



RhinoCeros®

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Grasshopper

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WASP

Benefits derived from WASP (a Grasshopper plugin) to Design for Disassembly principles in the built environment

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Introduction

- Research question: ***"How can the WASP, a Grasshopper plugin, aid the practice of DfD in the built environment?"***
- ***DfD principles:***
 1. The aggregation processes of part geometries in WASP.
 2. Connection locations.
 3. The orientation toward the building elements.

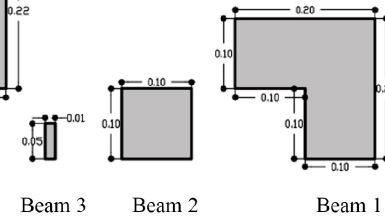
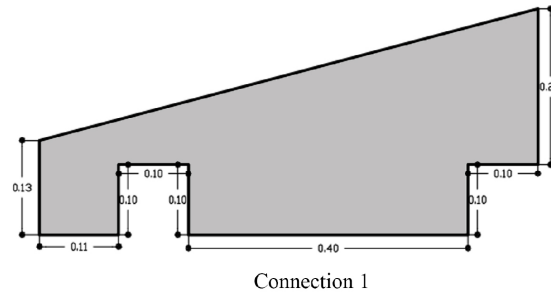
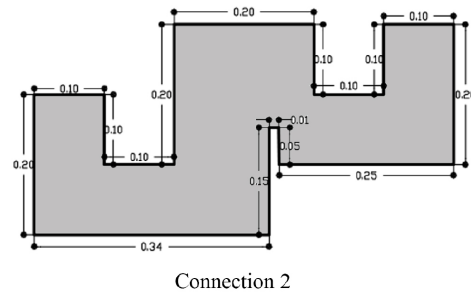
DfD evaluation:

1. Functional decomposition: systematization and clustering
2. Technical decomposition: Relational patterns
3. Physical decomposition: assembly sequences, and type of connection.

Introduction

- *WASP plug-in for Grasshopper:*

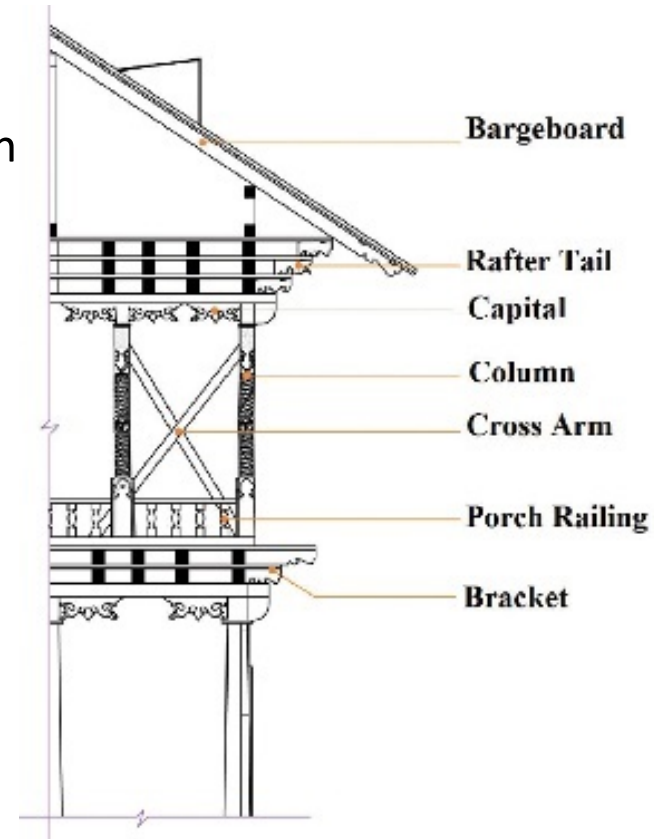
As a toolkit for discrete computational design to simulate the aggregation and assembly possibilities in the building system.



Five types of element sections are repeated in the modular system.

