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Application of CAD/CAE/3D printing to development of magnetic foldable hanger

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Author(s)[Chi-Yuan Hsia](#) ; [Shao-Yi Hsia](#) ; [Yu-Tuan Chou](#)[View All Authors](#)**Abstract**[Authors](#)[Figures](#)[References](#)[Citations](#)[Keywords](#)[Metrics](#)[Media](#)

Abstract:

A lot of things in daily life are manufactured and processed the articles through several passes that the costs of production are comparatively higher. Modern 3D printing allows the required articles and components being produced at home to reduce the expenses and time for contracted processing. Nonetheless, 3D printing is restricted to the material so that it could not present the strength and accuracy as metals do, under the comparison between the same articles. In this study, CAD/CAE/3D Printing technology is utilized for developing a magnetic foldable hanger. SolidWorks, the computer graphic software, is first used for graphing component. The Simulation Finite Element Method in the software is then used for the analysis to find out the stress and strain of the material with weight. The simulation analysis diagram reveals the amount of deformation and the place of the maximum deformation caused by the force generated by hanging clothing on a magnetic foldable hanger. Meanwhile, whether the equivalent stress induced by the material would exceed the limit of the new-style clotheshorse could be known. The above simulation result could be the reference for the improvement in the design analysis. The completed design plan could be converted to the format required for 3D printing to transfer print solid elements, which are further assembled the magnetic foldable hanger in this study.

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Introduction

An object in national industry used to be processed with traditional processing machines or made manually, presenting low efficiency, time consuming, cost consuming, and work consuming. In such an efficient era, a lot of advanced processing machines have been developed for automatic processing by transmitting computer graphics to computers for automatic calculation. It not only enhances the production efficiency but also achieves an extremely high accuracy. It is rather inconvenient to repair or change small objects in the life. The most popular 3D printers attract the public because they do not require large space, can be easily handled, are convenient for home use, and do not need factory operation. 3D printers therefore reveal great development space in the future trend.

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