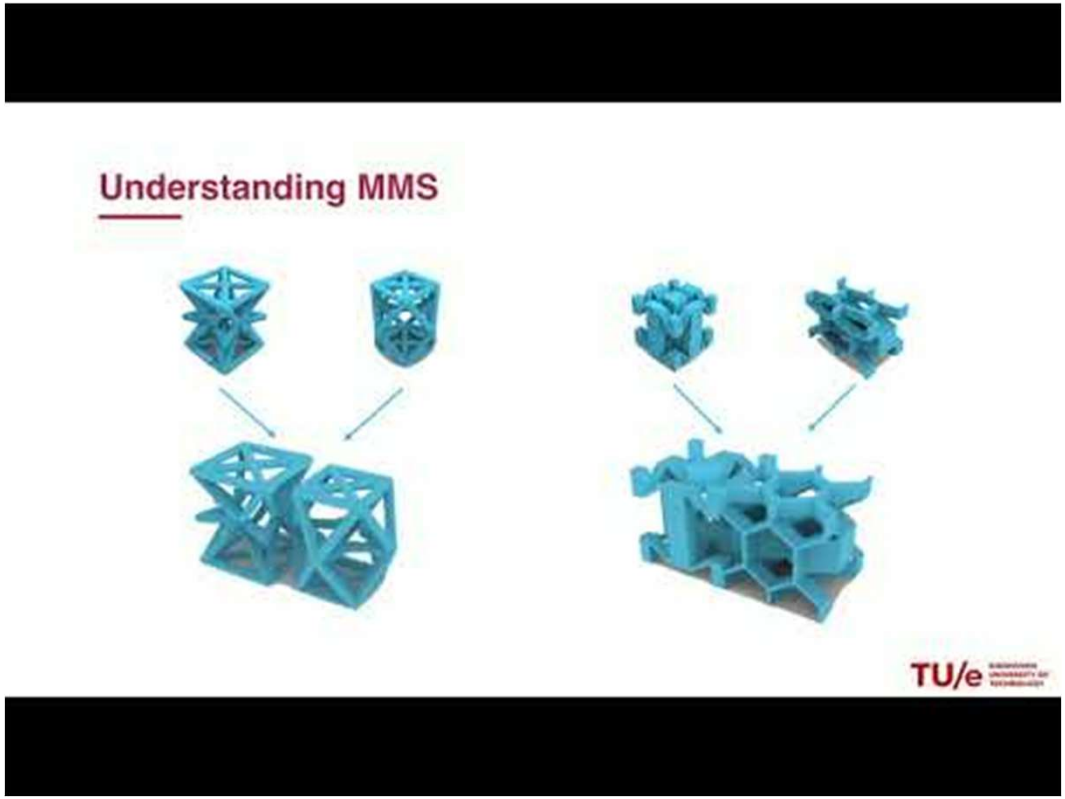
Once complete, you can also personalize the table by having your details engraved into the piece.

3. Once an Order is made:

We will be in touch to confirm all the details and let you know when your table will be completed and delivered - Current lead time 4-5 weeks.

If you have ordered a CNC file for DIY production, we will prepare the file and then email it to you (within 1-2 days) along with documentation and technical drawings to help you though the making process.

1/Introduzione



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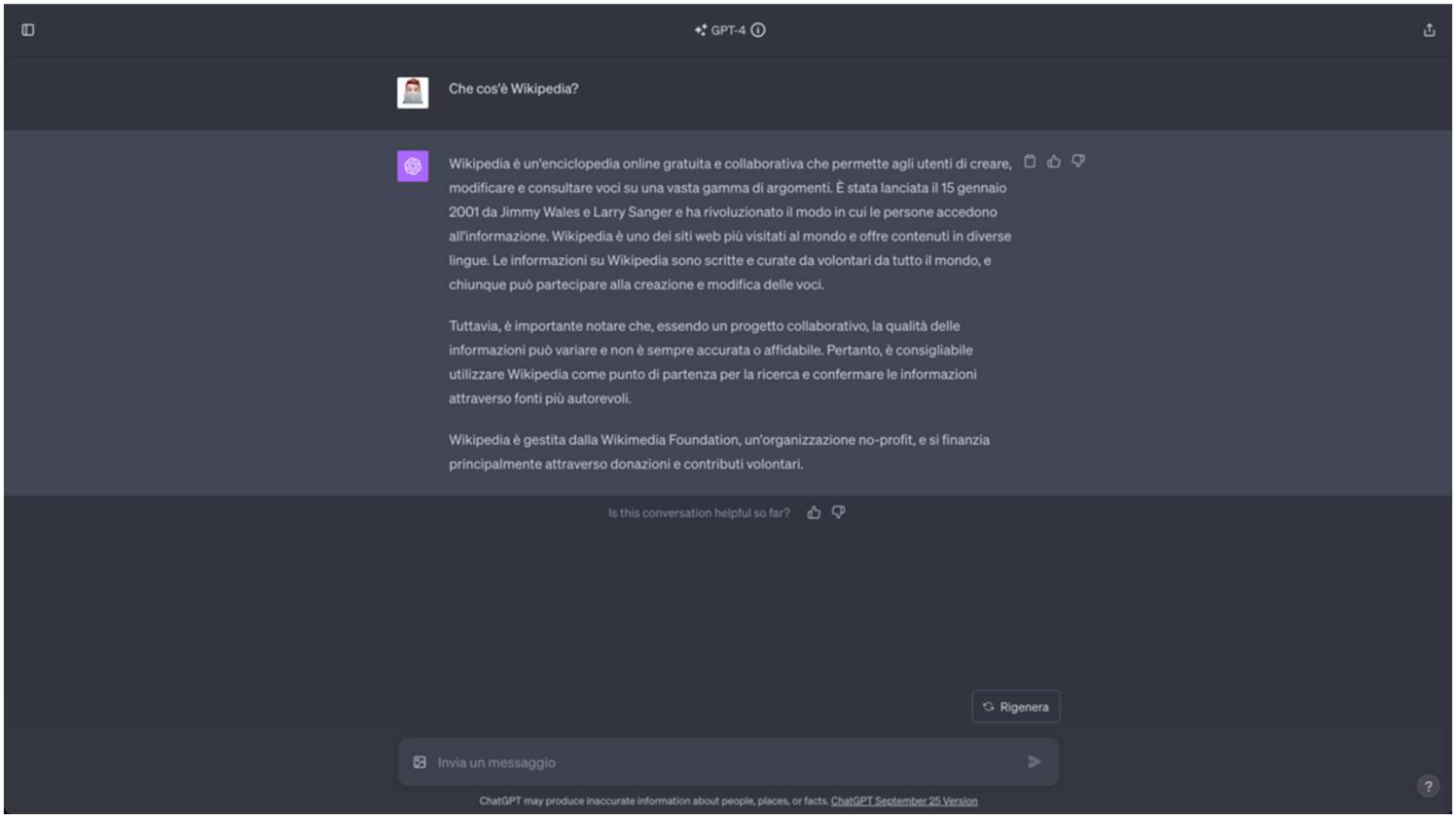
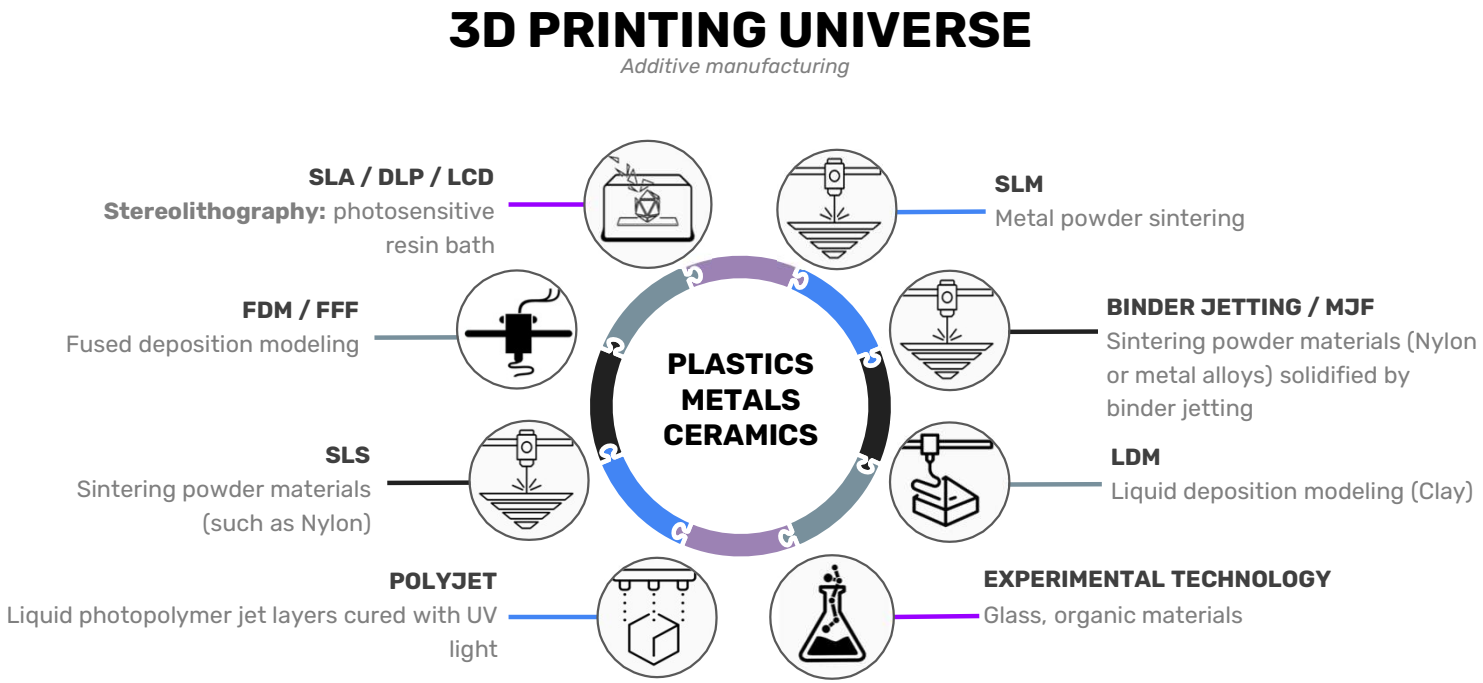
1/Introduzione

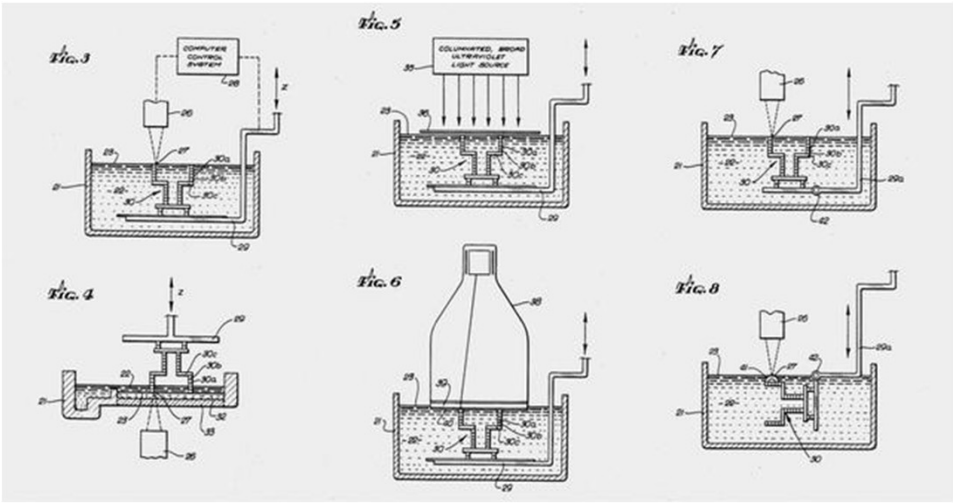


2/Additive Manufacturing


3D PRINTING UNIVERSE
Additive manufacturing
SLA / DLP / LCD
Stereolithography: photosensitive resin bath
SLM
Metal powder sintering
FDM / FFF
Fused deposition modeling
BINDER JETTING / MJF
Sintering powder materials (Nylon or metal alloys) solidified by binder jetting
PLASTICS
METALS
CERAMICS
SLS
Sintering powder materials (such as Nylon)
LDM
Liquid deposition modeling (Clay)
POLYJET
Liquid photopolymer jet layers cured with UV light
EXPERIMENTAL TECHNOLOGY
Glass, organic materials

2.2/Stereolitografia (SLA)





2.2/Stereolitografia (SLA)



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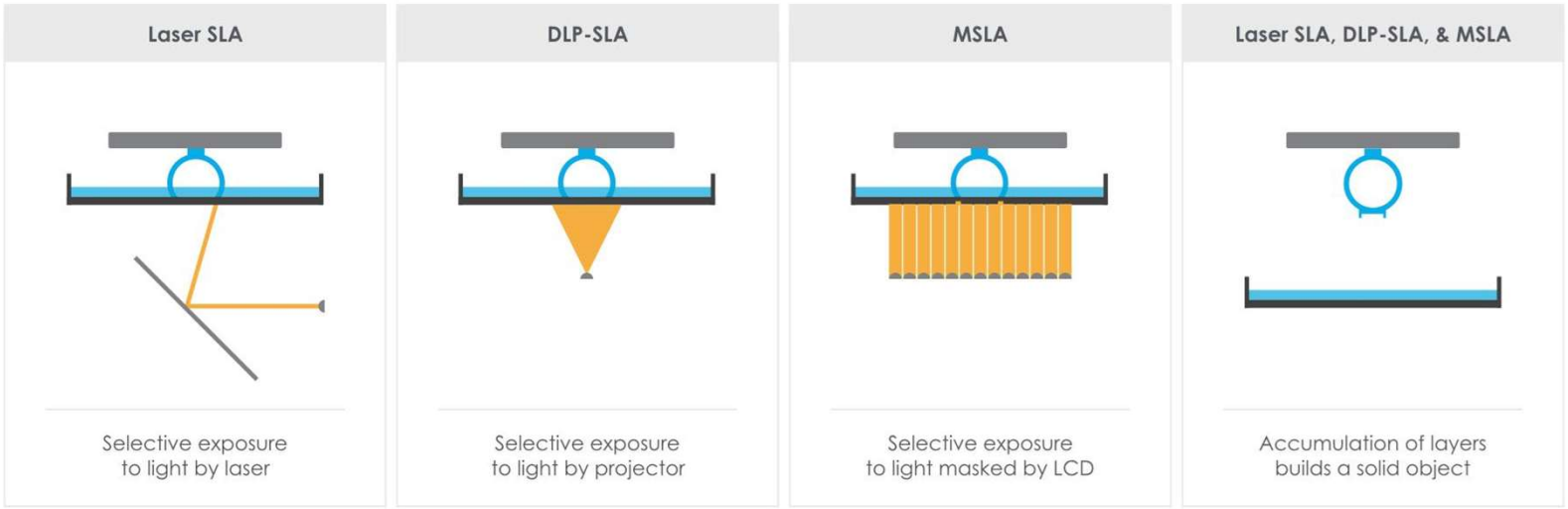
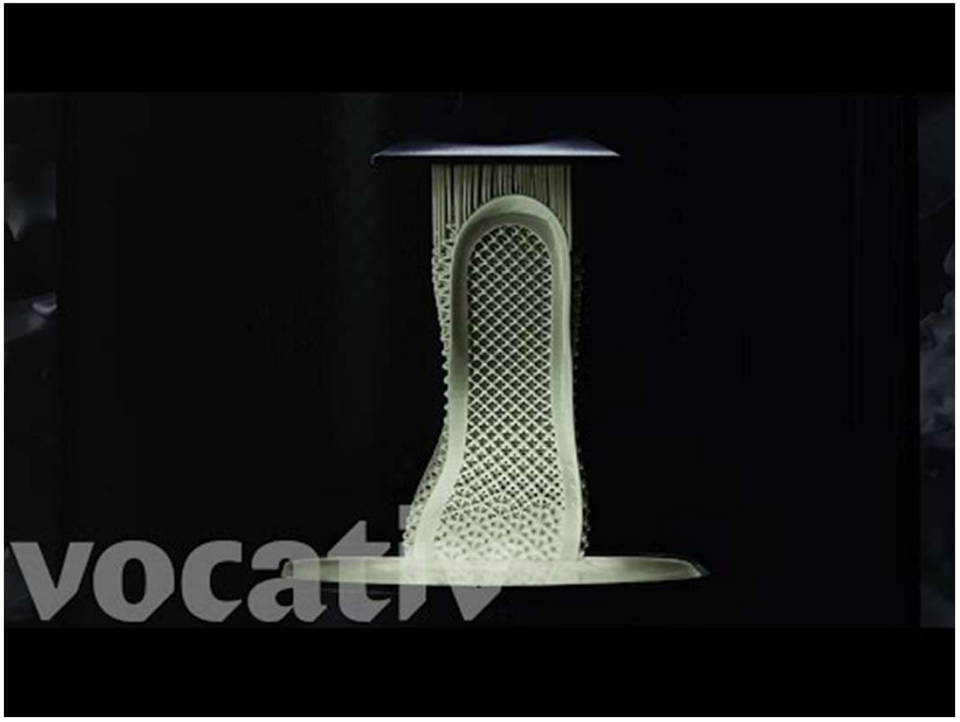
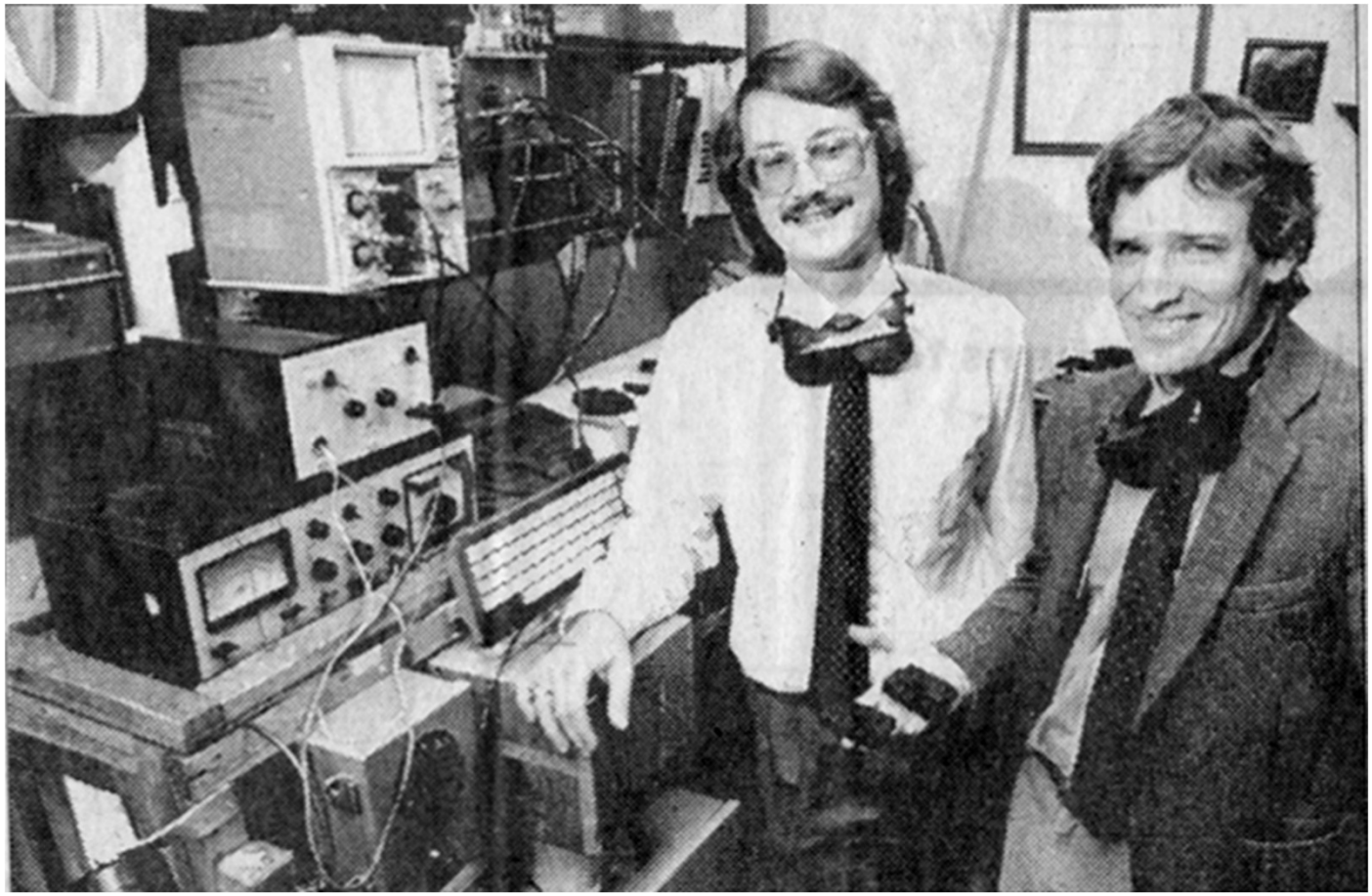