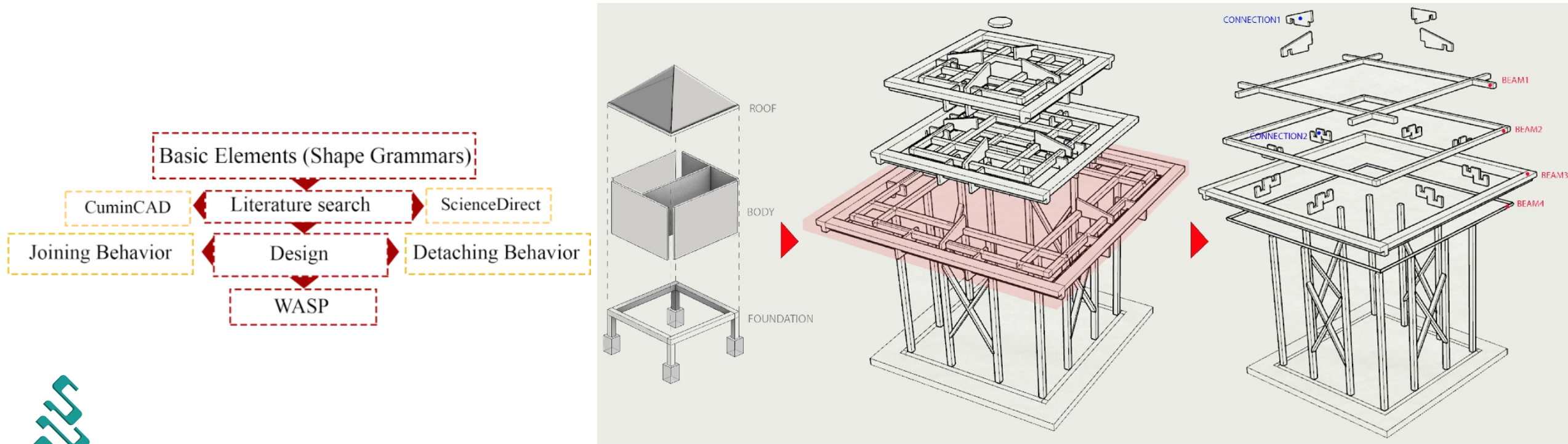
- *Iranian-inspired timber structure:*

Section of the woodwork with details in Saqa Nefars, Babol, Mazandaran



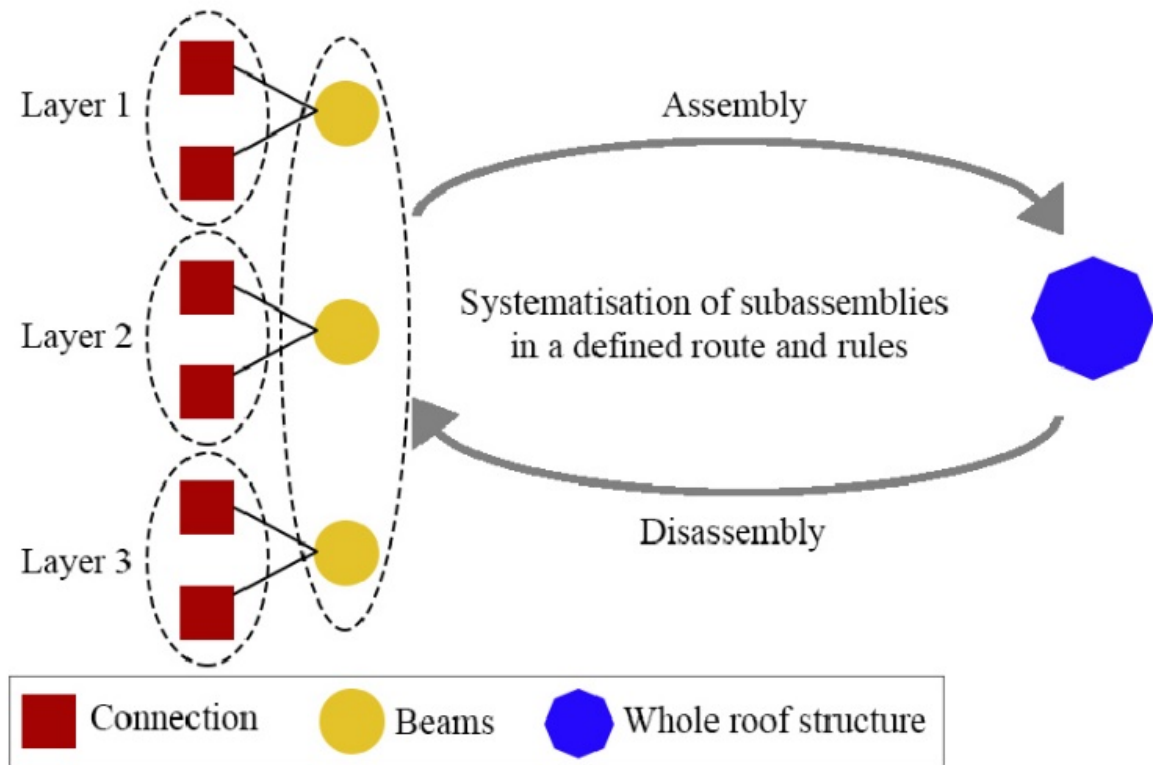
Method

- Elements of the entire timber pavilion in three levels with the detailed main “Part” geometries of the roof:



