Computational Design & Assembly of *Infinitely Reusable* Kit of Parts

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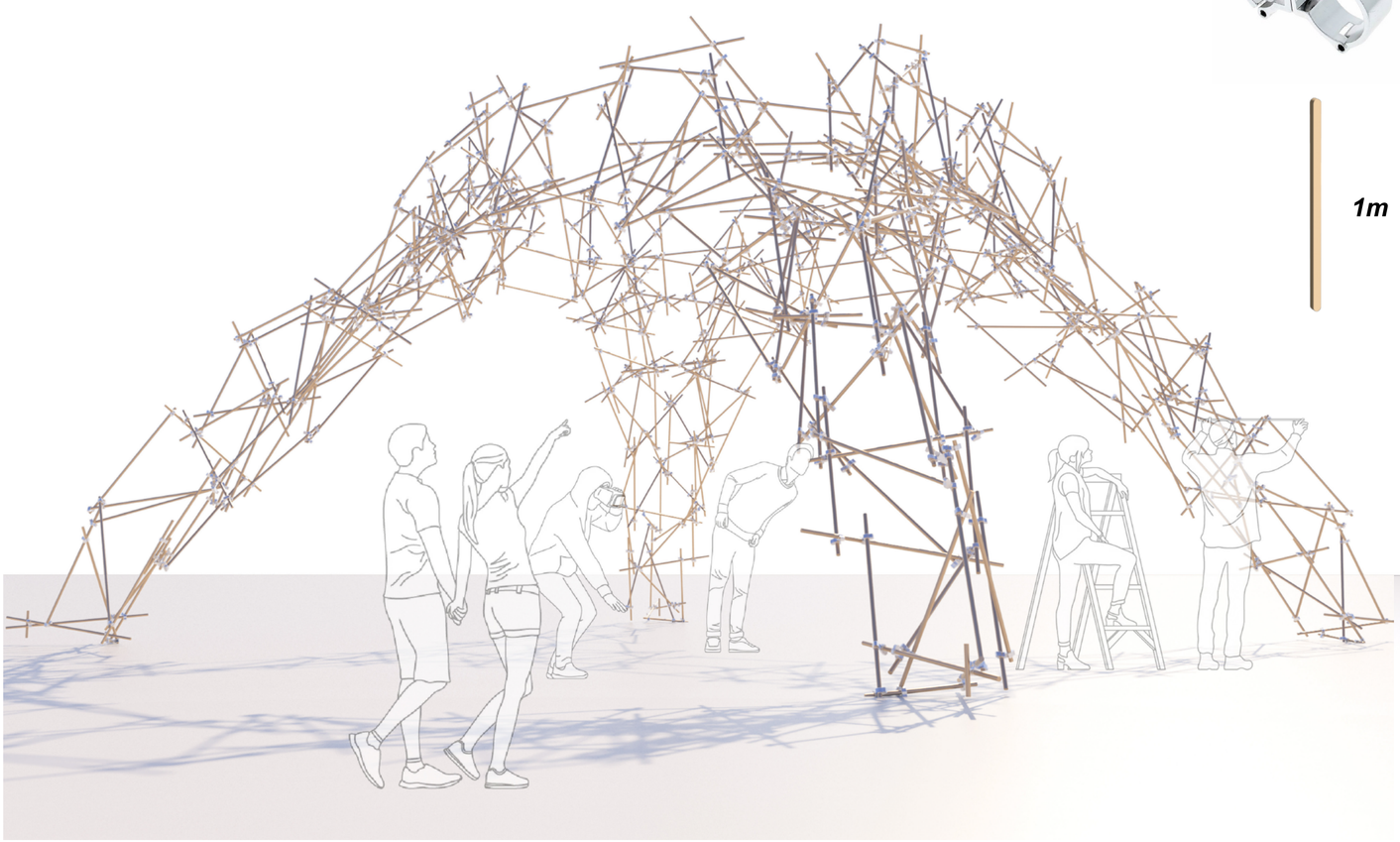
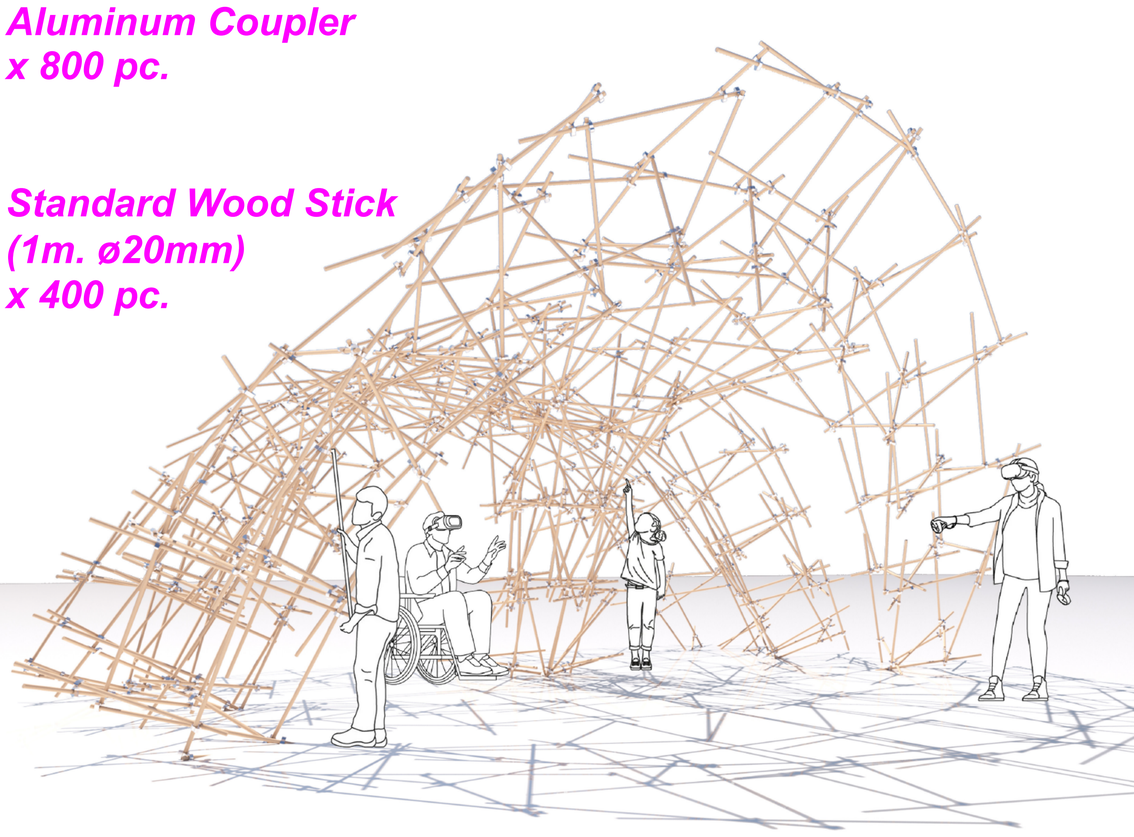