2.2/Stereolitografia (SLA)





2.3/Selective Laser Sintering (SLS)



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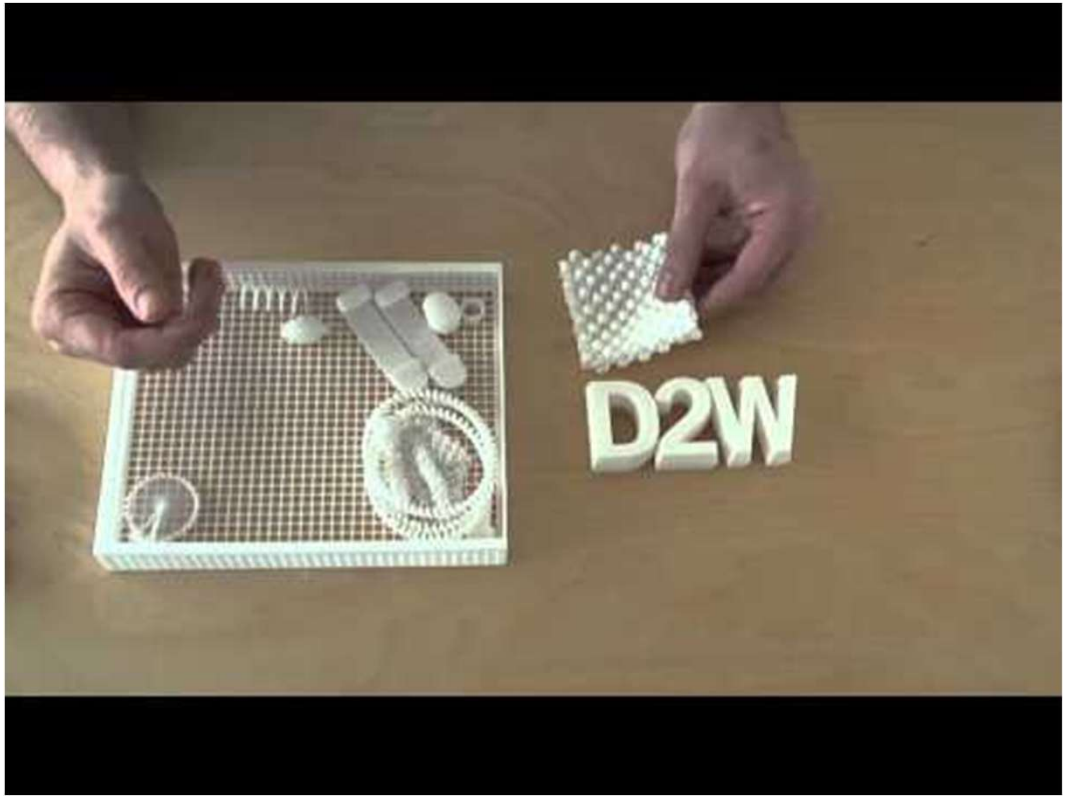
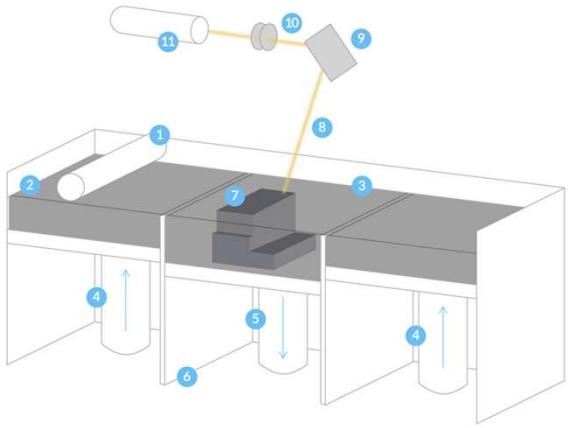
2.3/Selective Laser Sintering (SLS)





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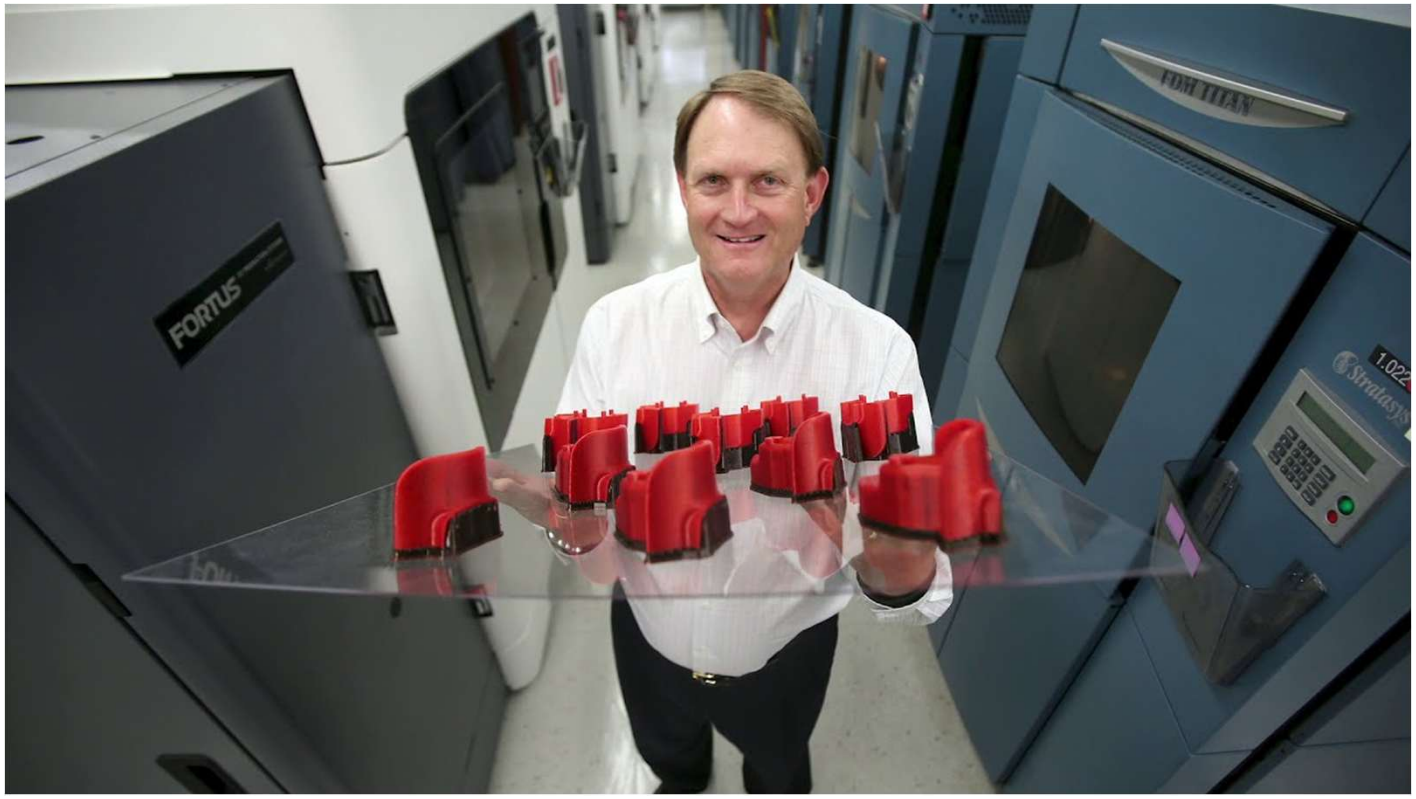
2.3/Selective Laser Sintering (SLS)



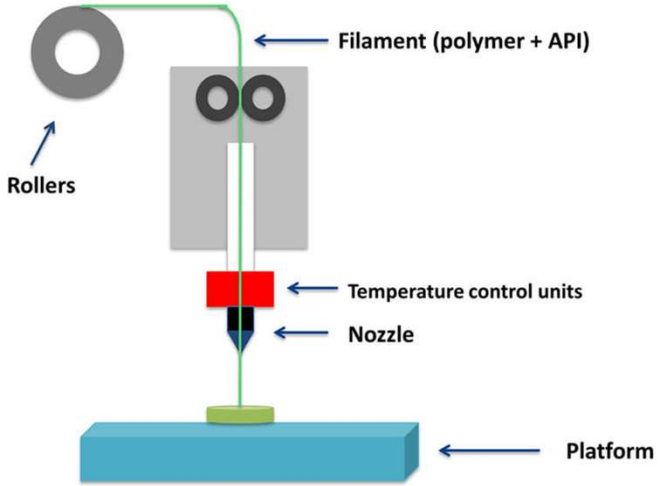


2.4/Fused deposit material (FDM)



2.4/Fused deposit material (FDM)





2.4/Fused deposit material (FDM)







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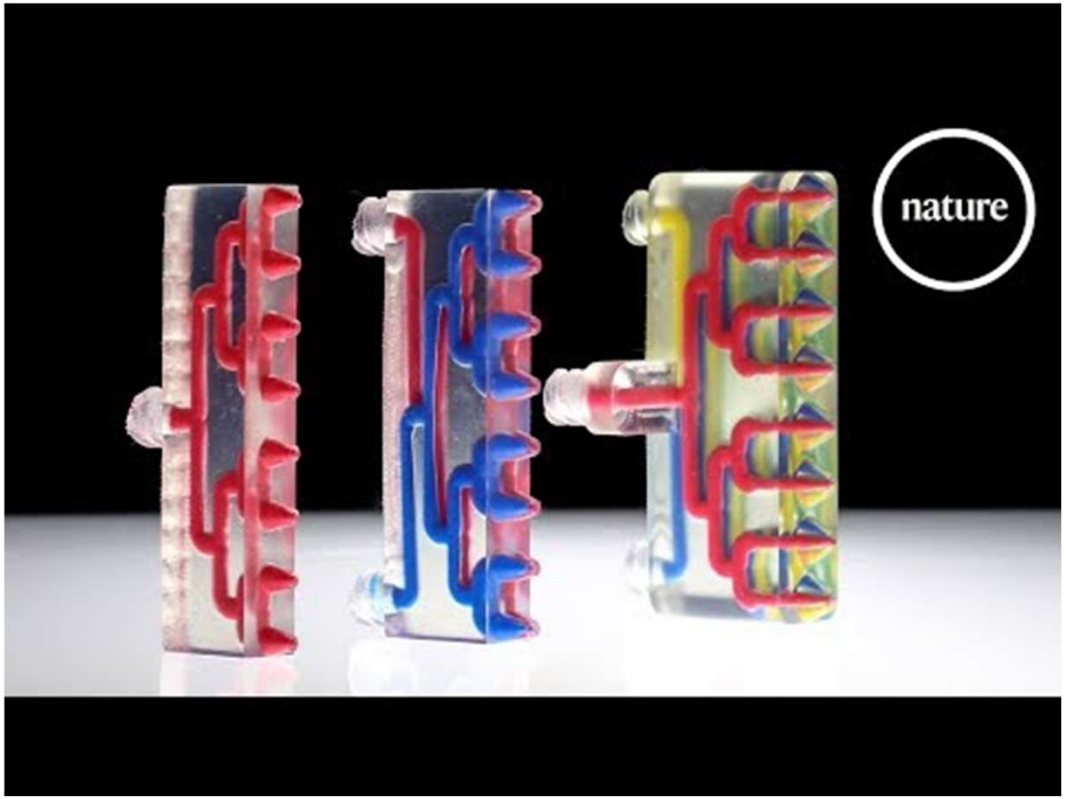

2.5/Binder Jetting



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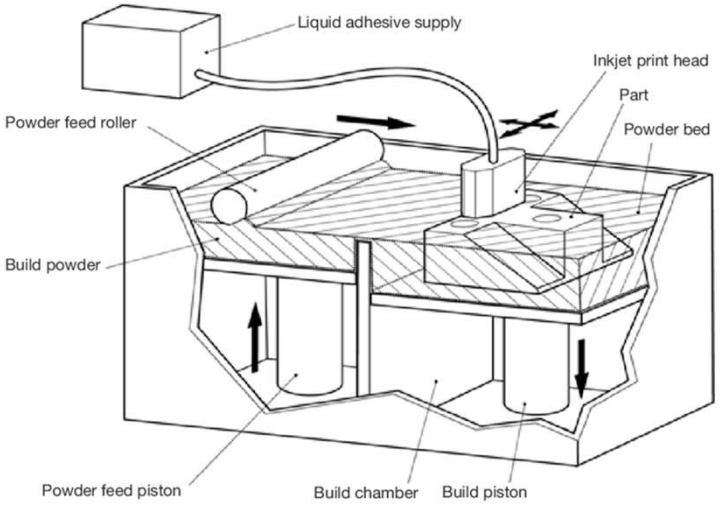
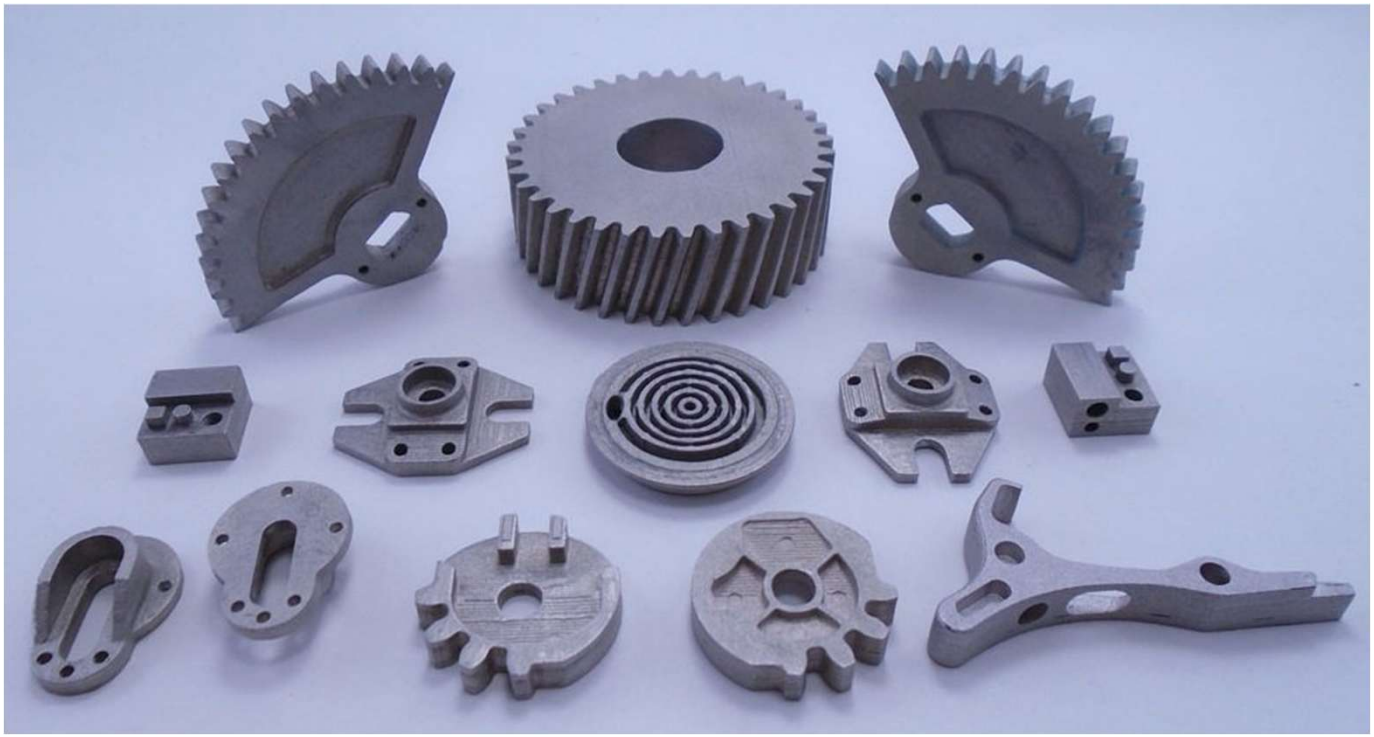
2.5/Binder Jetting





