Auxetic Textiles in Clo3D: Advancing Sustainability and Design Adaptability

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Abstract: This paper explores the feasibility of simulating textile structures with auxetic geometries using Clo3D and assesses the fidelity of these simulations compared to physical reality. Focusing on a specific fabric and auxetic geometry, we employ software for fashion design, with Clo3D being one of our tools, to simulate the fabric's behavior, meticulously comparing the results with its physical counterpart [1]. Our analysis delves into the intricacies of geometric changes, contrasting them with the sofware's algorithmic and mathematical models. Furthermore, we emphasize how incorporating physical auxetic geometries in textiles not only enhances adaptability for diverse forms, influencing design and comfort, but also plays a crucial role in promoting sustainability [2]. Through better adaptability, auxetic geometries have the potential to significantly reduce the number of required sizes, subsequently minimizing the stock of garments and aligning with sustainability goals. This investigation aims to answer the pivotal question: To what extent can digital textile simulation technology faithfully replicate the intricate dynamics of auxetic textile structures, and how do these simulations align with sustainability goals and enhance the design and comfort of textiles? The paper identifies limitations in the simulation process, contributing valuable insights to the broader discourse on the virtual representation of textiles. This research is a crucial step toward advancing simulation technologies in the textile domain and enhancing our understanding of auxetic fabric behavior.[3]

KEYWORDS: **Textile Simulation, Auxetic Geometries, Clo3D, Geometric Analysis, Mathematical Models, Design Adaptability, Textile Design Comfort**

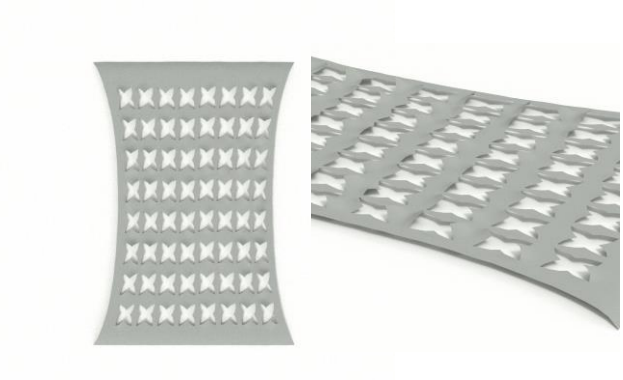

Figure 1 Virtual representations of an auxetic geometry on a simulated 2D fabric within the 3D software

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