ALGORITHM DEVELOPMENT FOR COMPUTATIONAL KNITTING

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Course Number - EEN1010 [Design/Practical Experience]

MOTIVATION

Computational knitting enables:

- Seamless fabrication of textiles with complex 3D geometries and topologies.
- Local control of yarn distribution and functional characteristics.

It has new like fashion, smart textiles and electronics, medical and assistive technologies, architecture and civil engineering, etc.

Computationally knitted fabrics have more strength and are more flexible than hand knitted fabrics. Also it is faster than the traditional method.

OBJECTIVES & TARGETED DELIVERABLES

- Make the high-level design independent from the low-level instructions
- Fast and easy configuration of stitch pattern and yarn material.
- Retain low level control over the instruction generation stage.
- An implementation of an algorithm for computational knitting.

Input Design

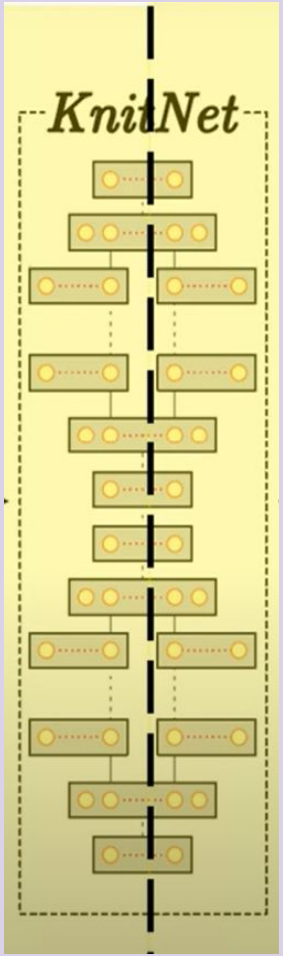
Building KnitNet

KnitNet

Machine Processing

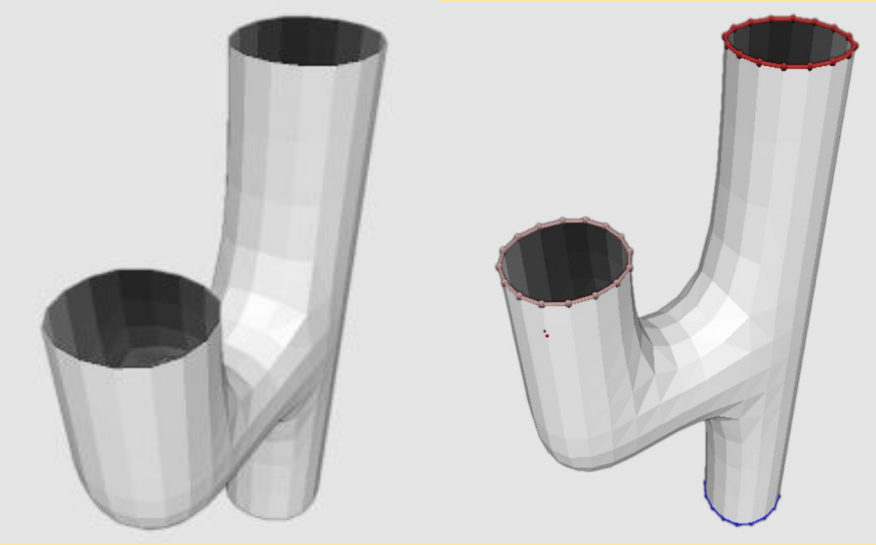
Output

Building the KnitNet