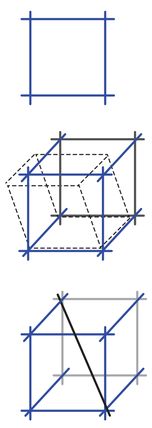
Aluminum Coupler
x 800 pc.

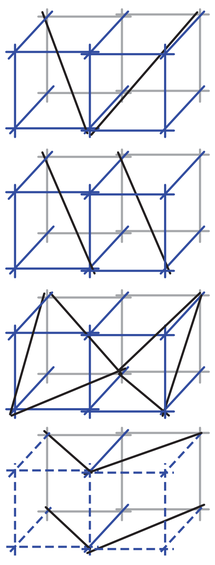
1m

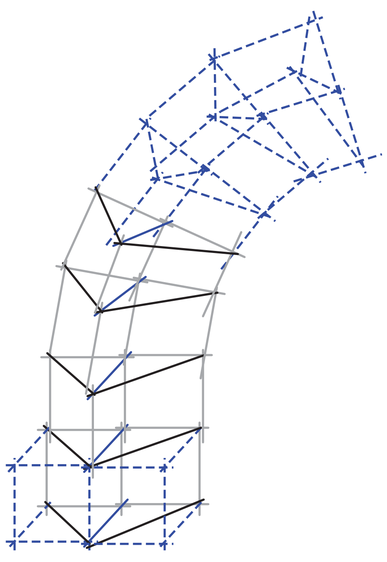
Standard Wood Stick
(1m. ø20mm)
x 400 pc.



