A New Design Experience For 3D Printed Footwear

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Overview

This project was conducted to explore and affirm the relationships between the Mechanical property of Adidas' 3D printed mid-soles and the emotive responses of consumers who would wear these shoes. The relationships confirmed through this capstone will help designers and engineers at Adidas design footwear that meets consumer demands.

Problem statement

How might we take the natural language used by consumers and athletes to talk about desired footwear function and interpret this into an engineered product?

Research

Both HCDE and ME team researched on different aspects of this problem and connected users feedbacks and mechanical properties

HCDE

We started with a simple question: What would engineers want on Adidas team?

1. Interview Adidas team

We conducted 6 interviews with Adidas engineering team

User needs

More certain about the **association** between pucks properties and consumers feedbacks

More **in-depth** understanding and **transparent** understanding of pucks

A proper **filter** and **sorting** system of users feedbacks

2. Interview users

We interviewed **30+** consumers

How would you define wearing experience?

3. Consolidate natural language keywords

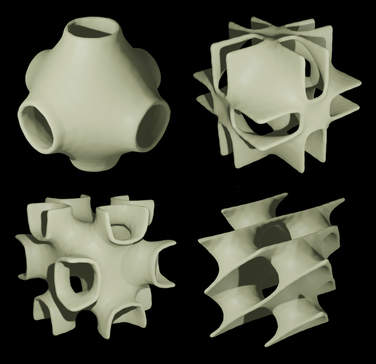
Confident Relaxed Excited **Sporty** **Stylish**

We used **5** main natual language keywords into our touch testing

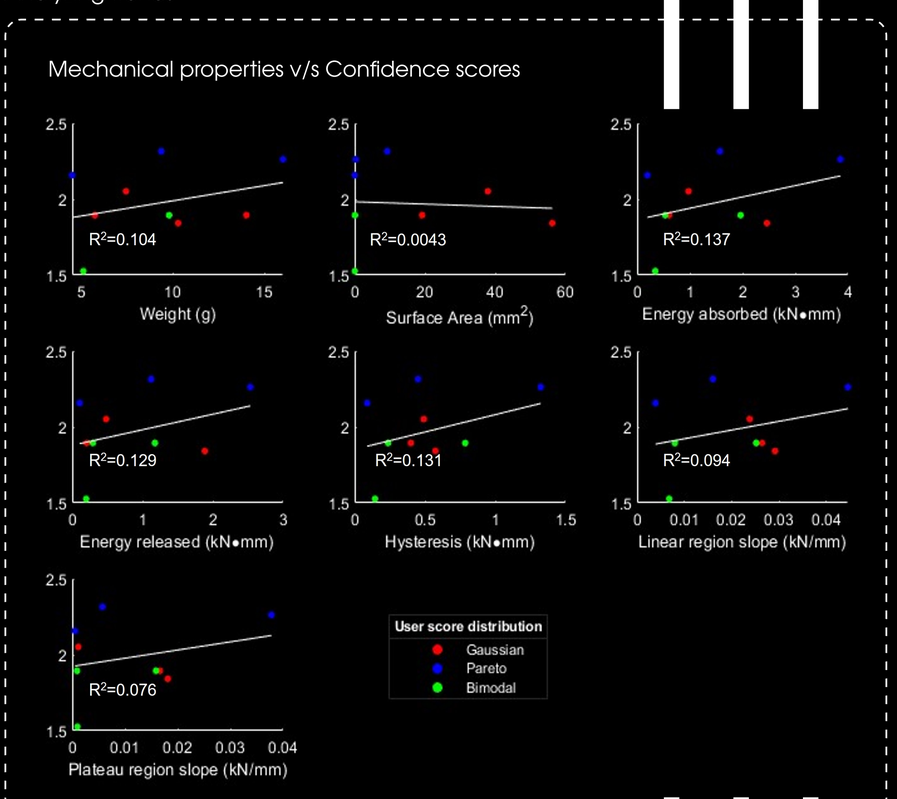
ME

What are the possible lattice structures?

1. Puck designs



2. Analyzing trends



Touch testing data collection

We asked 30+ participants to look and feel the pucks

Solution

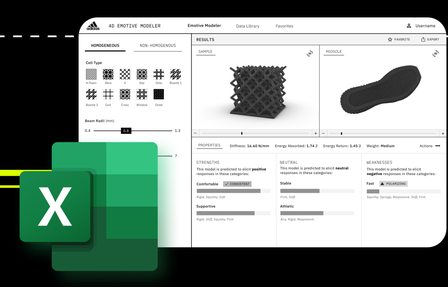
We discovered correlations between natural language keywords and mechanical properties

Correlations Between natural language keywords and mechanical properties

⊕ Positive relationship
⊘ No strong corelation
⊖ Negative relationship

	Confident	Excited	Relaxed	Sporty	Stylish
Mass	⊕	⊖	⊖	⊖	⊘
Surface Area	⊘	⊘	⊖	⊘	⊘
Energy absorbed	⊕	⊖	⊖	⊖	⊘
Energy released	⊕	⊖	⊖	⊖	⊘
Hysteresis	⊕	⊖	⊖	⊖	⊘
Linear Slope	⊘	⊖	⊖	⊖	⊘
Plateau Slope	⊘	⊖	⊘	⊖	⊘

What's next..?



We Documented data on an Excel sheet that will be available to Adidas engineers to check. We also proposed and user-friendly interface for potential development

HUMAN CENTERED DESIGN & ENGINEERING