2.5/Binder Jetting



2.6/ Selective Laser Melting (SLM e DMSL)



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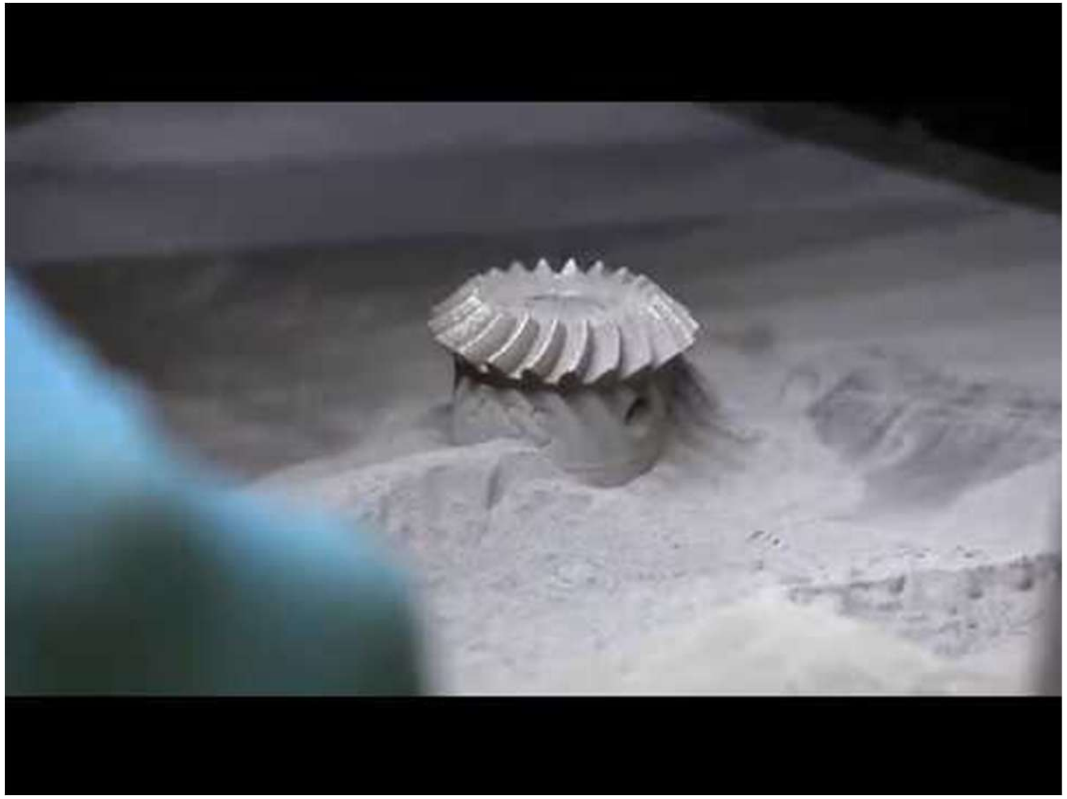
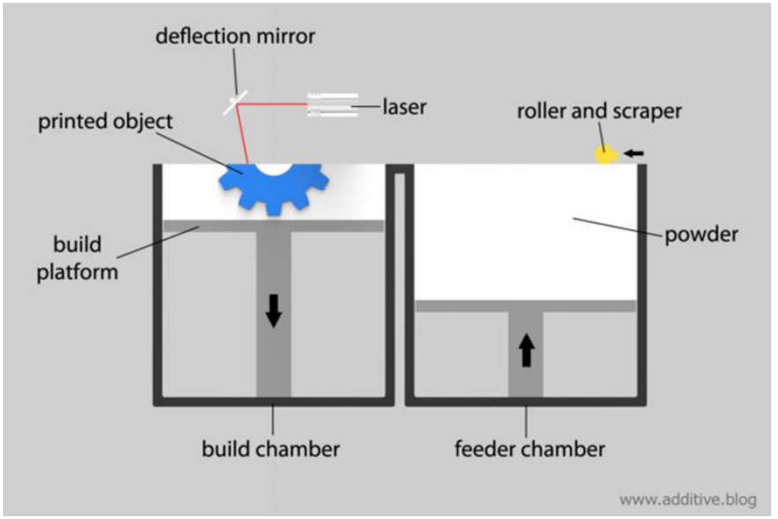
2.6/ Selective Laser Melting (SLM e DMSL)

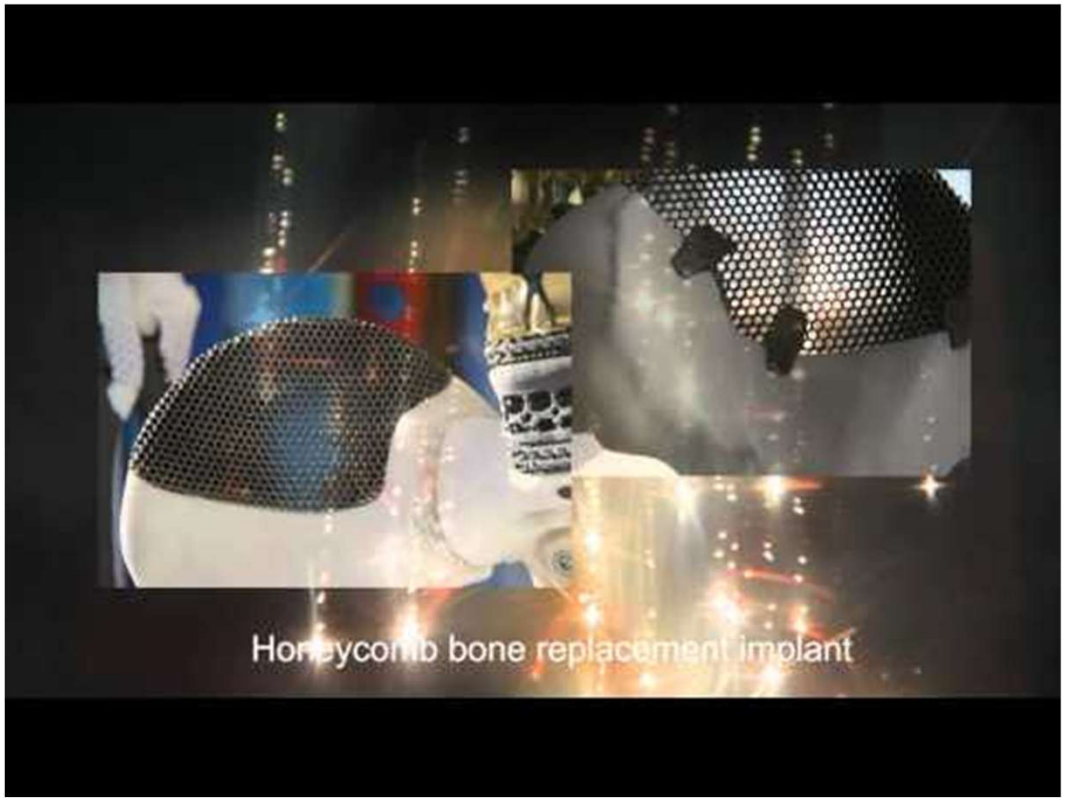


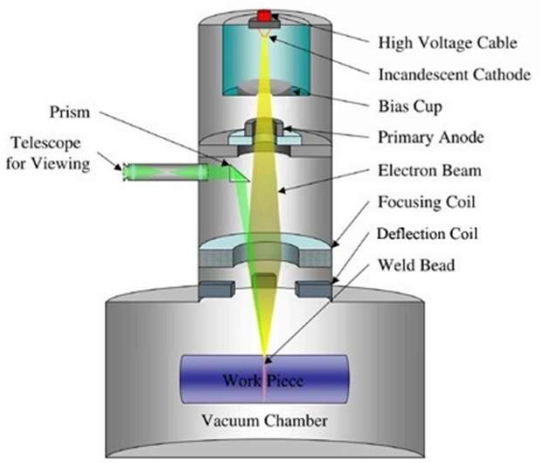


2.7/ Electron Beam Melting (EBM)



2.7/ Electron Beam Melting (EBM)





2.7/ Electron Beam Melting (EBM)







2.8/Material Jetting



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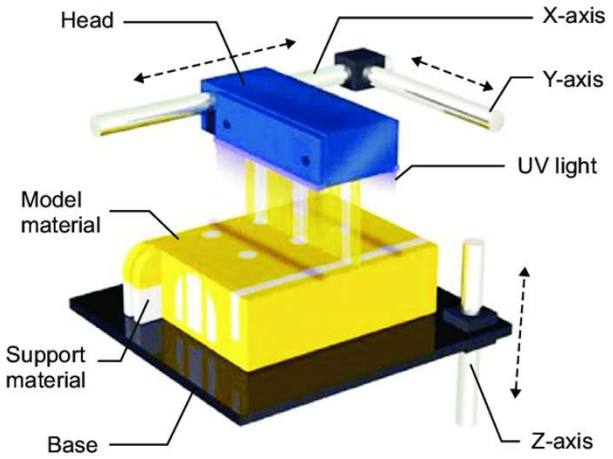
2.7/ Electron Beam Melting (EBM)





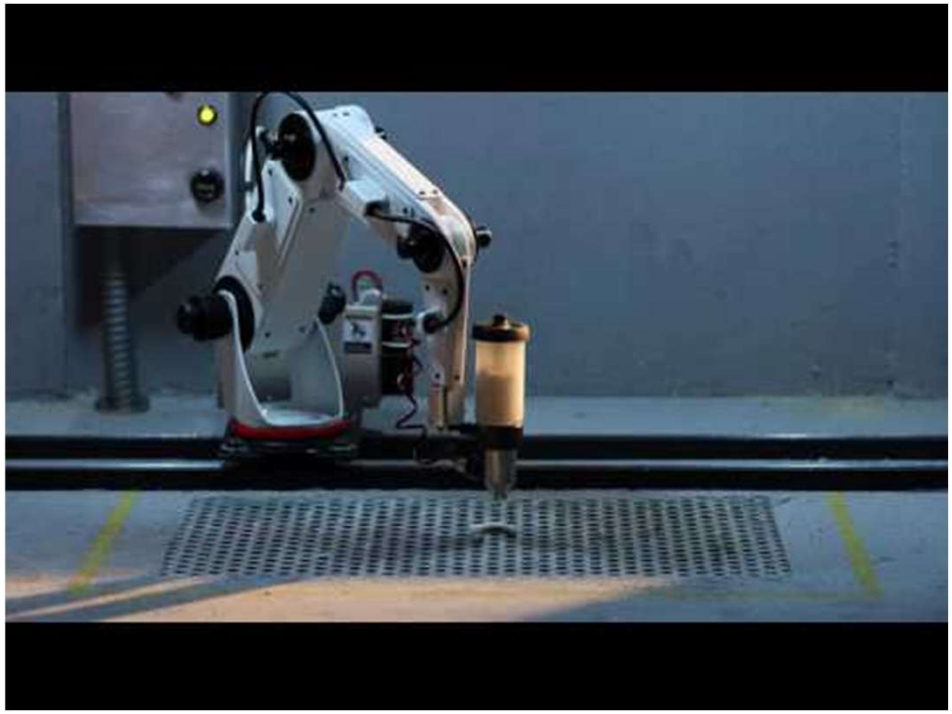
2.7/ Electron Beam Melting (EBM)