Geometrical Study

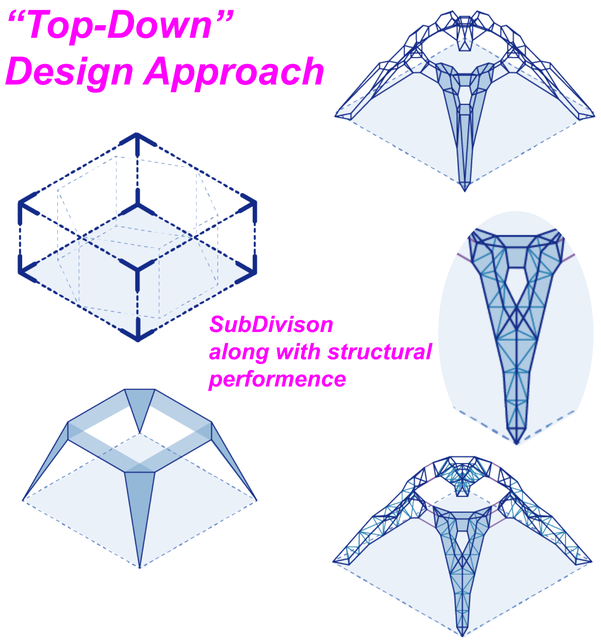






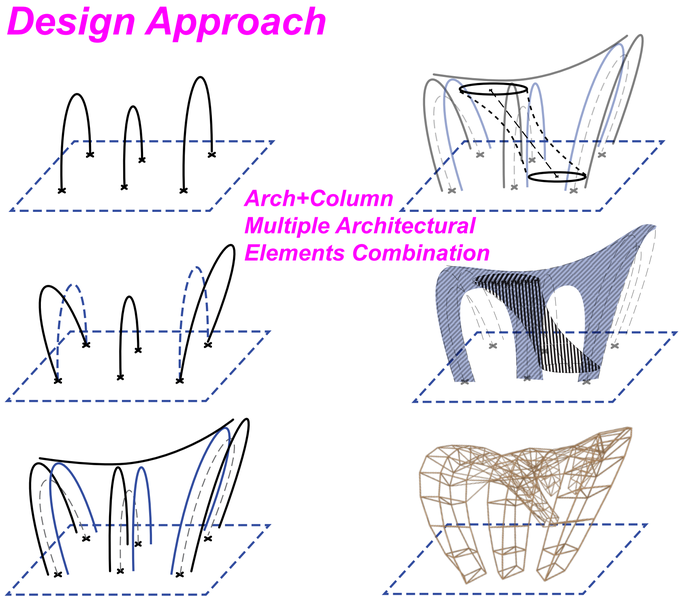
This project explores methods to build a fully reversible and multi-purpose space frames by combining standardized components (1 m wooden sticks and couplers) with computational design tools and Augmented Reality fabrication tools. The computational design tool is based on the "Frame X" algorithms, which automatically optimize the composition of couplers and bars.
The geometry is computationally generated then the algorithm is recalculating the structure with offsetting the bars and coupler rotating. As on site assembly process, the geometry is exported to HoloLens which is assisting user locating parts.
Both full scale pavilion designs have been realized with the system which demonstrates both the flexibility of the of the design an assembly approach as well as the robustness of the FrameX algorithm and shows that this system enables circular construction.

"Top-Down" Design Approach



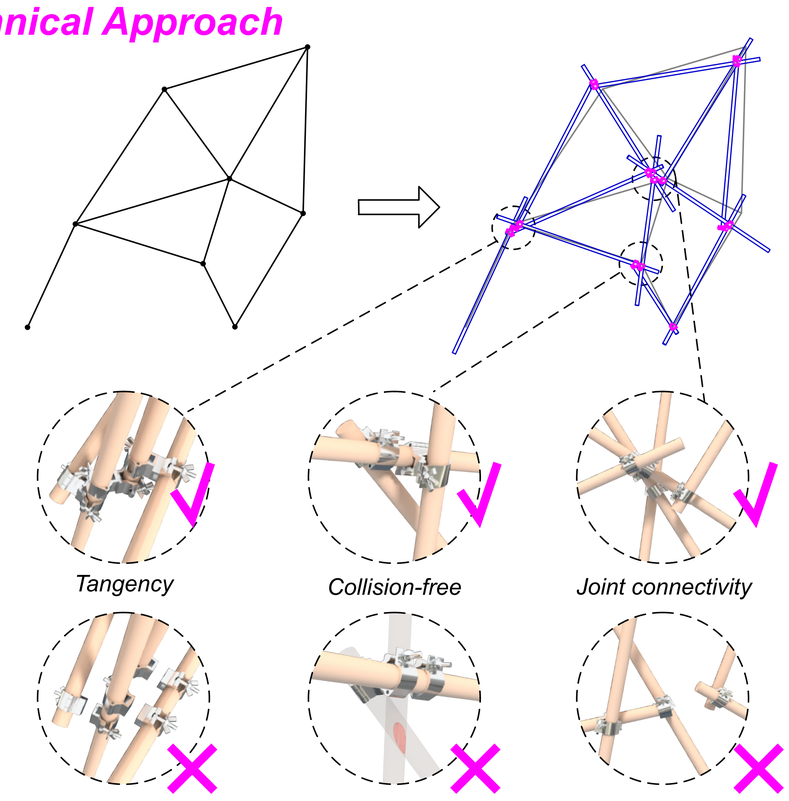
SubDivison along with structural performence