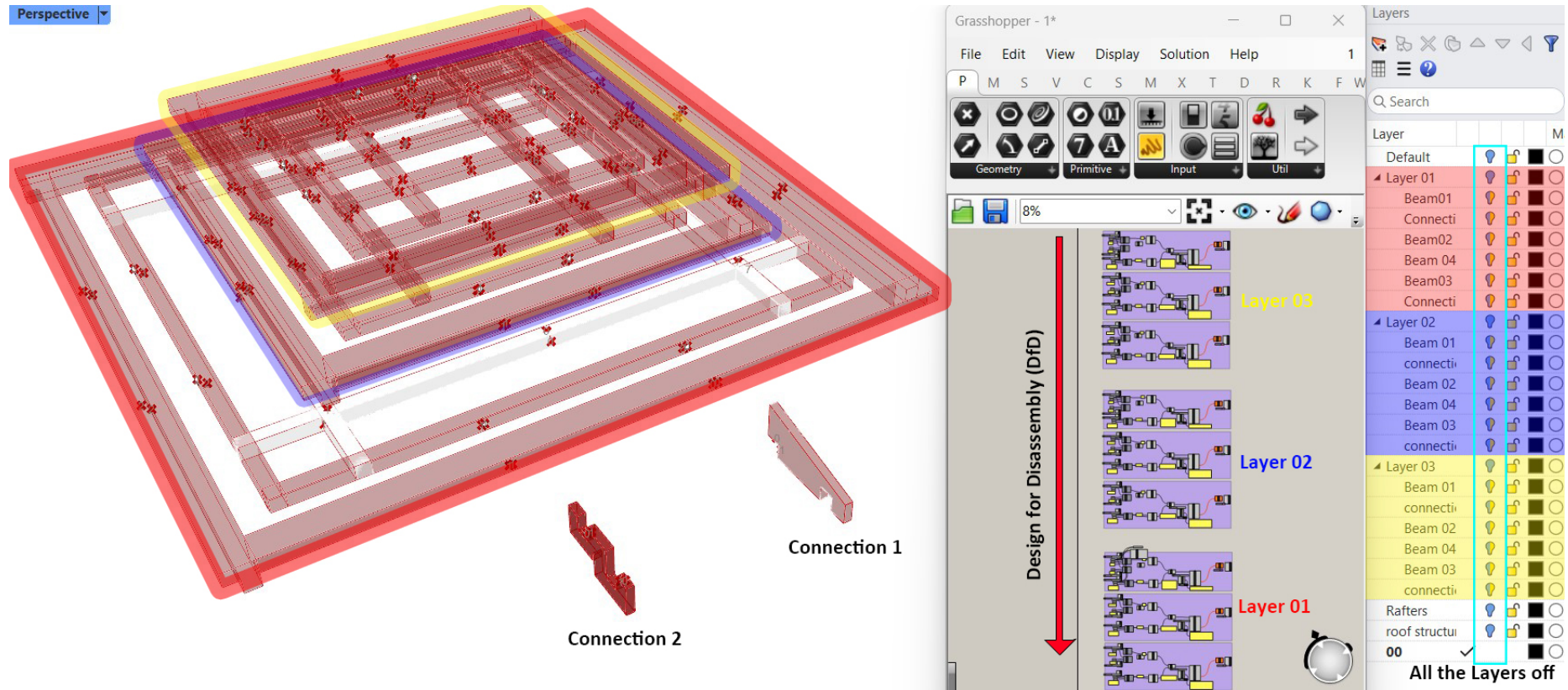
Result and Discussion

- Clustering of building structure into assembly and disassembly clusters:



Result and Discussion

- The function of WASP in locating the elements in their defined points with all layers off



Conclusion

Future studies: Field-driven aggregation by a curve as a route around three levels of roof structure

