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**FOR DEEP LEARNING AIDED DESIGN STUDIES WITH PARAMETRIC DESIGN  
CREATING AND EDITING A 3D DATASET**

**Gülçin Ural**

Graduate School of Natural and Applied Sciences, Faculty of Technology, Department of Industrial Design  
Engineering, Gazi University, Ankara, Türkiye  
0000-0002-0895-682X

**Prof.Dr. Hüseyin Rıza Börklü**

Graduate School of Natural and Applied Sciences, Faculty of Technology, Department of Industrial Design  
Engineering, Gazi University, Ankara, Türkiye  
0000-0003-2107-6664

**Gülçin Ural \***

Graduate School of Natural and Applied Sciences, Faculty of Technology, Department of Industrial Design  
Engineering, Gazi University, Ankara, Türkiye  
0000-0002-0895-682X

**ABSTRACT**

In this study, the creation of a structure using the parametric design methodology is explained in detail [1]. More design possibilities lead to more cost-effective structural solutions being found early in the design process, saving money on other stages of the process, including production costs. In view of this, it's critical to present structural analysis to help the designer's decision-making and to generate multiple solutions in order to identify the optimal one [2]. An optimization technique using new methodologies for product design and parametric design is pursued in order to find more design alternatives. With parametric design, you may decide on the fundamental characteristics of your project and make interactive modifications while your model is automatically updated. Additional possibilities and optimize structures with more efficient designs could be found. Delivering components that are stronger, lighter, more efficient, and adapted to the individual demands of structure is the main goal of productive design [3,4]. Among several design options, the optimization aim is to produce a structure with the most ideal mass. This study aims to establish a workflow and explore the potential applications of parametric design and productive design [5]. This research makes it possible to quickly assess a large number of possibilities and choose the best design. In order to provide that a sustainable design a master geometry is created. The steps of the design process and creation of master geometry are described on the basis of an aircraft component, the rotor blade mounting bracket that serves as a structural support for the blade and ensures that the blade remains securely attached to the main structure of the rotor. This optimization scenario may be varied and used to various projects since it is achieved with the aid of the rotor blade mounting bracket. Hence, it is easy to vary the design to generate more data for designing with deep learning methodology in the future.

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\* Corresponding author. e-mail address: ural.gulcin@hotmail.com



**References:**

- [1] Schnabel, Marc Aurel. (2012). Learning Parametric Designing. 10.4018/978-1-61350-180-1.ch004.
- [2] Shah JJ. Assessment of features technology. Comput-Aided Des 1991;23(5): 331–43.
- [3] Iyer N, Jayanti S, Lou K, Kalyanaraman Y, Ramani K. Shape-based searching for product lifecycle applications. Comput-Aided Des 2005;37(13):1435–46.
- [4] Jackson C, Buxton M. (2007). The design reuse benchmark report: Seizing the opportunity to shorten product development, Boston, Aberdeen Group
- [5] Gebhard R. (2013). “A resilient modeling strategy” technical presentation. Solid Edge University

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