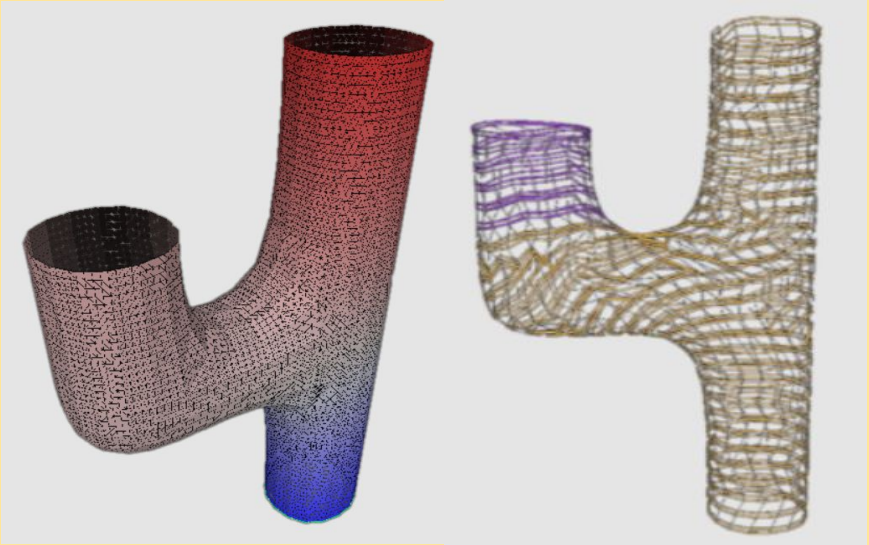


STEPS FOR CREATING KNITTING

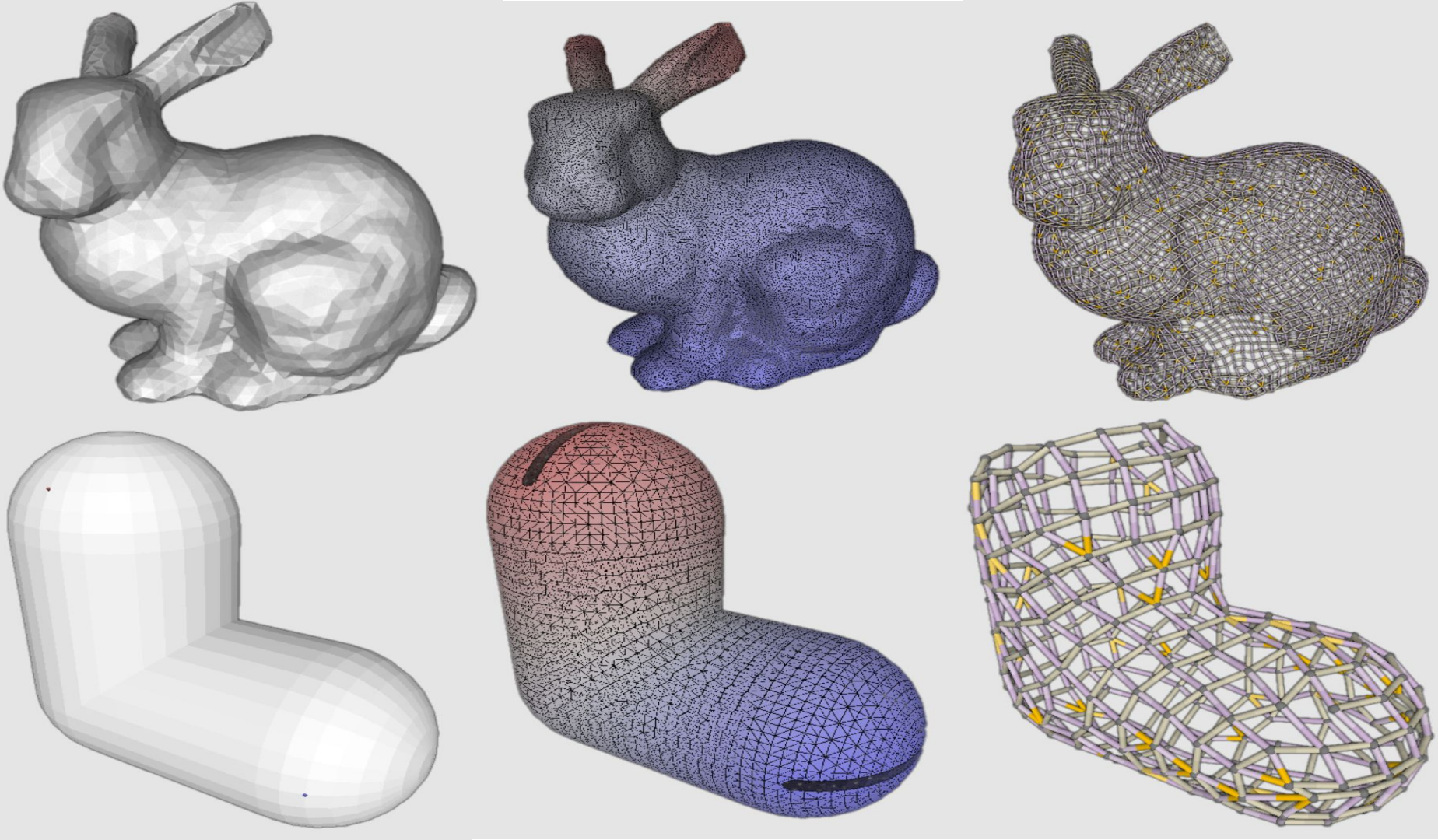
1. Adding Constraints

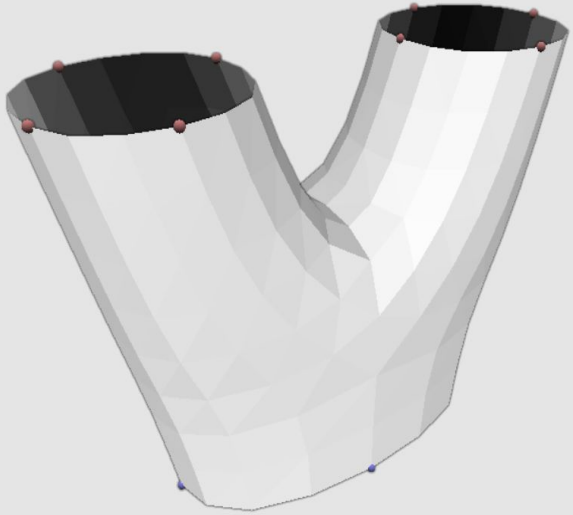
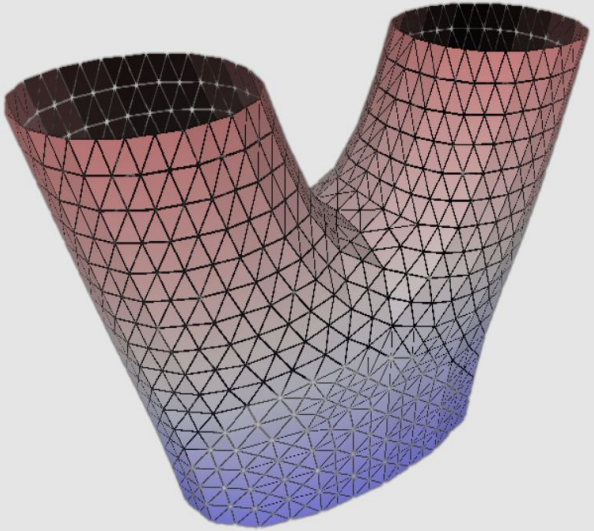
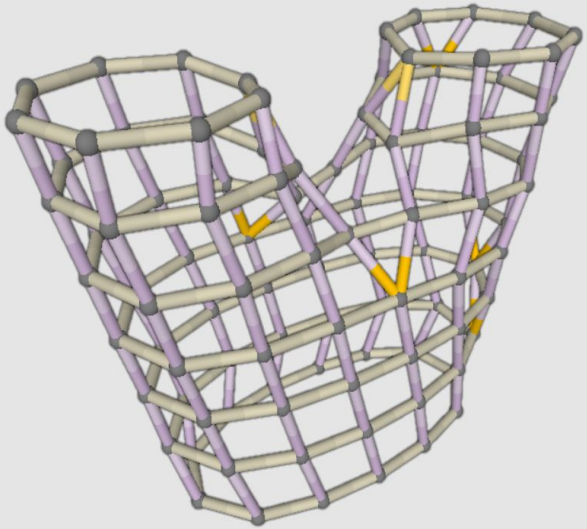
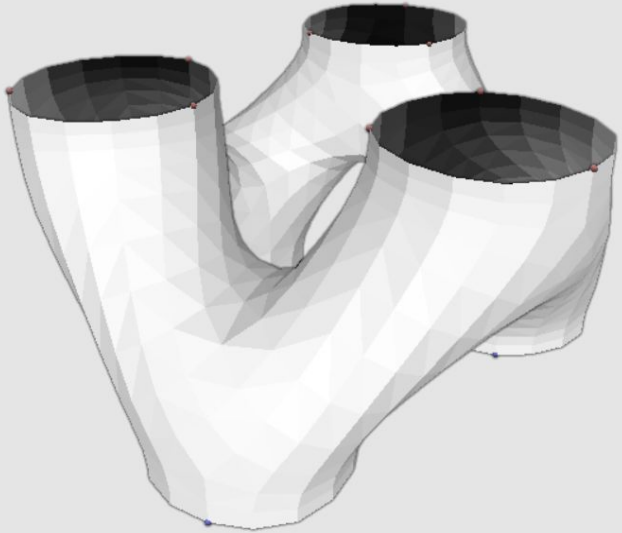
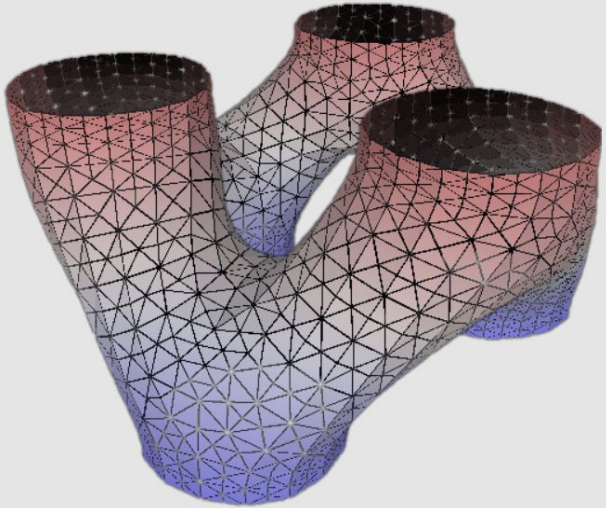
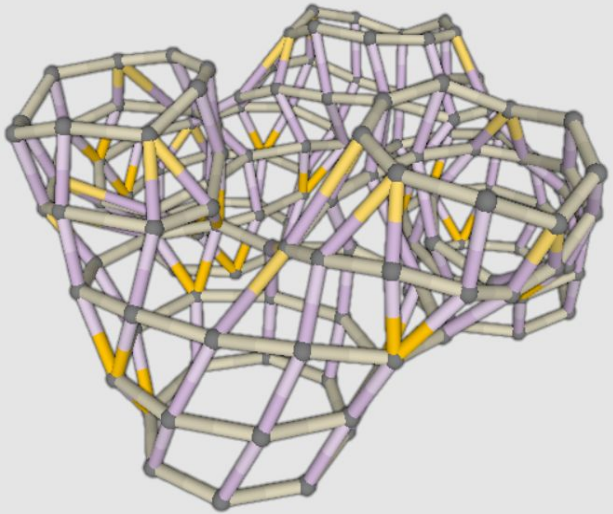


