Squama: Technique as a Generative System in Body Jewelry

Squama, an award-winning body jewelry project by Mehrnaz Zarrin Hadid, originates from a fundamental inquiry: can technique itself operate as a generative design machine? Rather than treating design and fabrication as separate phases, Squama investigates them as a continuous, intertwined process, where geometry, material behavior, and fabrication logic evolve simultaneously. This approach moves beyond surface ornamentation, positioning technique as an active driver of aesthetics and design intelligence.

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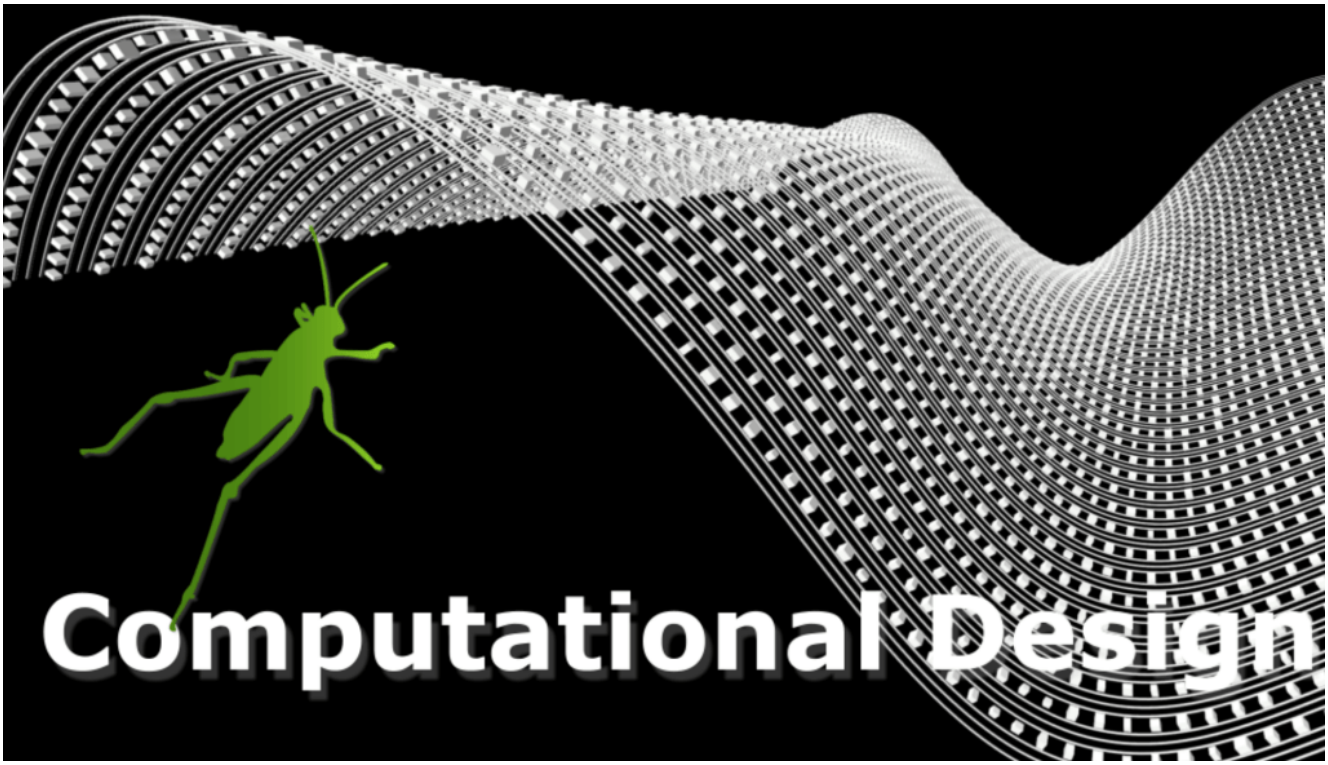
As the piece curves around the wrist, arm, or neck, its undulating surface captures and disperses light, producing a luminous gradient that changes with movement. Highlights and shadows slide across the

surface, transforming reflection into an active, responsive element. The name *Squama*, referring to overlapping plates or scales, evokes this layered behavior and the intricate light patterns it generates.

Silver process.

The entire design process was initiated and developed within a digital environment using Rhino and Grasshopper. These tools were not simply used for form generation, but as the core framework for managing geometry, parametric behavior, and fabrication feedback. From early explorations to fabrication-ready files, the workflow remained within the same digital ecosystem, enabling rapid iteration and precise control.



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Kerf bending was selected as the primary technique, prompting extensive digital studies of cut patterns and geometries. Initial prototypes were produced through 3D printing to evaluate flexibility, curvature, and overall behavior. Key parameters, including kerf spacing, cut depth, strip width, distribution, and curve radii, were systematically tested.

Designs were assessed based on their ability to transition convincingly from flat to three-dimensional form, conform to the body, and exhibit less predictable, richer spatial behavior. Geometries that remained too close to their flat state were discarded in favor of those offering greater freedom and depth.

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A crucial aspect of the project was adaptability. Using a single parametric system, Squama was designed to scale across different body parts, from wrists to arms to necks, without the need to create entirely new digital models. Gradient controls were introduced to manage curvature radii and separation from the body, allowing the piece to gradually move from a rigid bounding geometry to edges with more liberated forms.

