

3. What is parametric design? What are the benefits of a parametric approach? What tools are available for parametric design?

Parametric design is a technique for embedding variation directly into your design. If a design has two dependent variables, their relationship would be parametric. For example, if you go to an ice cream shop with different cup sizes, the radius of the cups will all be the same but the height and the volume of the cups will vary according to the size. Because both the height and volume are dependent variables, their relationship would be parametric. Changing one variable of a parameter will affect all the other variables as well. If the ice cream cup height changes, then the volume will change as well. Parametric design has several benefits attached to it. For example, if you create a design using parametrics, the original design gives you the ability to vary the dimensions without having to reconstruct any of the geometry. Additionally, parametric design is especially helpful for customizing, personalizing, and iterating your design. One can make several changes to their design just by tweaking a few variables. Overall, parametric design gives you easy accessibility to modify a design to your liking while making it straightforward and simple. For the standard 3D parametric design, you can use several modeling softwares such as Rhinoceros 3D, Maya 3D, and Blender 3D. Furthermore, if someone is comfortable with coding then they can try out OpenSCAD. Additionally, good coding platforms such as openFrameworks and Processing offer extensive libraries for programming parametric forms. As a result, parametric design is a great way to design a model and it allows variation while keeping it uncomplicated.