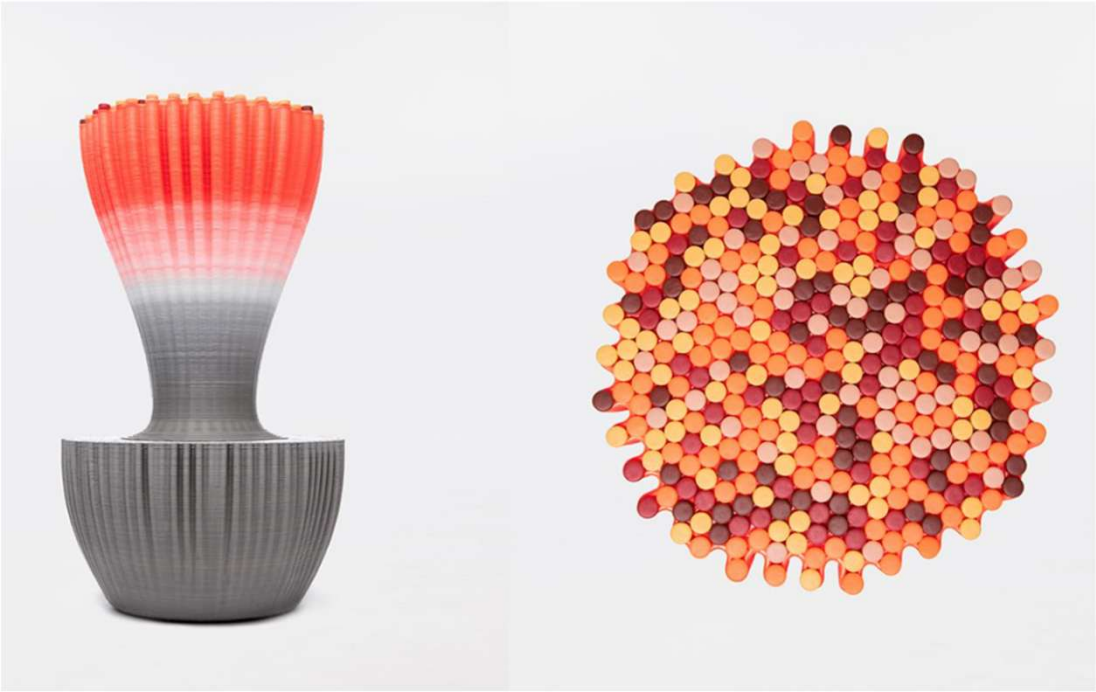
Chubby chair - Dirk Van Der Kooji

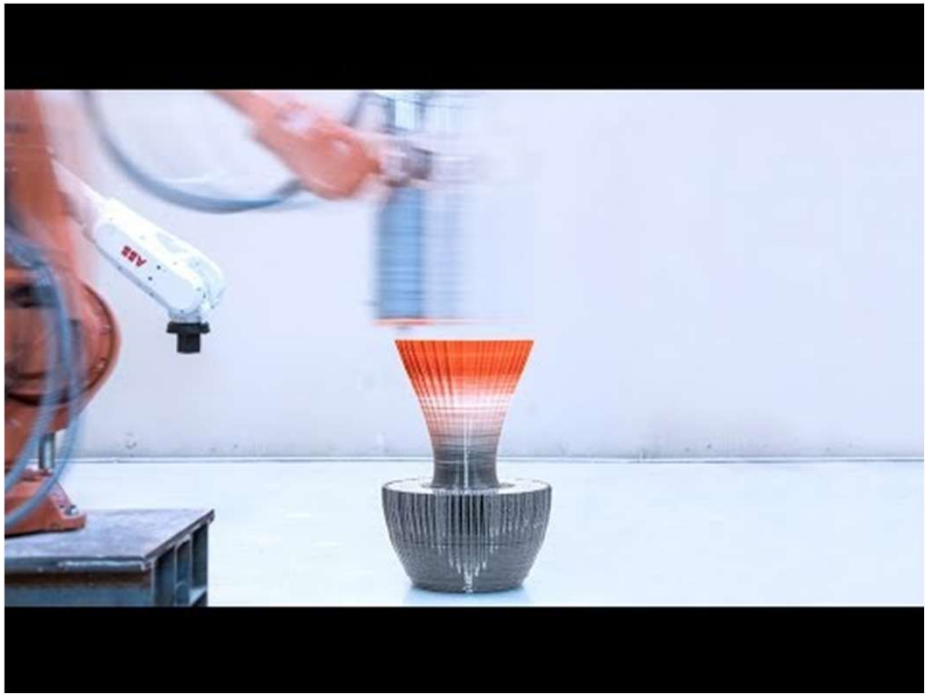




https://dirkvanderkooij.com/chubby

Nagami_Robotica by Ross Lovegrove





https://nagami.design/en/product/robotica/

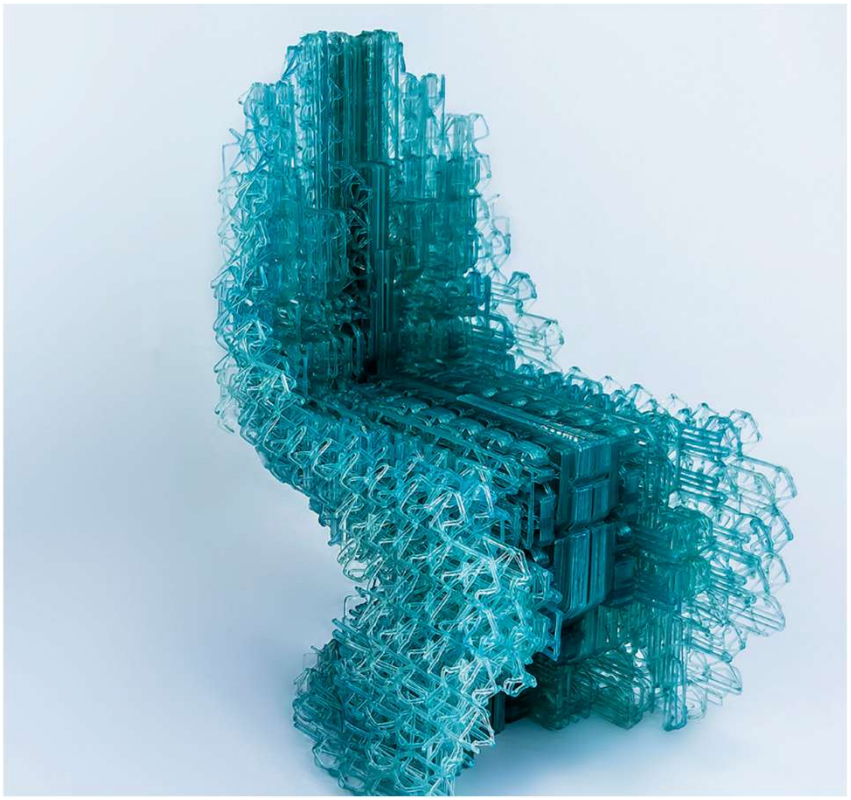
Nagami_Rise by Zaha Hadid Architects

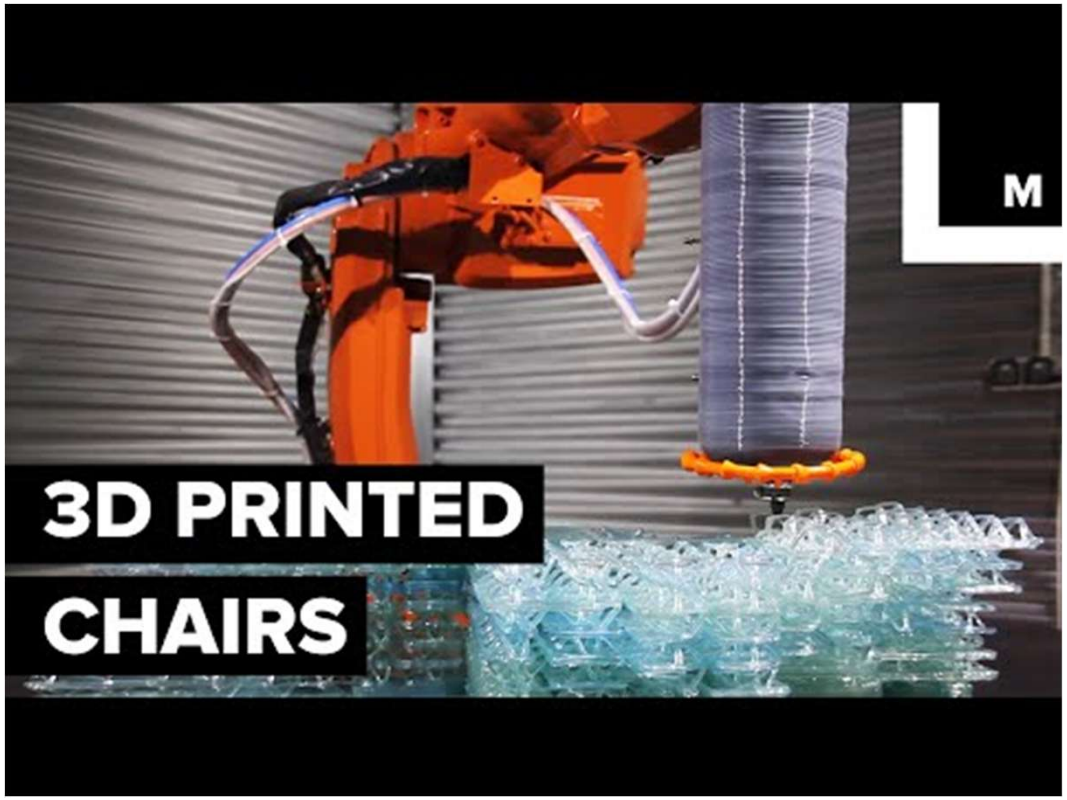




https://nagami.design/en/product/rise/

Nagami_Voxelchair by Manuel Jiménez García and Gilles Retsin





https://nagami.design/en/project/voxelchair-v1-0/

Biomimicry chair by Lilian Van Daal





https://www.lilianvandaal.com/biomimicry-3d-printed-soft-seat

U.S.E. by Giulia Del Grande, R3direct





https://www.designboom.com/design/r3direct-giulia-del-grande-u-s-e-urban-safety-everyday-street-furniture-lucca-03-29-2022/
http://www.r3direct.it/u-s-e-urban-safety-everyday-2022/

Lamaquina by Noumena





https://www.instagram.com/lamaquina_3d/

Lamaquina by Noumena - Pure Plants









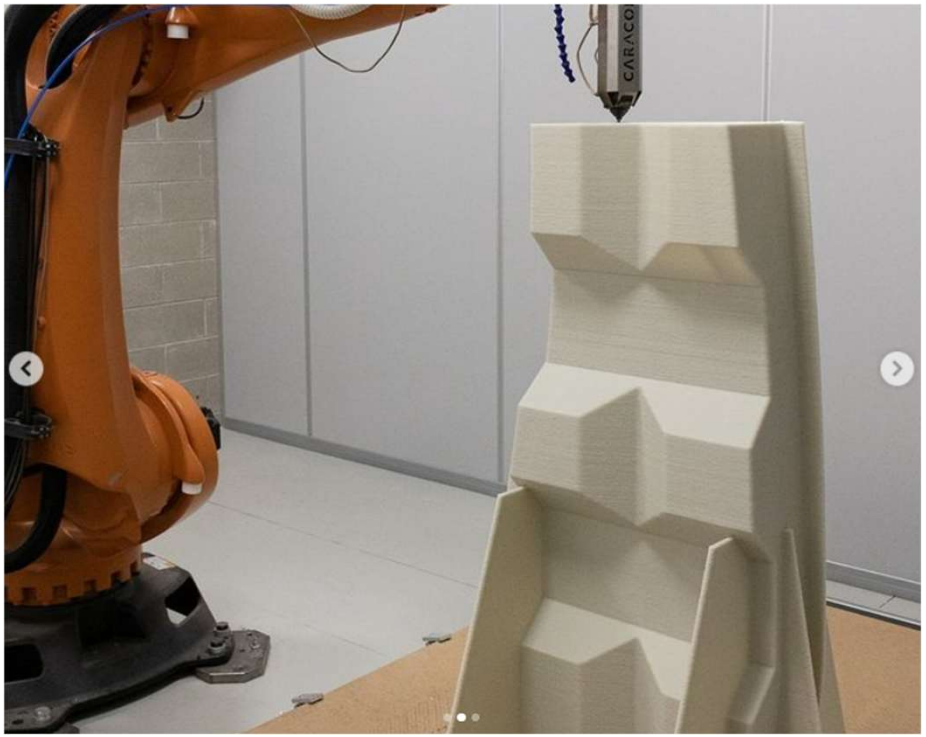
https://www.instagram.com/lamaquina_3d/

Lamaquina by Noumena - Concept Store



https://www.instagram.com/lamaquina_3d/

Caracol AM





https://www.instagram.com/caracol_am/

Caracol AM



https://www.instagram.com/caracol_am/

2.8/ Fuori Concorso



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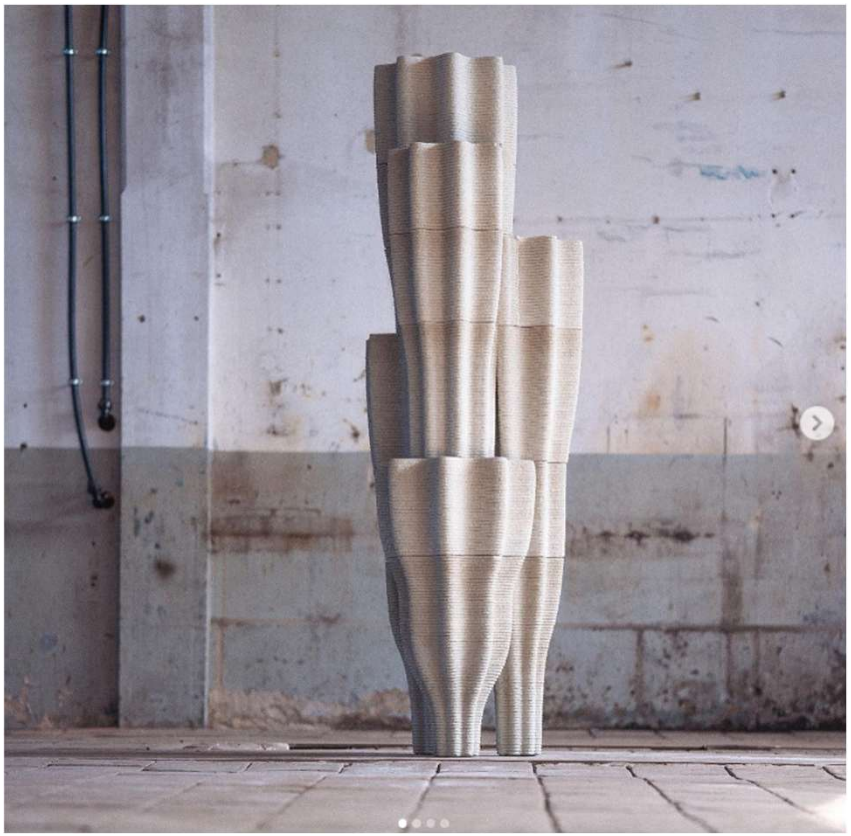
Vertico - Netherlands

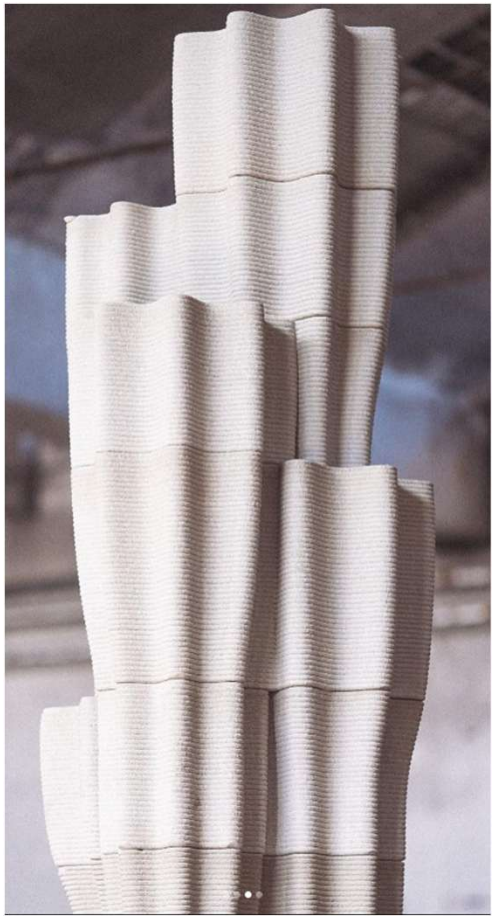


https://www.instagram.com/vertico_3d/

Vertico - Netherlands







https://www.instagram.com/vertico_3d/

2.8/ Fuori Concorso





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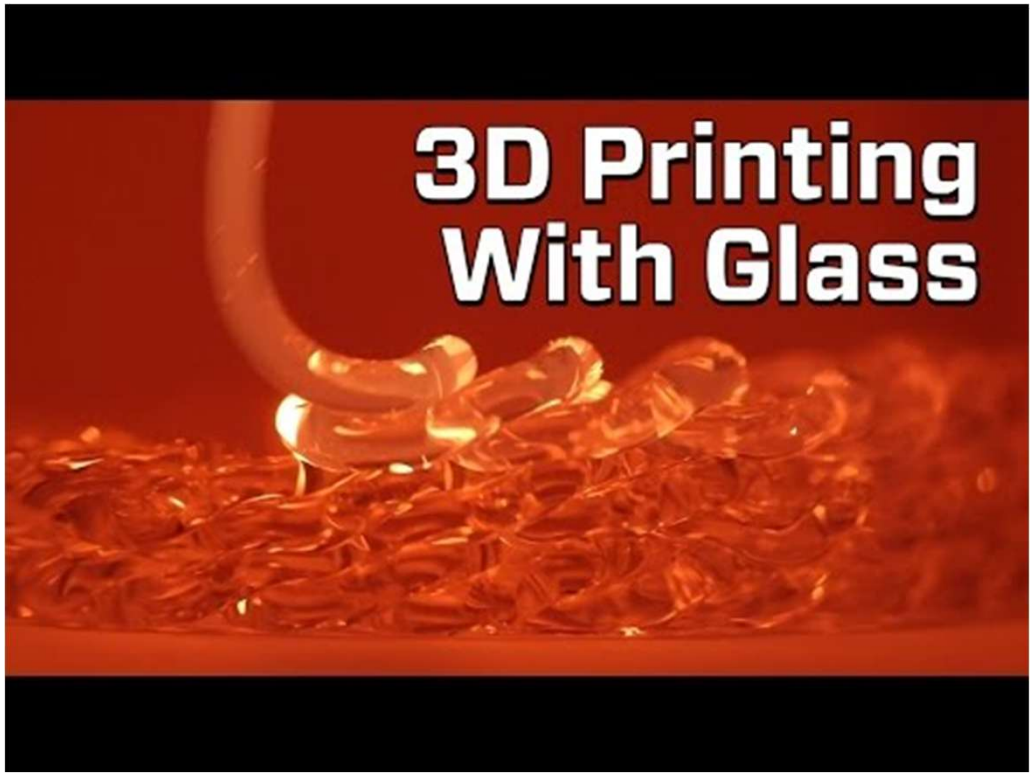
2.8/ Fuori Concorso





ISIA // *Processi di produzione e advanced manifacturing*// **Seminario //** Stampa 3d, 4d, tecniche manifattura additiva, design algoritmico // **Relatore //** Lorenzo Masini //

2.8/ Fuori Concorso





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2.8/ Fuori Concorso



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3/Robotics

3/Braccio Robotico

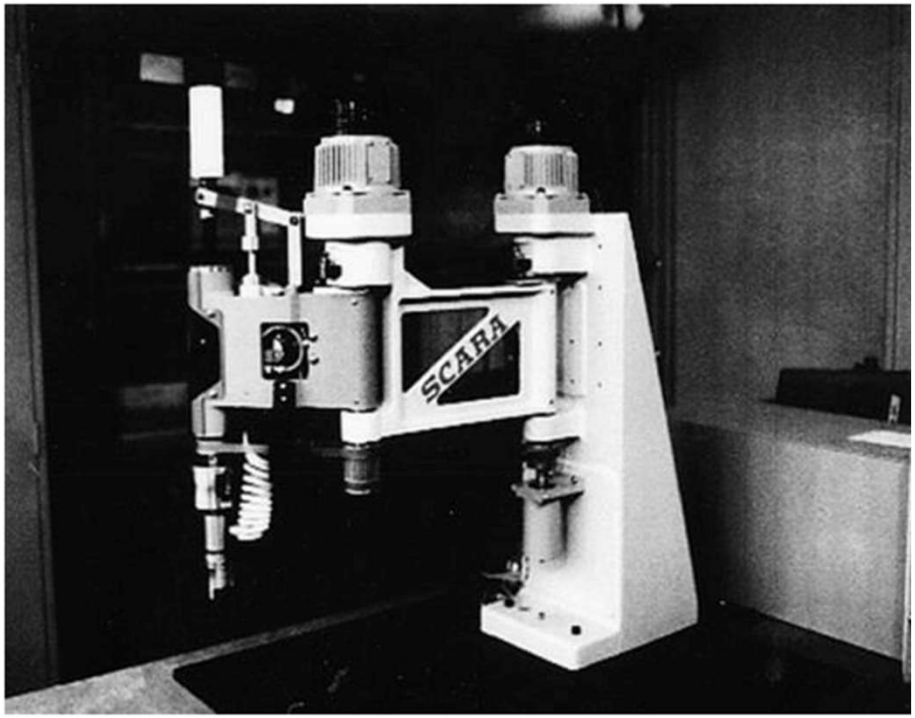
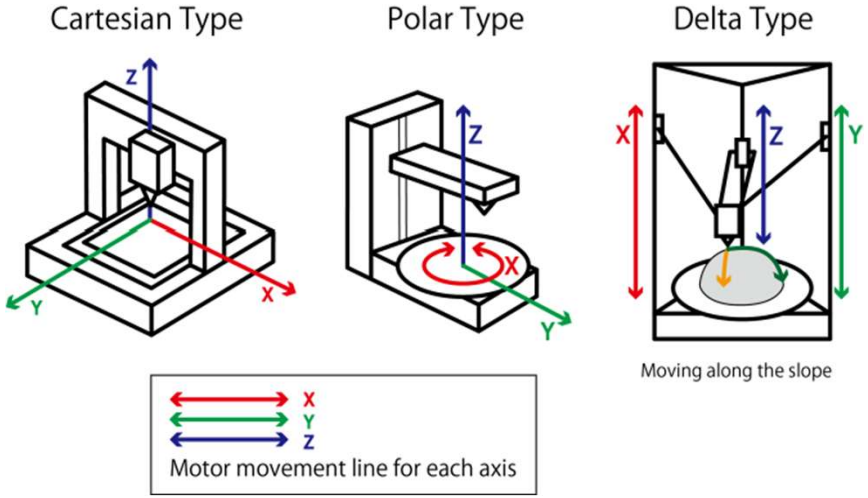
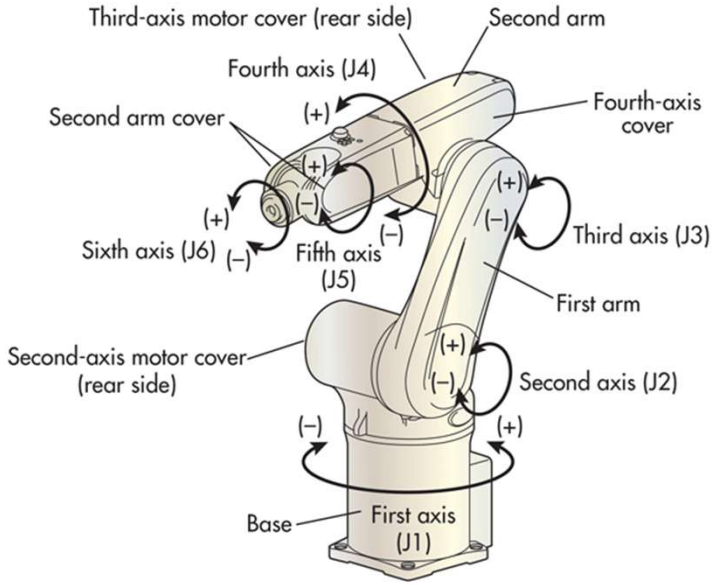


