

TEXTILE + DESIGN LAB

Case Study Number: 10/2021

Project Title: Seamless Knit – Dimensions Unfolding: An Investigation of 3-Dimensional Knitted Form-Building

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Project Description:

This PhD research investigated the latent 3-dimensional form-building capability of digital seamless knit technology with the intention of demonstrating the potential of knitted fabric within a new and emergent design dimension; one underpinned by 3-dimensionality, volumetric forms and tactile surfaces.

Background:

Developed for the knitwear industry in the mid 1990s, seamless knit technology emerged from radical technical innovation and enabled a new mode of textile production: complex 3-dimensional knitted forms could be fabricated in a single machined process. The technology's potential for innovative form and function beyond garment production is widely acknowledged. However, there remains uncertainty as to the attributes and parameters of this potential, particularly in the area of 3-dimensional non-garment form. The technology's positioning in an industrial knitwear environment and the format of its proprietary design interface have constrained access and understanding of its capacity, resulting in limited recognition or use of its unique capability as a 3-dimensional textile fabrication tool.

Process:

By means of a practice-led design inquiry, this research engaged in a conceptual displacement of seamless knit technology in its endeavour to extend knitted form beyond surfaces that mould and move around the body, to focus on those that enclose 3-dimensional geometric forms. The research was guided by an architectural form-building approach, using performative operatives in the systematic fabrication of 3-

dimensional cubic geometric forms; configurations commonly referenced across domains such as architecture, industrial design and engineering.

Project Outcomes:

Through this process, a knitted form-building methodology encompassing a cubic form-building system was established, suggesting an alternative way of thinking about knitted form. The system is supported through articulation of a cubic form-building domain that includes initial components for a 3-dimensional form library alongside a system of textual, symbolic and visual representations. In addition, tools and resources have been developed to support the translation of 3-dimensional geometries into the knittable surfaces of the technology's 2-dimensional programming grid and a range of 3-dimensional cubic artefacts has been produced, providing physical representation of previously unrealised fabrication capability through easily decipherable objects.

The research and its findings demonstrate a space of possibility – of what could be – through new ways of approaching knitted form. More specifically, the research presents an alternative method of design with seamless knit technology, supported by a range of resources that allows the advanced 3-dimensional form-building capability to be accessed, understood and further explored by a broader range of design practitioners.

Value of Textile and Design Lab

This research could not have been conducted without the lab, encompassing specialist knit technologies and the support of knit technician Gordon Fraser. Further, Peter and Gordon's trust in the researcher's ability to work independently and explore freely allowed the project to be taken much further than expected. The researcher is truly grateful for the level of support that she received from the lab as she progressed from undergraduate to postgraduate study and for the experience this has given her.

Publications:

www.openrepository.aut.ac.nz/handle/10292/13826

Images:



