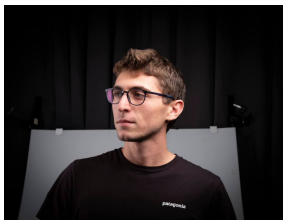
Matteo Bulla’s Thesis on Digital Shoe Design



Matteo Bulla’s thesis project, showcased at Performance Days 2024 in Munich, de

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As an industrial designer with a background from Politecnico di Milano, Bulla's expertise lies in merging creative innovation with technical precision, particularly through 3D modeling and visualization using Rhinoceros.

IDEATION & DESIGN PHASE

The project’s inception revolved around the digitization of the entire footwear design process. Starting with the creation of a digital last, Bulla utilized Rhinoceros to develop intricate 3D models of the shoe’s sole and upper. Rhinoceros’ surface-based modeling capabilities allowed for detailed and flexible design work, accommodating both the technical and aesthetic aspects of the project.

PRODUCTION INSIGHTS & TECHNOLOGICAL TOOLS

During the production phase, the incorporation of various digital fabrication techniques played a crucial role. Bulla explored Fused Granulate Fabrication (FGF) for the soles, using TPE-S 59A pellets to achieve optimal cushioning and flexibility.

The design featured a unique pattern of interlocking K-shaped and triangular concave forms, enhancing both functionality and visual appeal. Rhinoceros facilitated the complex modeling required,

particularly with tools like Sweep2 and Crv2View for generating 3D curves and surfaces from 2D outlines.

For the shoe upper, Bulla collaborated with Sneaknit, leveraging their expertise in 3D knitting to create a structure that connected with the 3D-printed sole. The 3D printing was carried out in collaboration with Direct3DPellet Extrusion, highlighting the potential of combining different digital fabrication techniques to achieve a cohesive final product.

OVERCOMING CHALLENGES

One of the significant challenges faced during the project was ensuring the sustainability of the design. Traditional methods using adhesives compromised recyclability and ease of disassembly. Bulla addressed this by devising a glueless assembly system, where 3D knitted canals and 3D printed shapes were secured with laces wrapping around the shoe. This innovative approach not only enhanced the sustainability of the design but also maintained structural integrity.

See Also

SUBD IN RHINO 7 & 8

STRATEGIC COLLABORATIONS

The project’s success was bolstered by collaborations with various experts and companies. Key contributors included Rucky Zambrano for design insights, Professor Riccardo Gatti, and Andrea Rondoni and Valentino Parlato from Arsutoria, a school for shoe and bag design, who provided invaluable support in their respective domains.

FINAL PROTOTYPE & REFINEMENTS

The final prototype, meticulously refined to align with ergonomic principles, showcased a dynamic interplay between the sole and upper. The sole’s design was optimized for urban settings, providing cushioning, stability, and flexibility through various phases of walking. The upper’s construction, involving a tie rod and buckle mechanism, ensured a secure and comfortable fit without the need for adhesives.

Matteo Bulla’s thesis project exemplifies the potential of digital tools in revolutionizing footwear design – blending creativity with technical precision to create innovative, sustainable products.