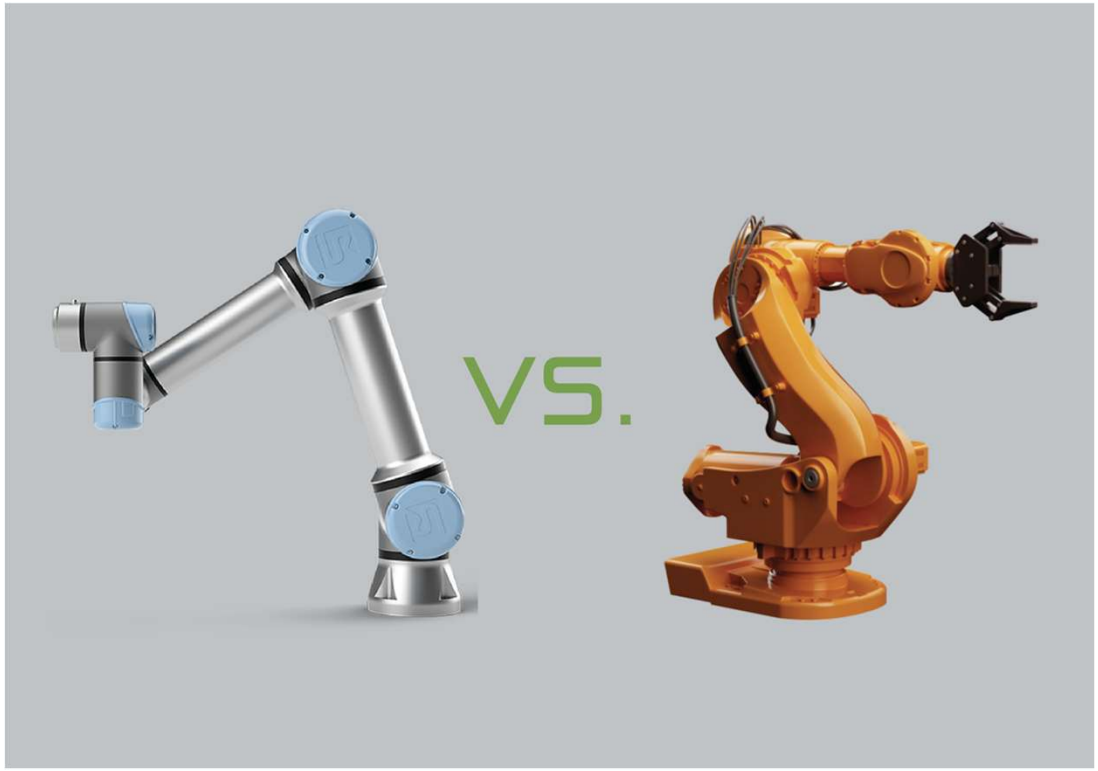
Fig. 1 The first SCARA robot by Hiroshi Makino [1]

3.1/Meccanica delle braccia robotiche

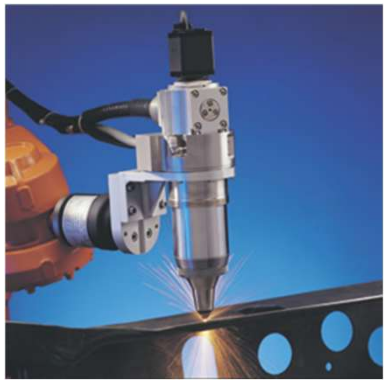




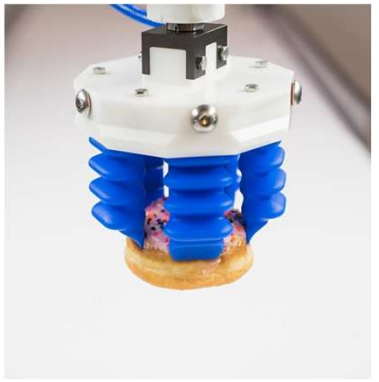
3.2/Tipologie di braccio robotico

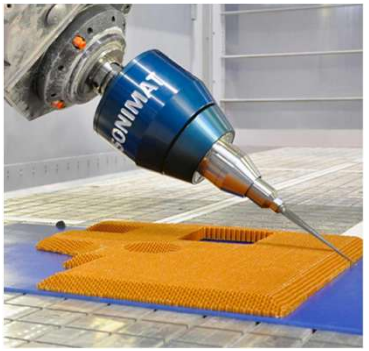


3.3/End Effector













4.1/Incremental Sheet Forming





4.2/Terraperforma





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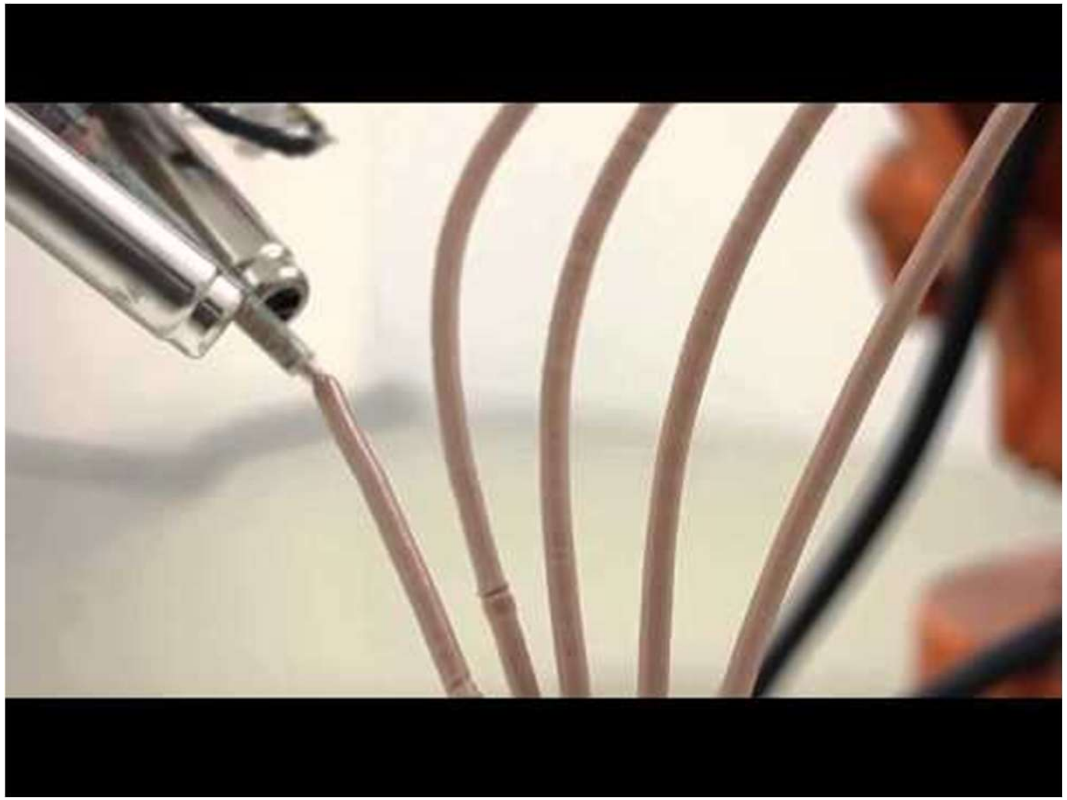
4.3/Mataerial





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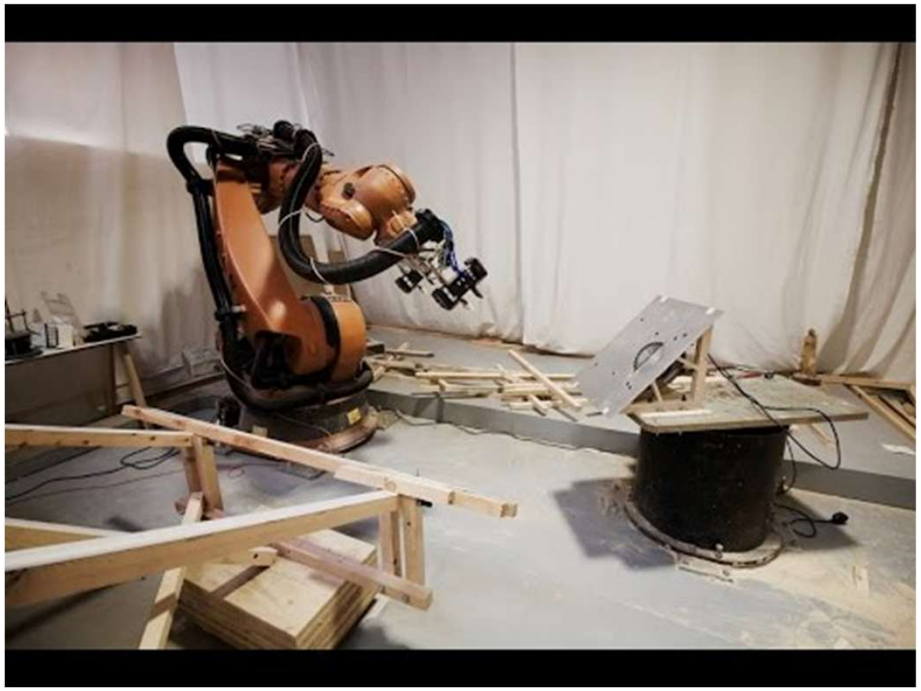
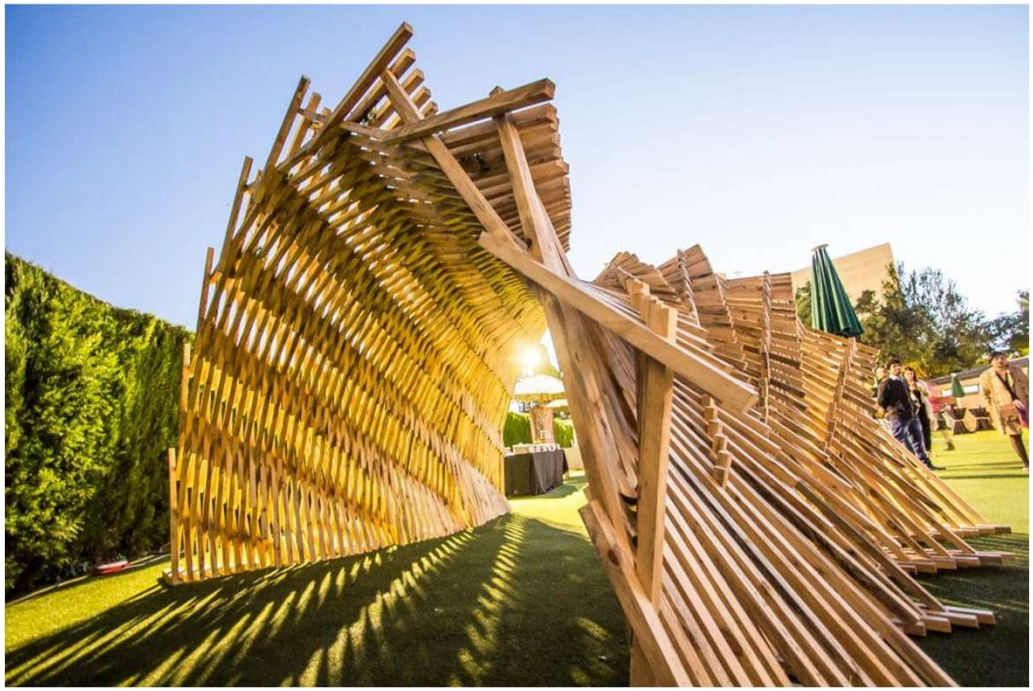
4.4/Fusta Robotica





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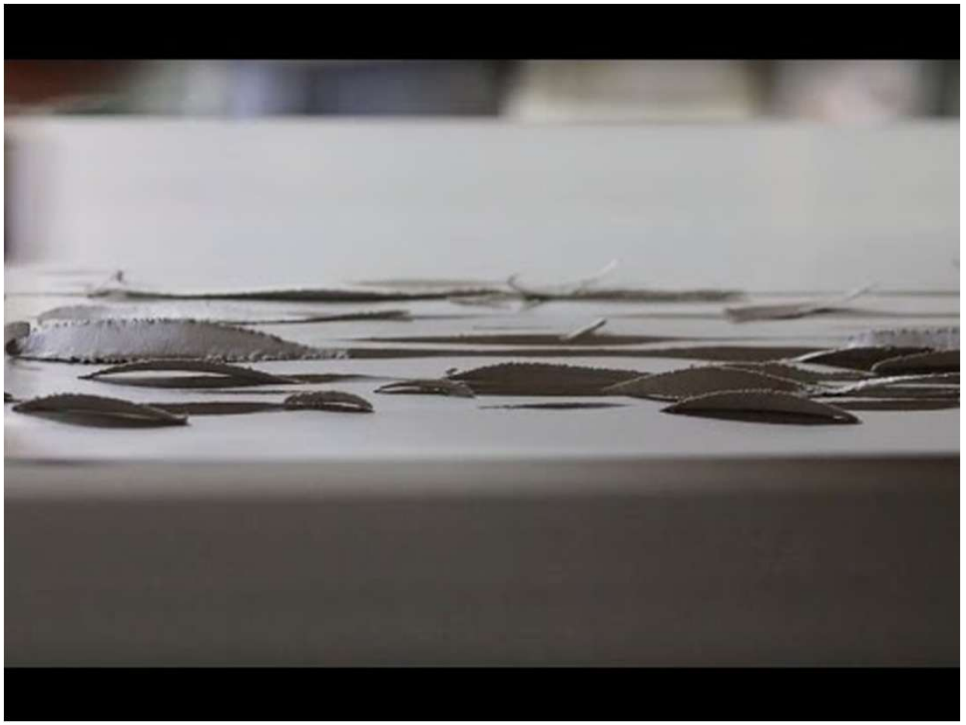
4.5/Musical Robotic Facade





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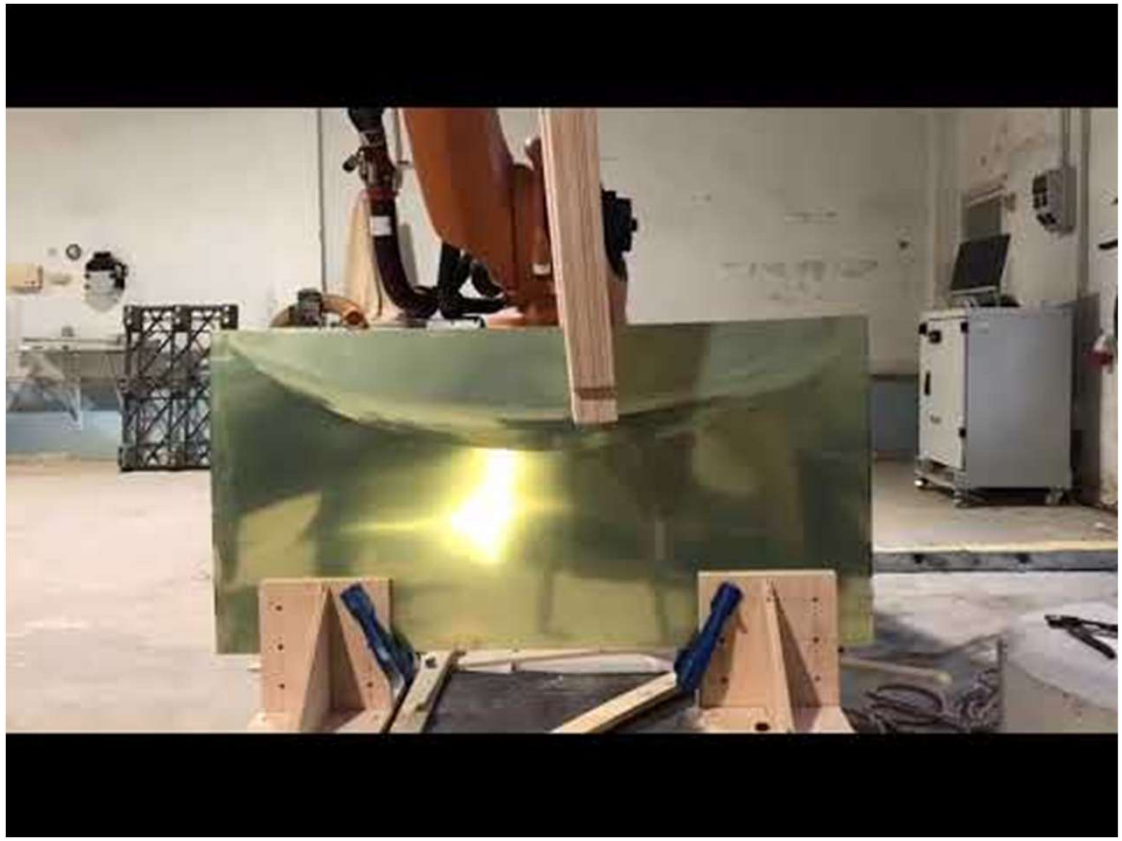
4.6/Metal Carving





ISIA // *Processi di produzione e advanced manifacturing*// **Seminario //** Stampa 3d, 4d, tecniche manifattura additiva, design algoritmico // **Relatore //** Lorenzo Masini //



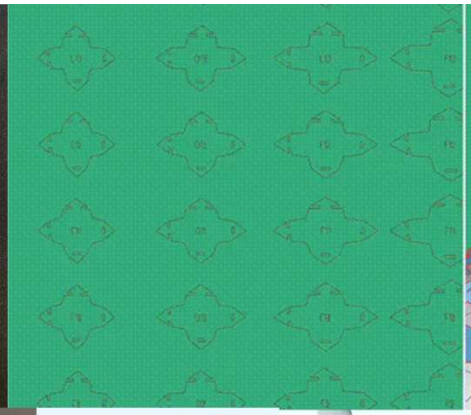
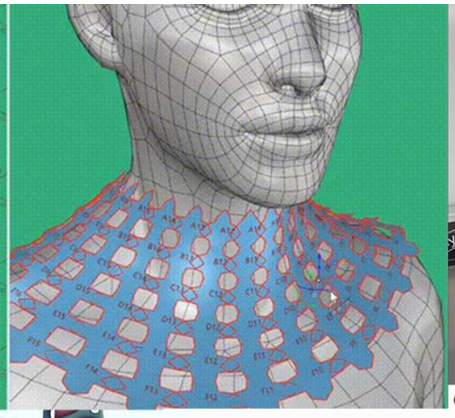
ISIA // *Progressi di produzione* **Seminario //** *Manufacturing* **Seminario //** Stampa 3D, Aggiungere la Massa Customizzativa **Relatore //** Lorenzo Masini //

