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# Crocheting Algorithms

*"The loop stitch is a noeud coulant: a knot that, if untied, causes the whole system to unravel. It is an element in making stockings, in knitting and crocheting, and the particular way it is formed is dictated by the tools employed and the use intended. [...] I can only say that it is an extremely refined [art] and yields products whose properties can be achieved in no other way. They carry the elements of their richest ornaments in themselves and in their construction. Elasticity and ductility are the specific advantage of these products; this makes them especially suited to close-fitting dressings that embrace the figure and define it without fold."*

*Gottfried Semper, 'Style', 1860, Getty Publications (2004)*

Crocheting is to make a fabric by intertwining yarn in a series of connected loops using a hook. It activates a single line to generate an elastic surface by moving around and through an empty core. The topology of a crocheted fabric is relatively complex. The thread follows a loopy path along its row, with the loops of one row being pulled through the loops of the row subjacent to it. The elasticity of a crochet piece is unavailable from woven fabrics, which only stretch along the bias. In studio projects, students explore crochet as a conceptual model of fabrication and examine its topological traits as well as its ductility. They employ the properties of the technique, its local rules, continuity of the thread and algorithmic qualities to discover spatial possibilities. A series of exercises explore rule-based design methodologies through model making and analytical drawings and serve as introduction to non-Euclidian geometry. They serve to understand a script syntax and its formal output within the confines of a single line trajectory.

Using diagrams, 3D modeling and scripting, space formations are created that reference performative moves and behaviors of crochet stitching. Crochet stitches are "read" for their spatial qualities, and programmatic values assigned accordingly. In several iterations students move from initially notating existing stitches to invent individual stitch taxonomies. Local to global interdependencies are observed as well as architectural arguments such as enclosure, connectivity, proportion and scale. Through the stitch diagrams, strategies for models of program and of possible geometries are developed. In them, program activities are placed and tag along others to generate new spatial associations. The movement of the line through space in conjunction with its affiliate qualities becomes an indicator for program potential, and effects distinct architectural expression. The models are subsequently informed by material considerations and site conditions. This formation provokes scale shifts, ruptures and greater spatial specificity. By probing performance characteristics and their compositional feedback capabilities in 3D models as well as through scripting, spatial articulations for the proposed program surface.