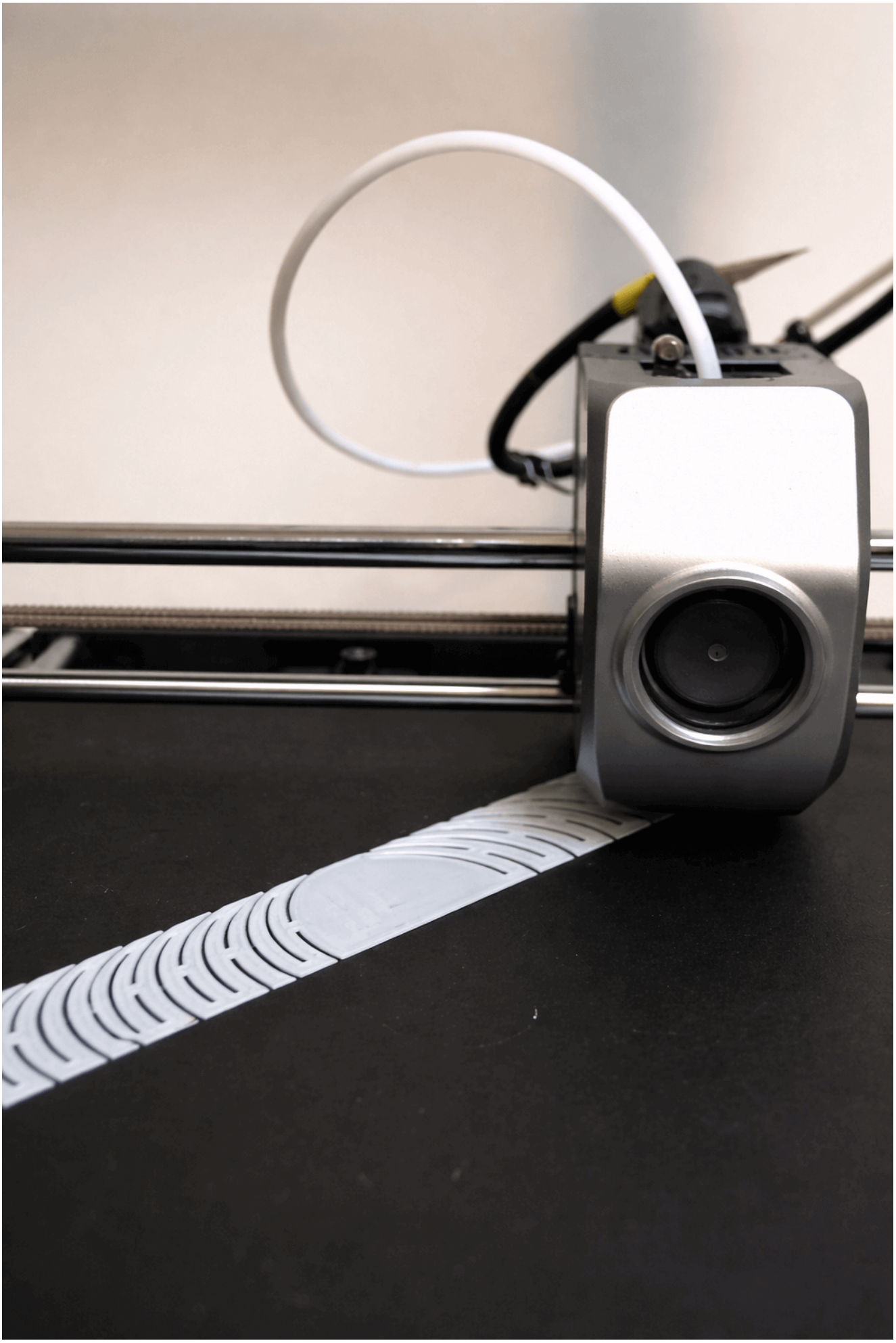
This parametric structure created an accelerated feedback loop between digital modeling and physical prototyping, where geometry, technique,

and fabrication constraints could be evaluated simultaneously.

Reflection bending test.

Material exploration proceeded in parallel with geometric development. Plexiglass, leather, copper, and steel were laser-cut and tested, with digital parameters continuously adjusted to account for variations in stiffness and flexibility across materials. Steel came closest to the intended behavior, particularly due to its reflective qualities, which amplified the perception of Squama as a “living” object responding to light and movement. However, its tendency toward permanent deformation after repeated bending led to the search for a more resilient solution.

Silver ultimately emerged as the most suitable material. By carefully controlling the alloy and developing continuous fabrication strategies, a balance between softness and rigidity was achieved. This ensured that the material could perform according to the design intent while preserving its reflective and expressive qualities. Despite fabrication challenges, such as laser length limitations and an insistence on continuity without joints or secondary components, a continuous assembly approach was implemented, maintaining both structural and conceptual integrity.



3D printing process.

Squama exemplifies a design methodology where form is not the primary goal but the result of an active system. Geometry, fabrication technique, and material behavior operate together, allowing technique to become the generator of aesthetics. Within the Kerf Collection, performance takes precedence over static form, positioning design as an ongoing process of exploration rather than the pursuit of a fixed final object.

Squama explores how fabrication technique can operate as a generative design system, transforming flat silver into a responsive body landscape through parametric kerf bending.

CREDITS

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