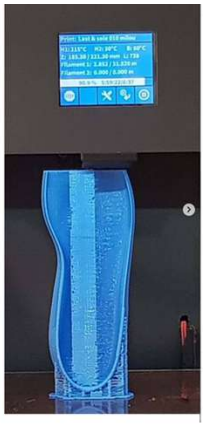
4/Supermateria

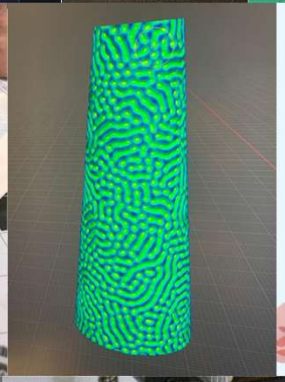


ISIA // *Processi di produzione e advanced manifacturing*// **Seminario //** Stampa 3d, 4d, tecniche manifattura additiva, design algoritmico // **Relatore //** Lorenzo Masini //

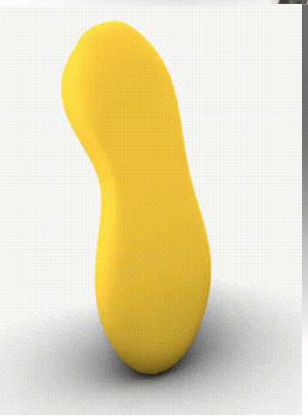


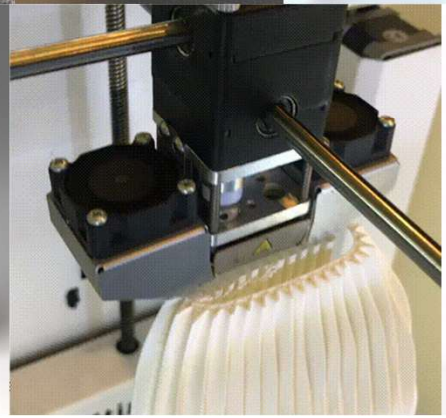




footwearists




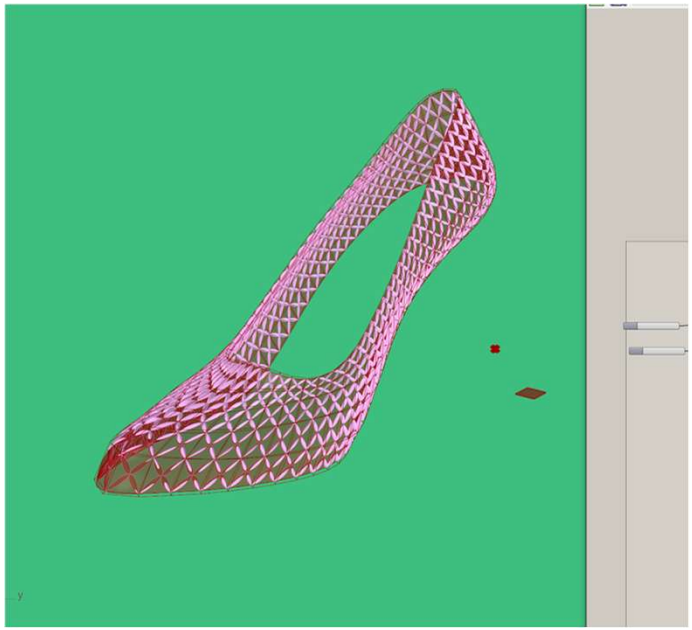








_ Footwear research in late 2023

Bridging Algorithm, AI and 3D





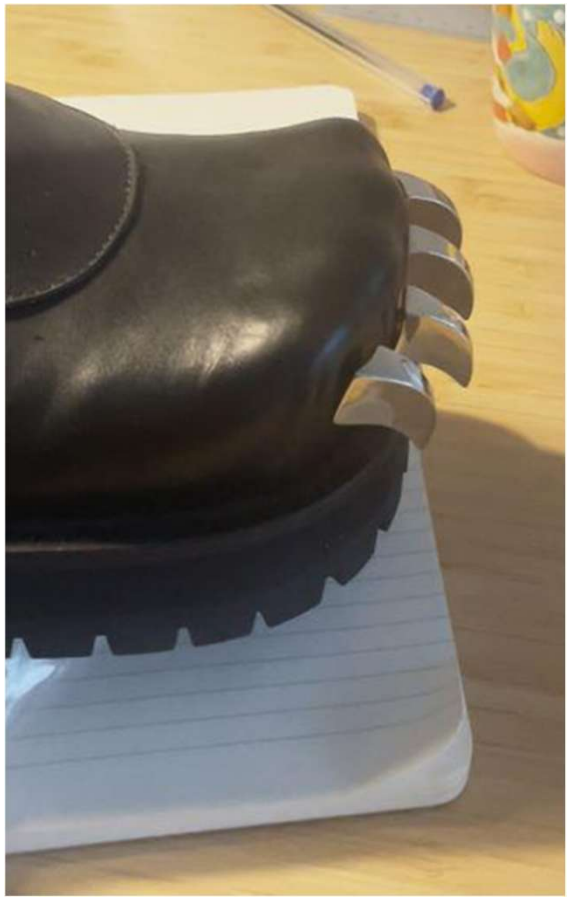


ISIA // *Processi di produzione e advanced manifacturing*// **Seminario //** Stampa 3d, 4d, tecniche manifattura additiva, design algoritmico // **Relatore //** Lorenzo Masini //

_ Product development for small batches

Production of functional parts with MJF





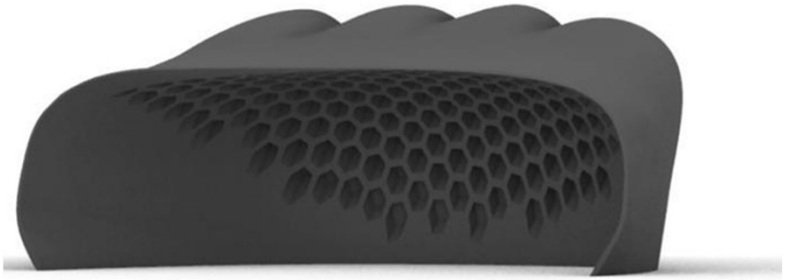
ISIA // *Processi di produzione e advanced manifacturing*// **Seminario //** Stampa 3d, 4d, tecniche manifattura additiva, design algoritmico // **Relatore //** Lorenzo Masini //

_ Product development for small batches

Production of functional parts with MJF









_ Product development for large batches

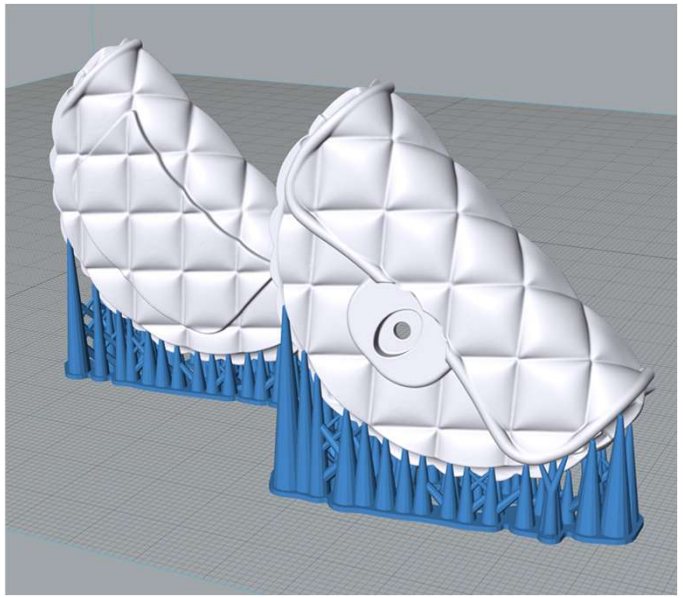
Production of functional parts with SLA

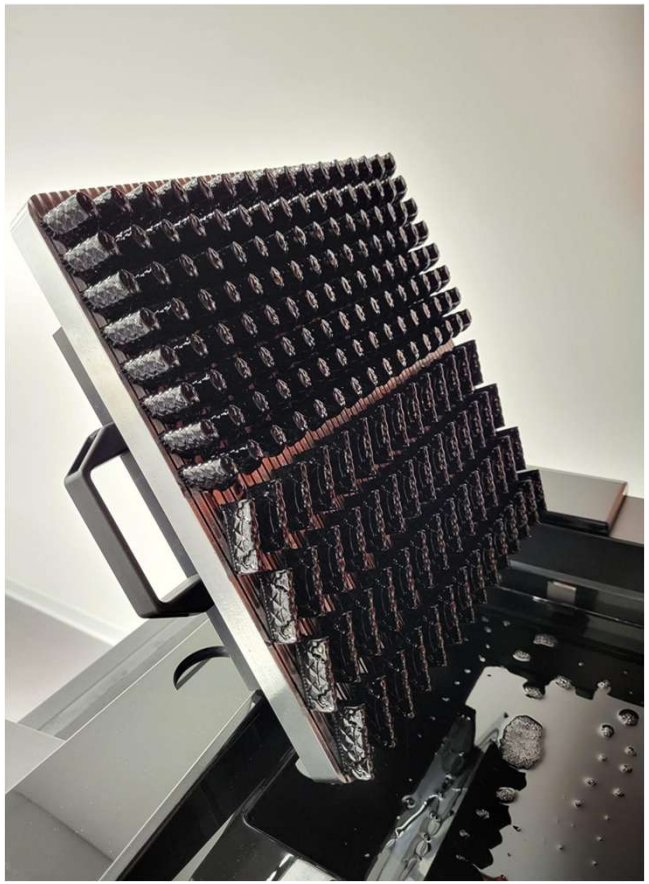


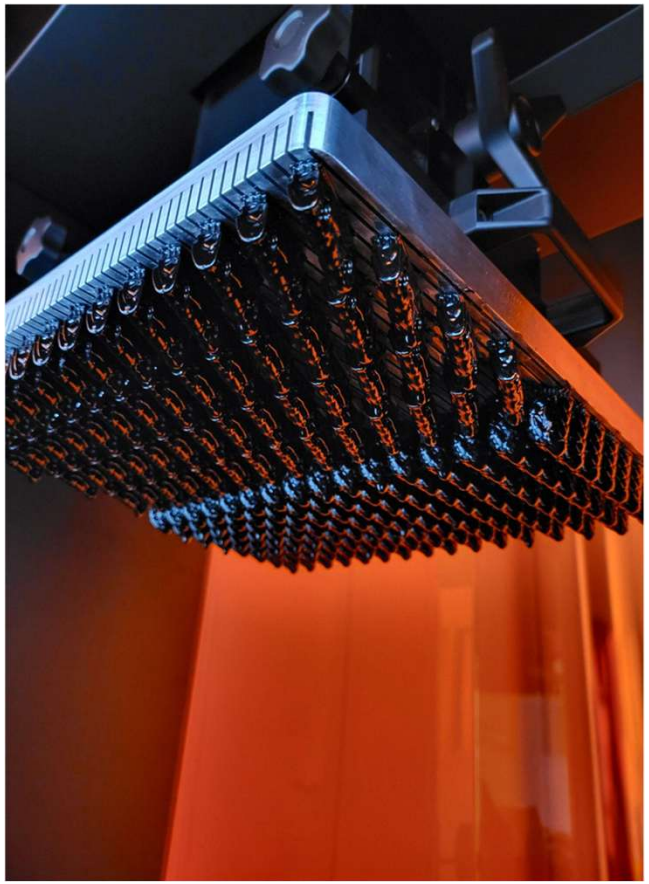


_ Product development for large batches

Production of functional parts with SLA

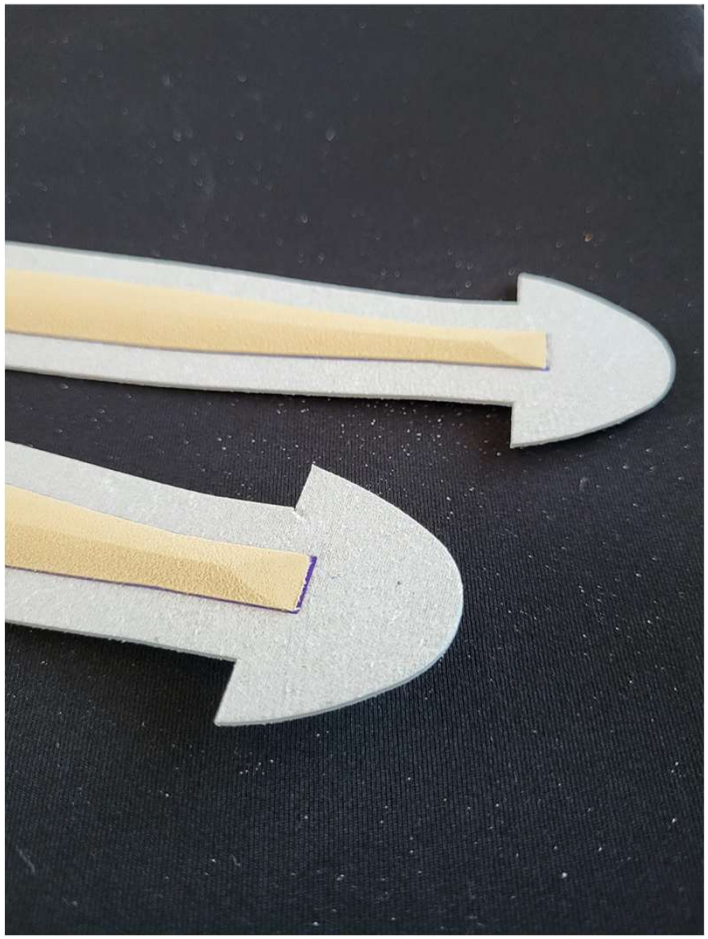






_ Parts replacement

Production of functional parts with MJF





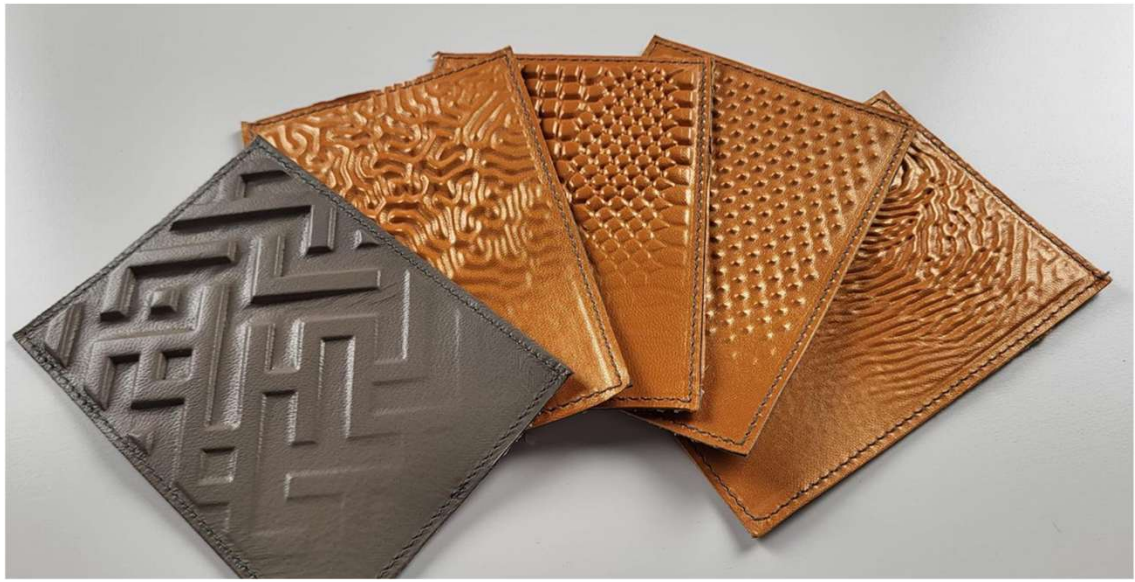


_ Parts replacement

Production of functional parts with MJF



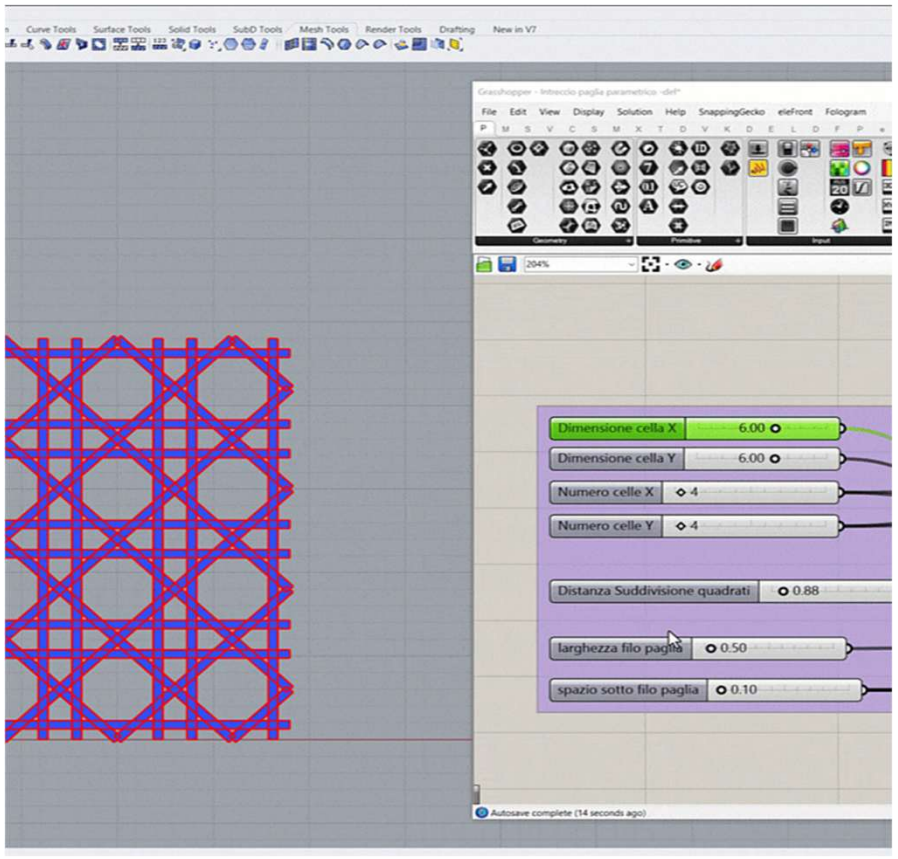


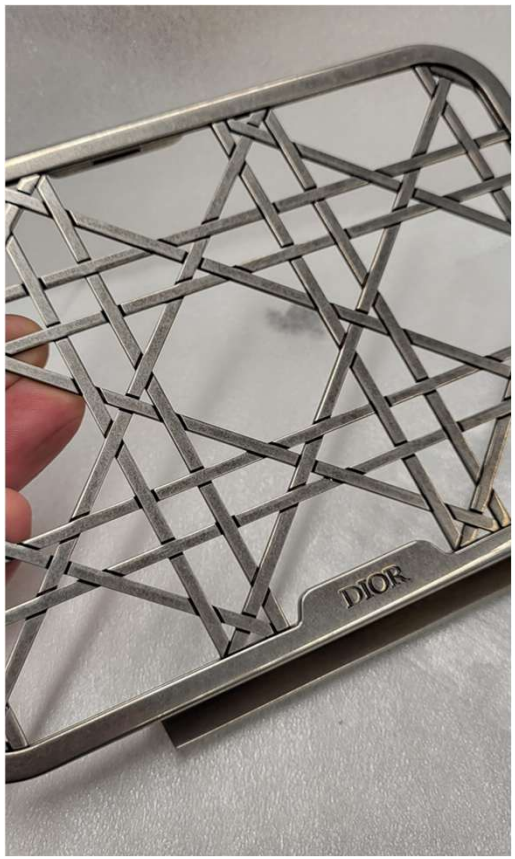


_ Configure to manufacturing

Speed manufacturing to produce for fashion industry.