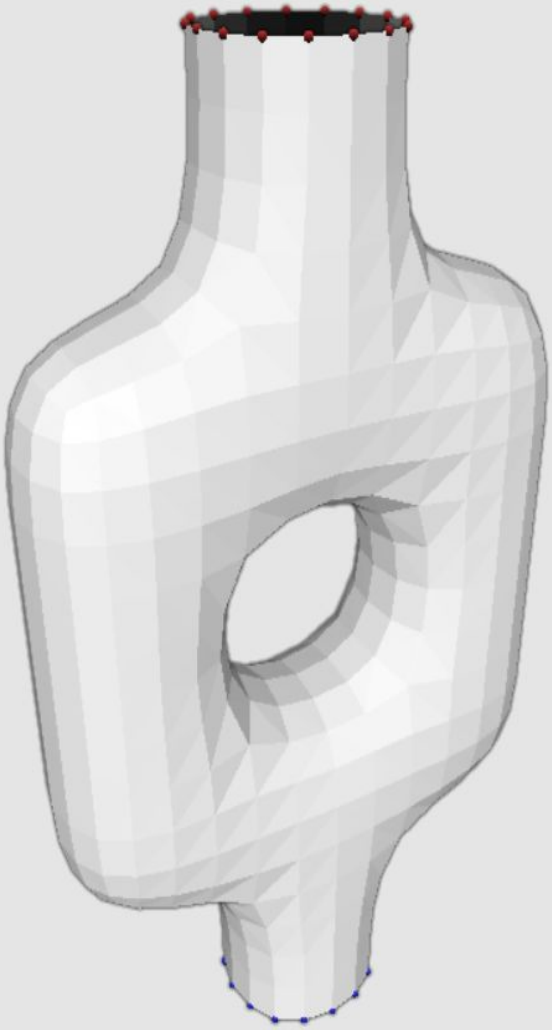
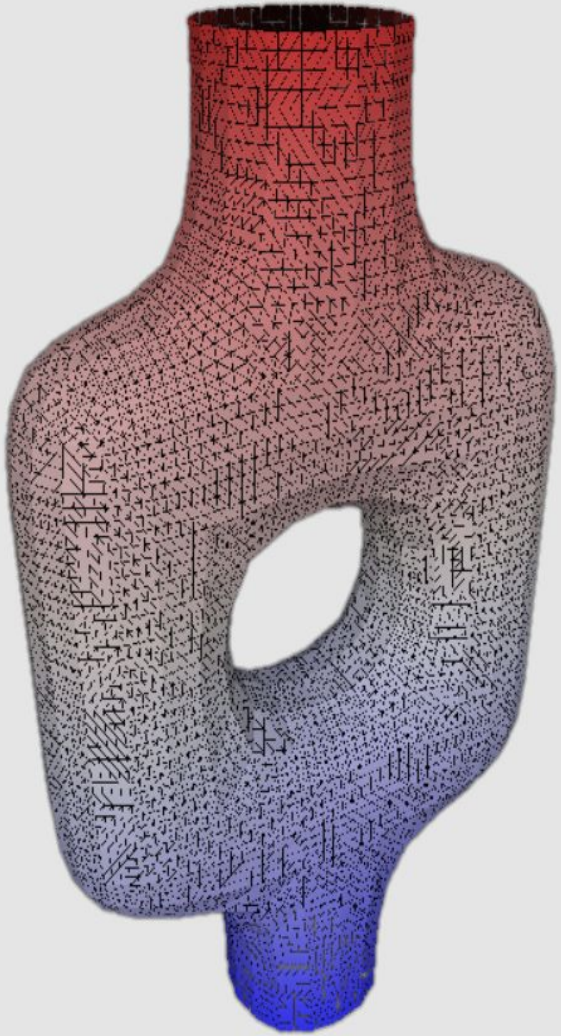
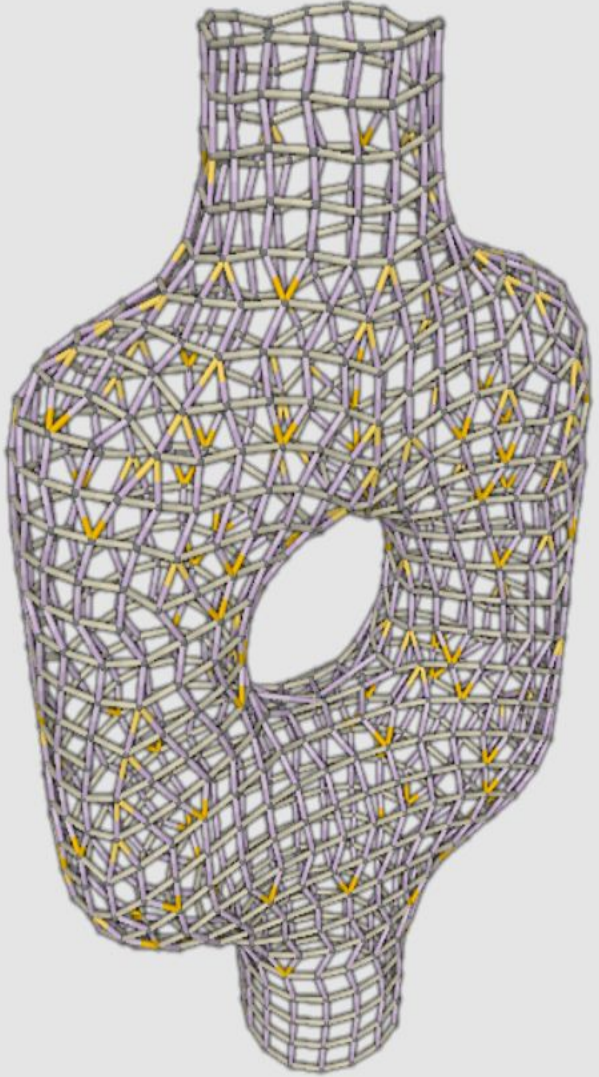
2. Peeling / Linking



3. Scheduling
4. Knitout



RESULTS & CONCLUSIONS

- The algorithm works on various 3D objects and garments of various shapes can be easily made.
- The system simplifies the knitting of 3D objects with complex, varying patterns that use multiple yarns and stitch patterns by separating the high-level design specification in terms of geometry, stitch patterns, materials or colors from the low-level, machine-specific knitting instruction generation.