



MOSM – Design for Additive Manufacturing

Final project:

Garden chair or bench redesign: lattice optimization and topology optimization in Grasshopper

Version 1.0 Spring 2024

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Material definition: PLA (find the Young's modulus and Passion ration).

Boundary condition: load force or surface load (based on your design domain and requirements.)

Final submission: You should provide me with a document to describe your design and optimization process, including your original chair prototype and proposed design domain for optimization, material properties, boundary condition setting, design variables, optimization function setting, et al.

Attach your grasshopper file to me.

Something more: You can also directly generate a large amount of design chair or bench candidates by using Octopus component (Multi-objective evolutionary algorithm (MOEA)).

For this, you can use two objective functions: weight and maximum deflection (used in TP2).

Add more words to describe your multi-objective optimization process and setting.

Another MOEA plugin can be used for this optimization.

(https://food4rhino.com/en/app/wallacei)



MOEA plugin: Wallacei.

Deadline: Before February 29, 2024.

Group: Two, three or four persons (recommend two or three student as one group)

Example:

You can construct a design domain using two parametric surfaces or based on a solid model in Grasshopper,



Design domain based on two parametric surfaces and lattice infilling.



Optimized thickness-aware lattice structure chair support.



A case study for a lattice optimized chair.

Part chair examples:











References:

All chair and bench pictures from google images.