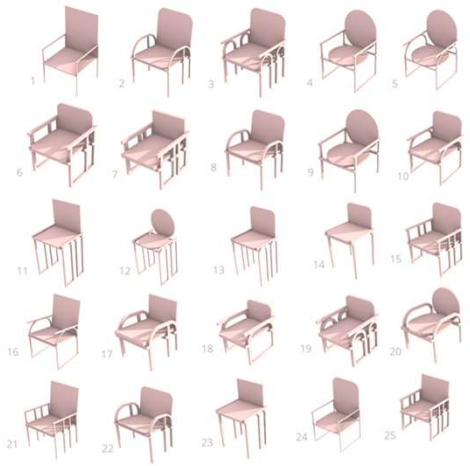


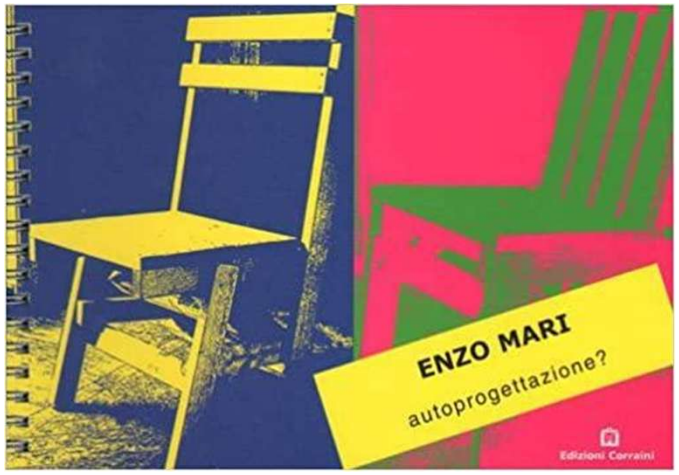
Courtesy of Dior

ISIA // *Processi di produzione e advanced manifacturing*// **Seminario //** Stampa 3d, 4d, tecniche manifattura additiva, design algoritmico // **Relatore //** Lorenzo Masini //

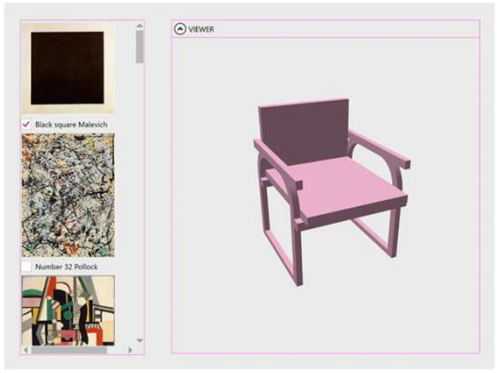
_ Parametric AI driven model

3D parametric models based on “Autoprogettazione?” by Enzo Mari to create generative families of seating.













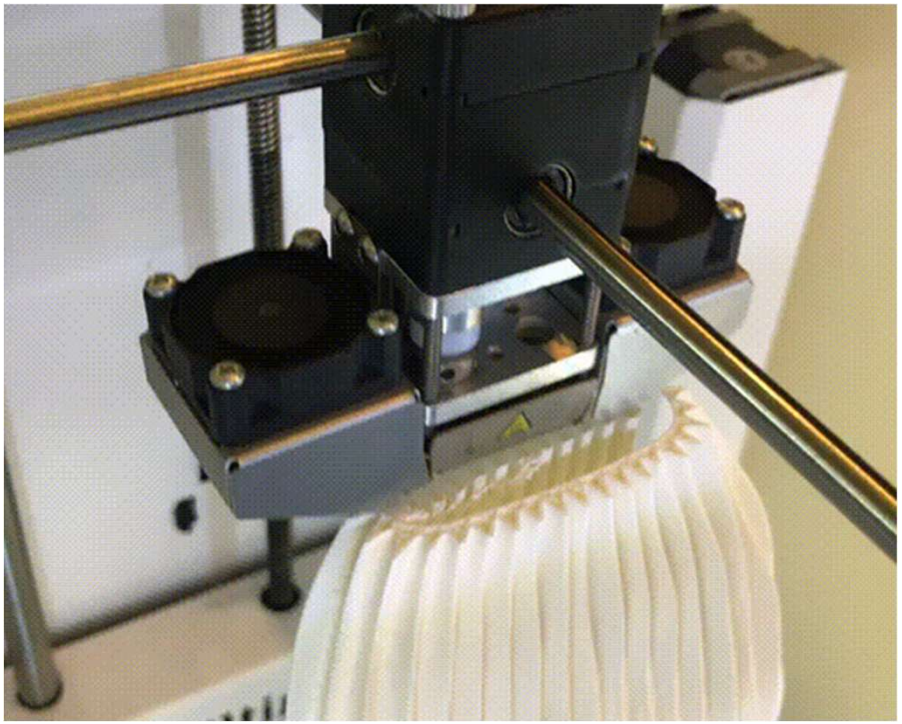


_ 3D print to mass-customization

3D printed slipper with variable design, in which every object is a variation of the same algorithm, creating a series of unique pieces.







Courtesy of Footwearology - Barcellona

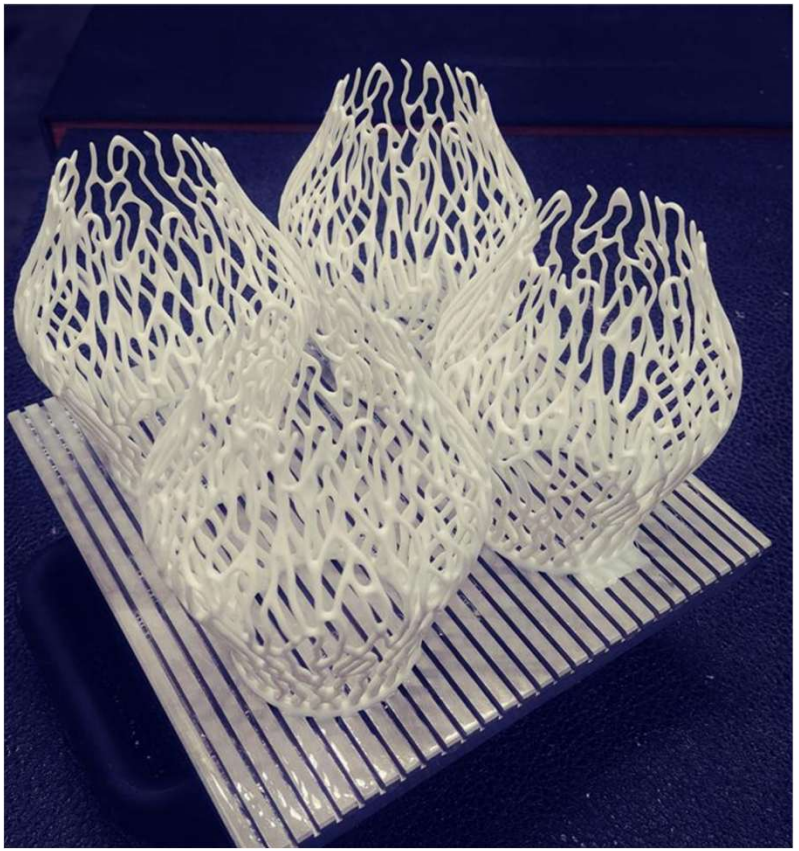
_ Flexible Design application

Algorithm development project of a customisable fashion accessory, developing a parametric pattern that adjust itself to the final shape





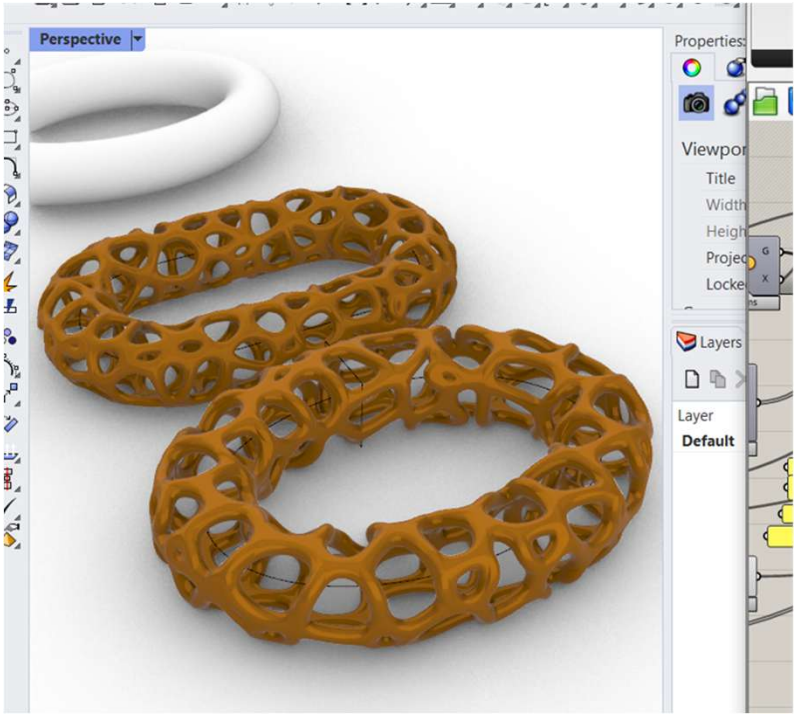


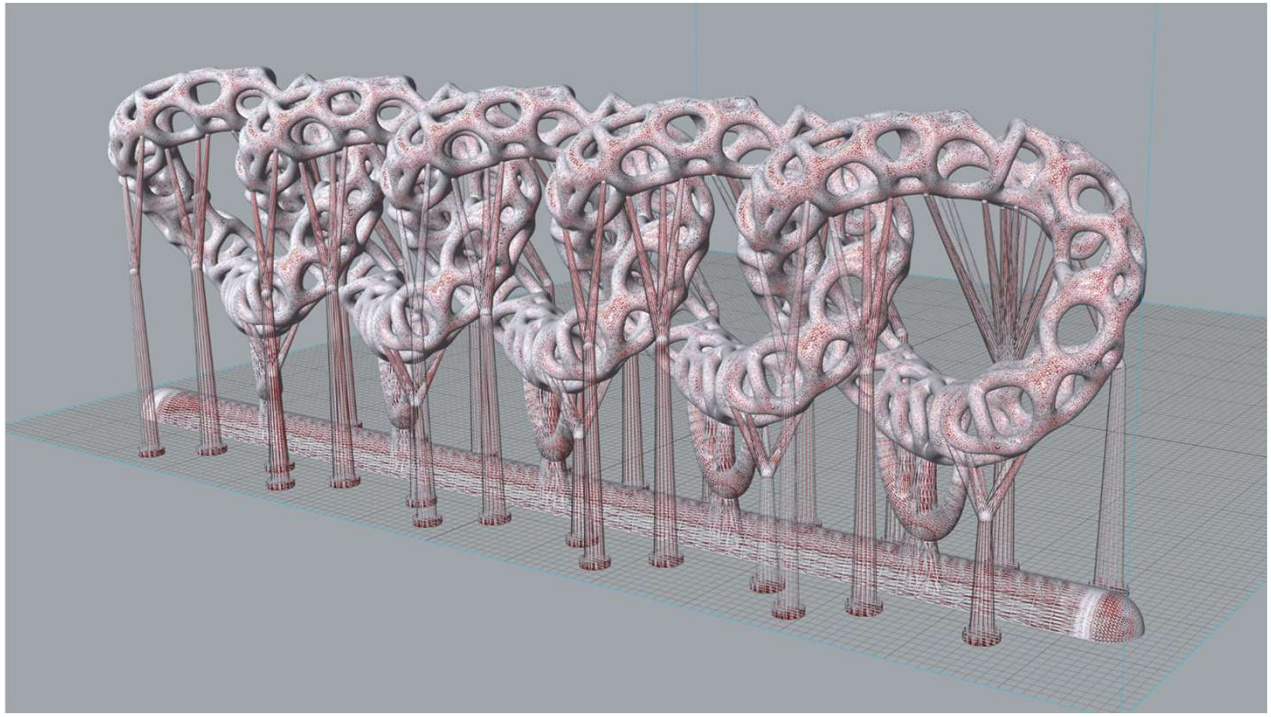


ISIA // *Processi di produzione e advanced manifacturing*// **Seminario //** Stampa 3d, 4d, tecniche manifattura additiva, design algoritmico // **Relatore //** Lorenzo Masini //

_ Casting impossible

Generate complex geometries considering casting problems





_ Casting impossible

Generate complex geometries considering casting problems



ISIA // *Processi di produzione e advanced manifacturing*// **Seminario //** Stampa 3d, 4d, tecniche manifattura additiva, design algoritmico // **Relatore //** Lorenzo Masini //

_ Parametric texturing

3D printing for mold-making, an application to design seamless garment with mycelium bio-based leather.



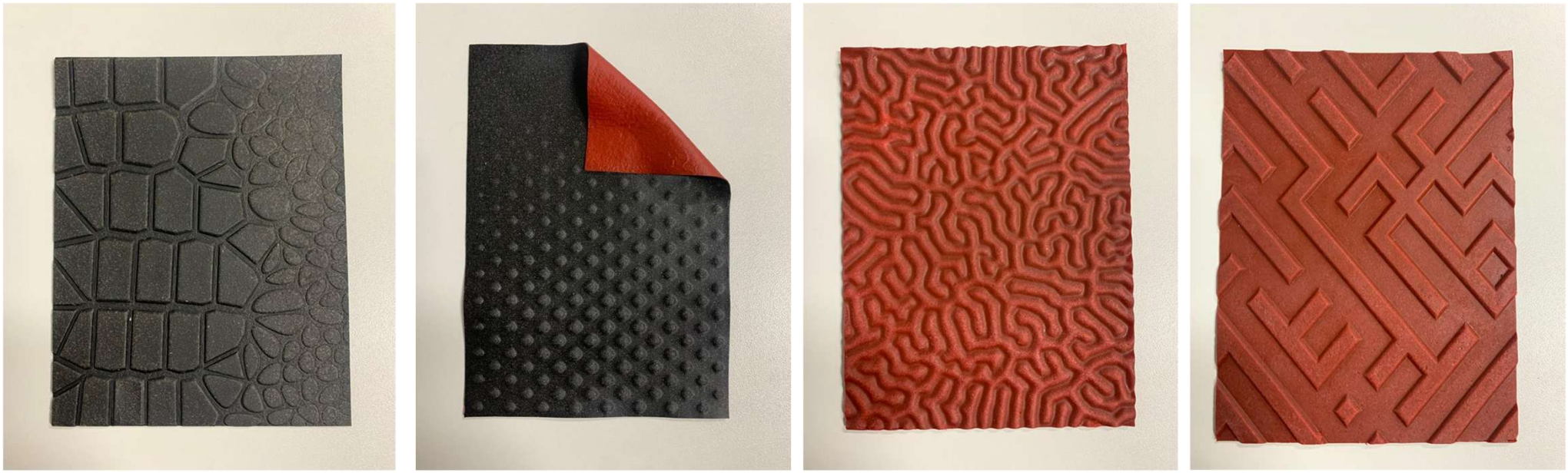




Courtesy of Mycotext - Amersfort, NL

_ Parametric texturing

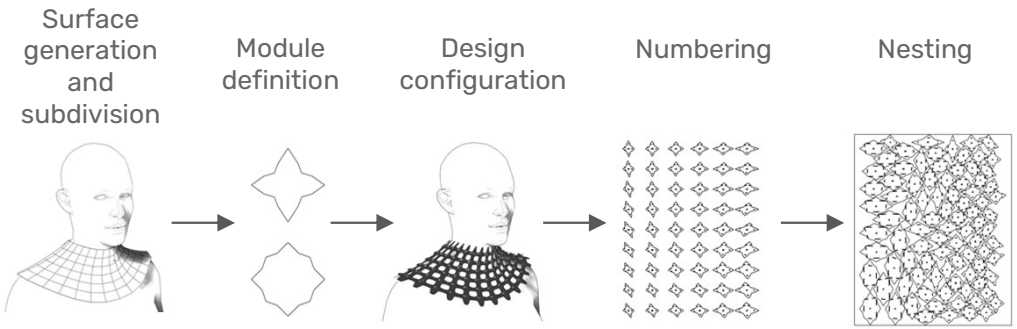
3D printing for mold-making, an application to design seamless garment with mycelium bio-based leather.