"Bottom-Up" Design Approach

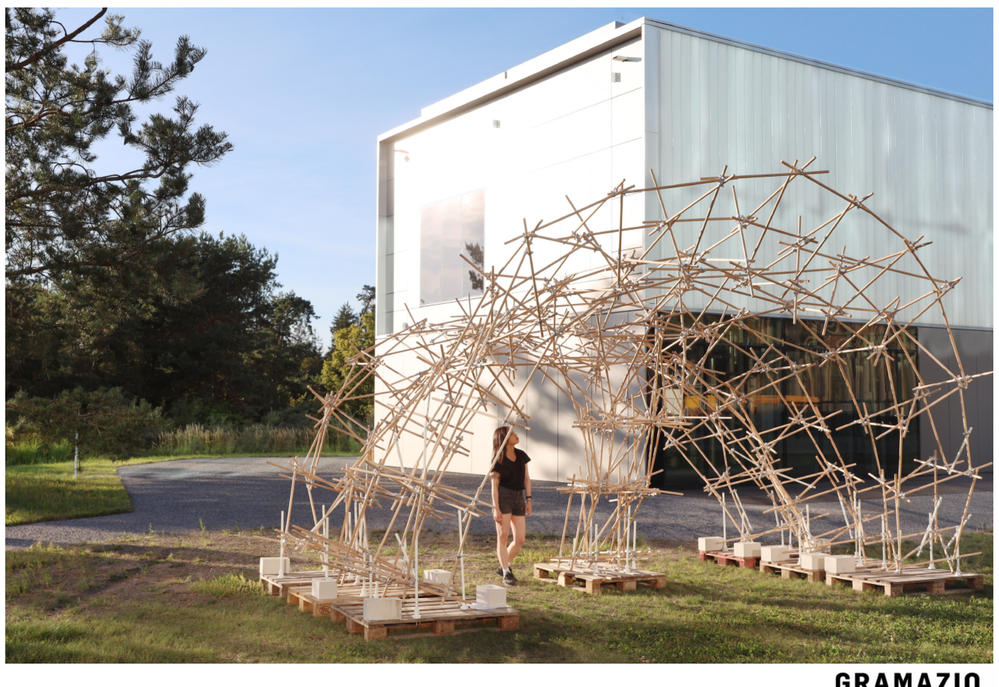


Arch+Column
Multiple Architectural Elements Combination

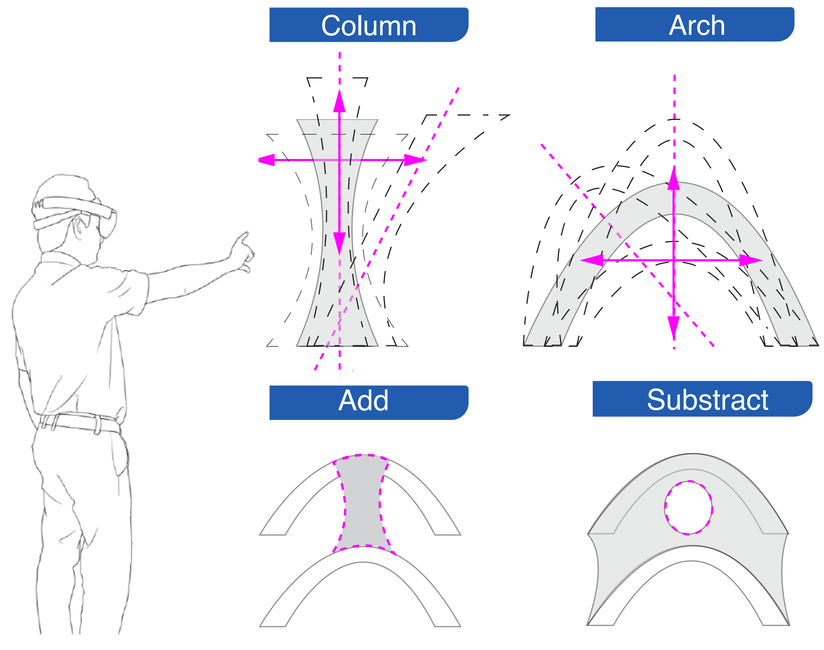
Technical Approach



AR-assisted Assembly



Future Work: AR-assited design



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