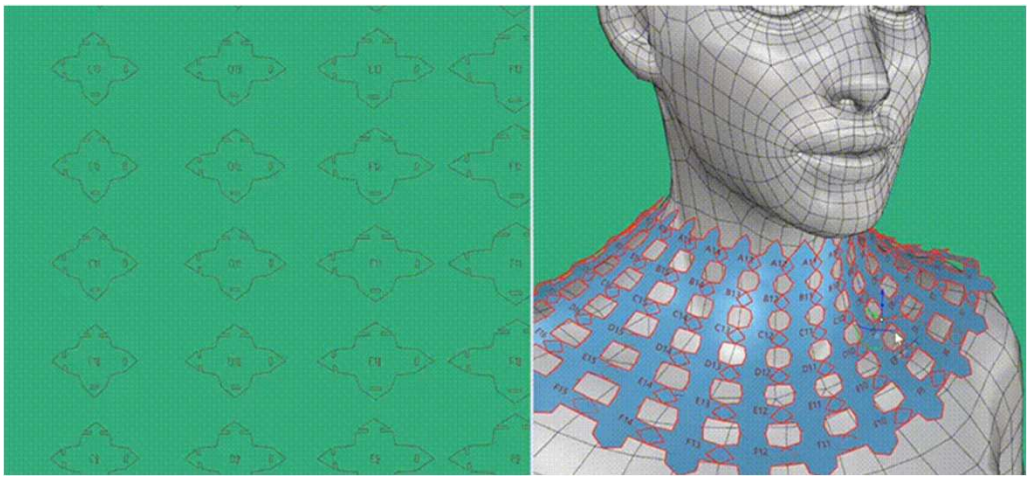


Courtesy of Mycotext - Amersfort, NL

_ Design Tessellation

Algorithm development project of a customisable fashion accessory, starting from the scanning of the human body to the final fabrication.









Courtesy of HvA- Amsterdam, Loes Bogers

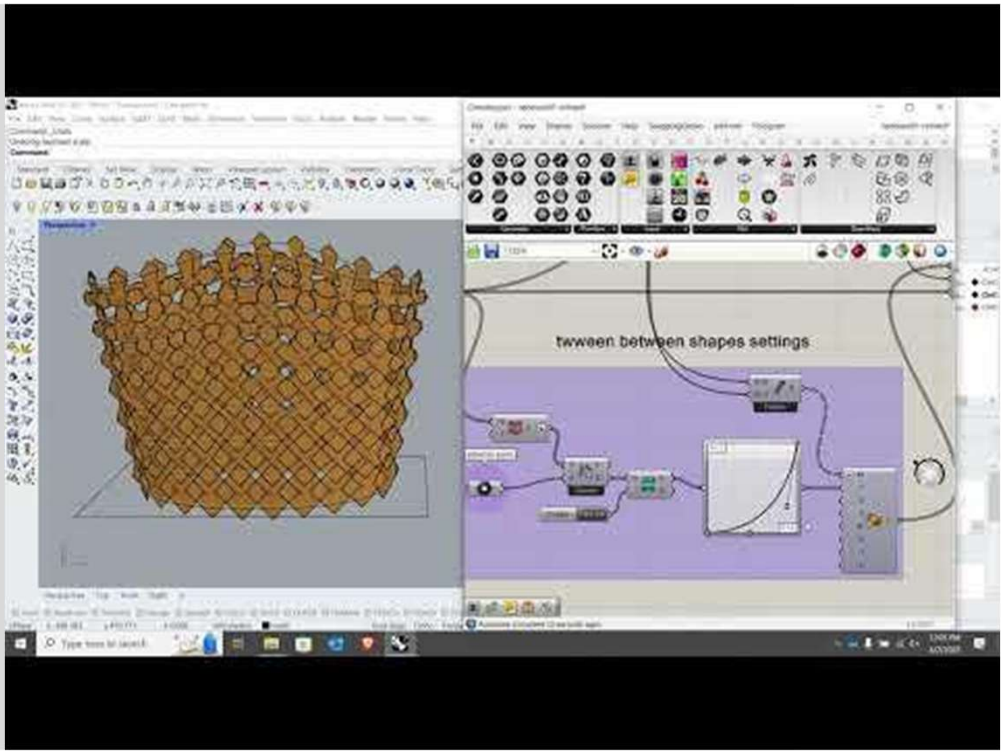
_ Design Tessellation

Algorithm development project of a customisable fashion accessory, starting from the scanning of the human body to the final fabrication.





Gradient between the two shapes: the same ruff worn back and front.



ISIA // *Processi di produzione e advanced manifacturing*// **Seminario //** Stampa 3d, 4d, tecniche manifattura additiva, design algoritmico // **Relatore //** Lorenzo Masini //

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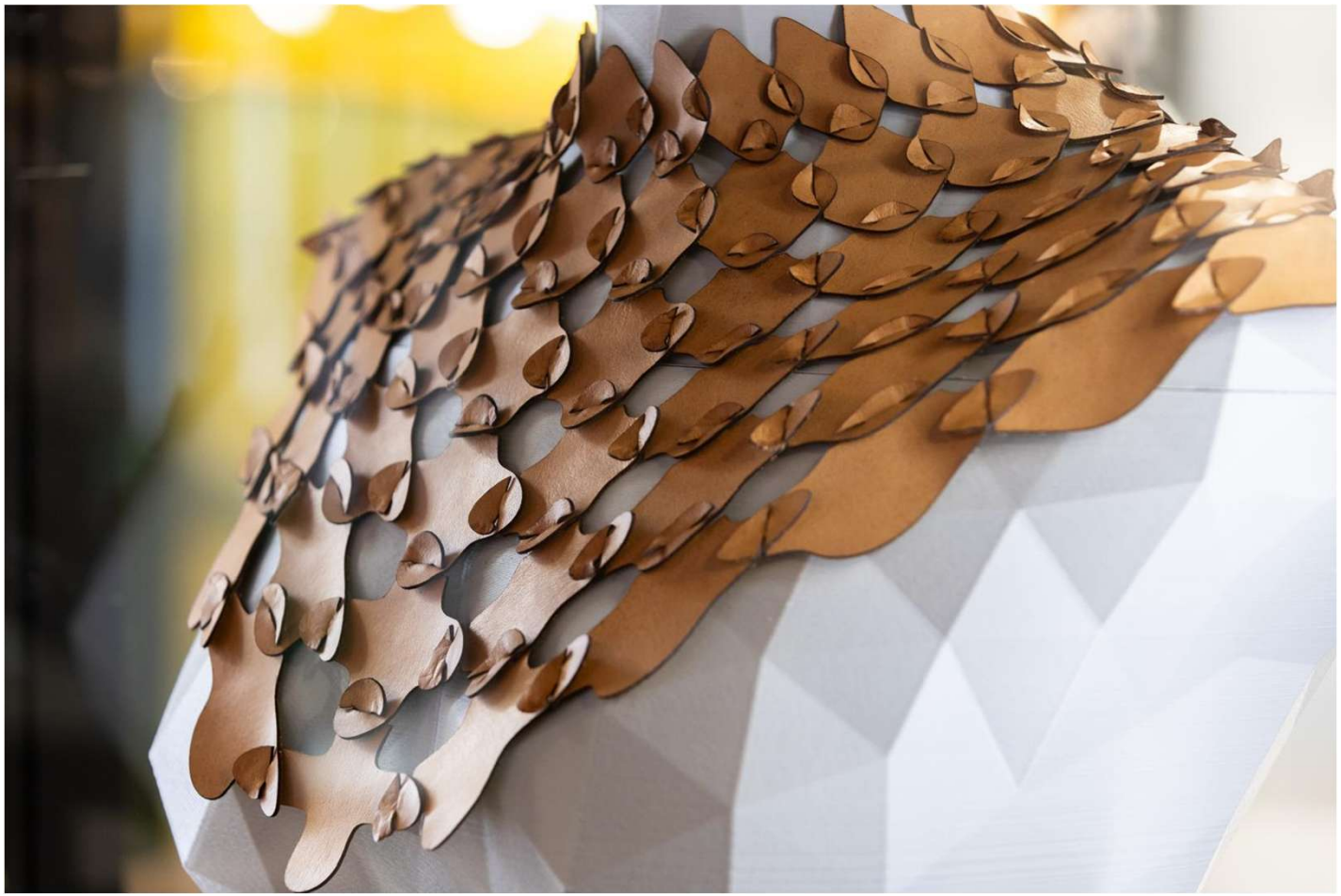


ISIA // *Processi di produzione e advanced manifacturing*// **Seminario //** Stampa 3d, 4d, tecniche manifattura additiva, design algoritmico // **Relatore //** Lorenzo Masini //

_ Design for Additive

example of a 3D printed heel developed and printed with a carbon-absorbent material, developed for Noumena.



Courtesy of Noumena- Barcelona

_ Design for Additive

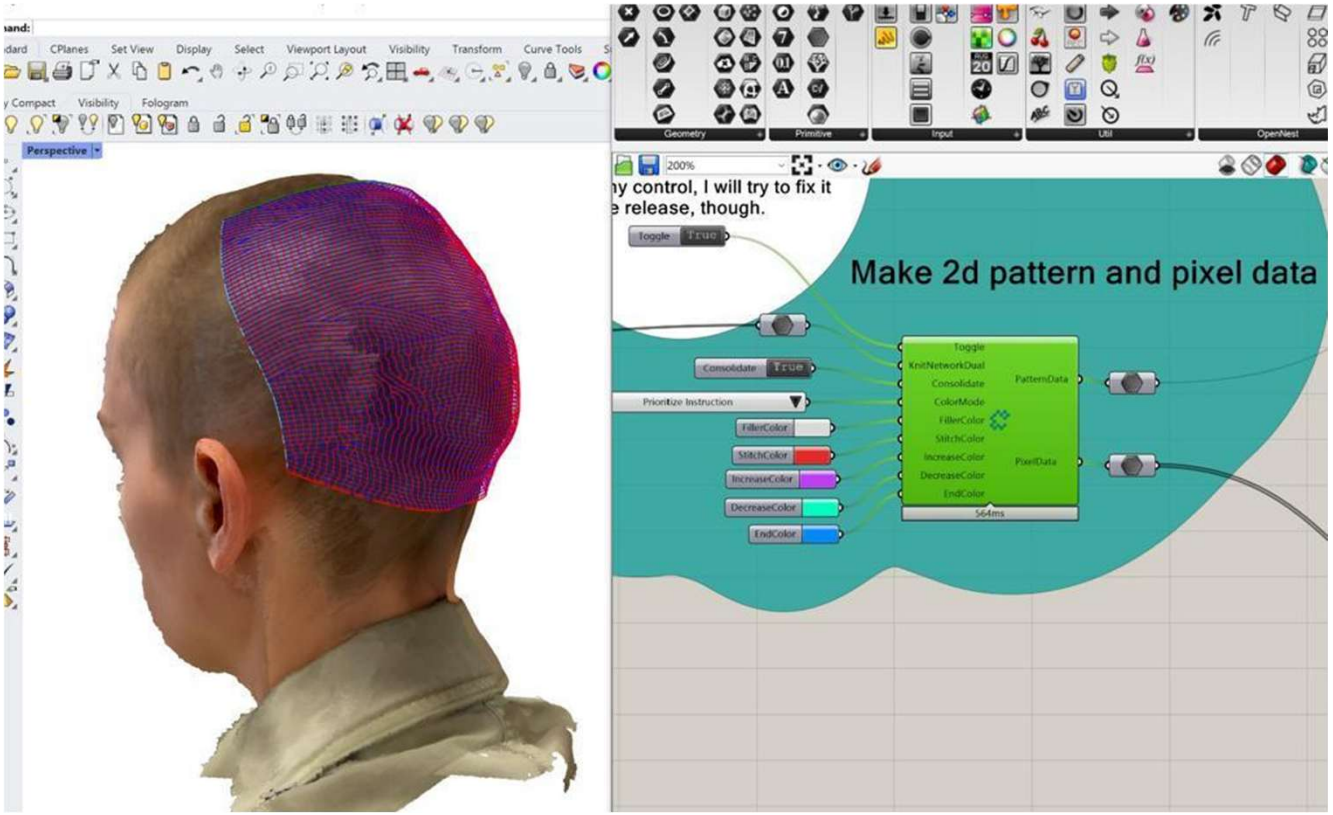
example of a 3D printed heel developed and printed with a carbon-absorbent material, developed for Noumena.



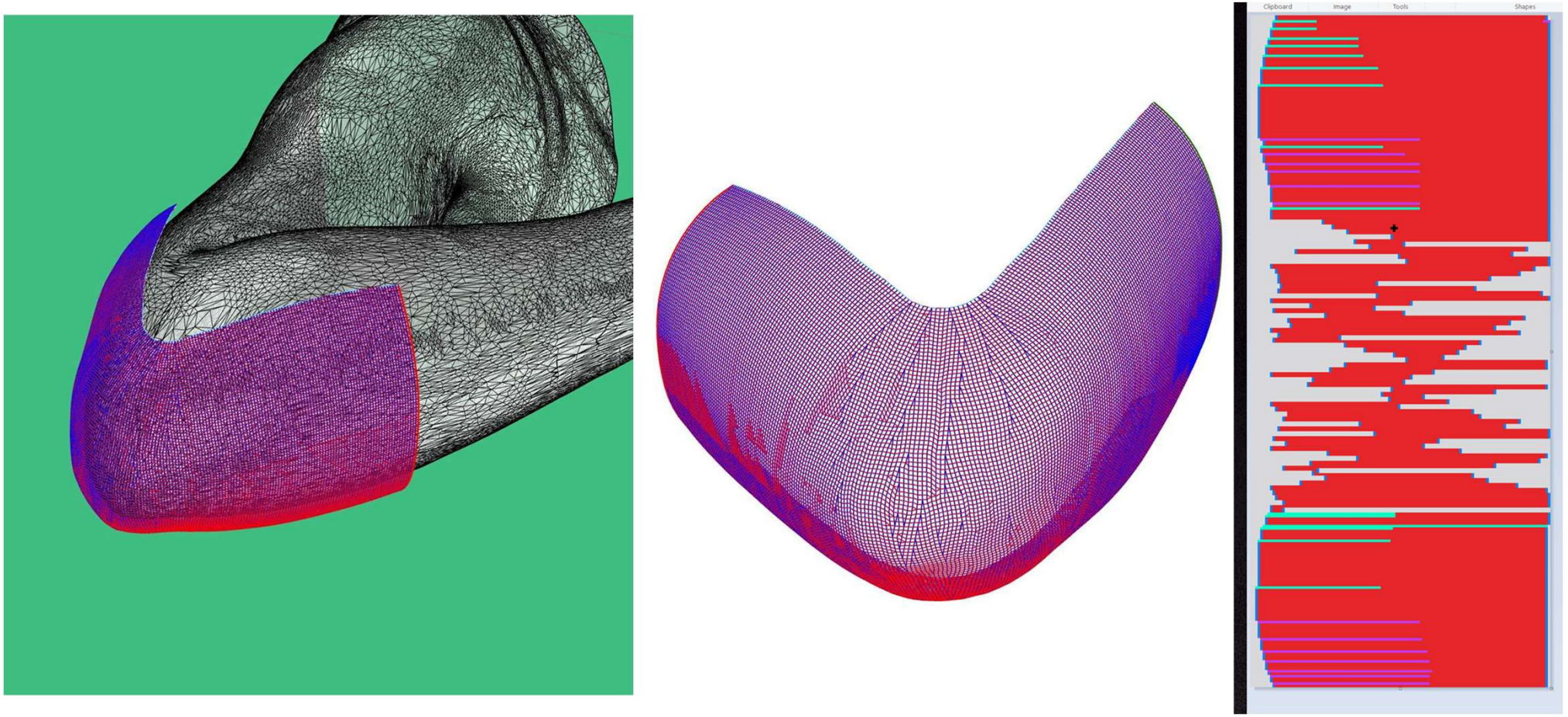



Courtesy of Noumena- Barcelona





3D knitting: Bridging 3d data from body scanner to knit custom made outfit



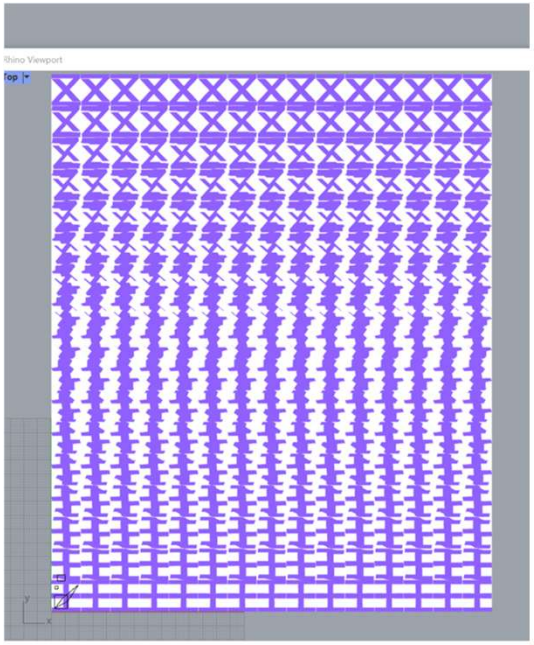
IMG_ Example of an 3D elbow and his transaction in knitting instruction (Pixel map).c



IMG_ Knitted sample of the elbow that replicate the topology.

_ Keep it local

Generated pattern for knitting









_ Drape measuring and Tensile testing

Bridging physical and digital samples

