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Reverse Engineering Implementation in CAE Analysis

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Abstract- *Reverse engineering can be the simplest, easiest and most accurate way to change the complete scenario of product analysis that has ever been done. Each time designers try to analyze products which are already in the market to make them better, having a 3D CAD model is the main fundamental obstacle. Because of certain copyright issues 3D cad model from a parental company or designer is not easy in realistic condition so the only option left with traditional measurement methods to measure the 3d object, which is not feasible due to complexity of part. So we purposed a new technique of reverse engineering by which we can scan the physical object and generate a 3D CAD model by advanced software. This method is quite much accurate as compared to traditional measuring techniques and give better & fast results at very earlier stage of research analysis. Which ultimately change the new era of analysis of designers.*

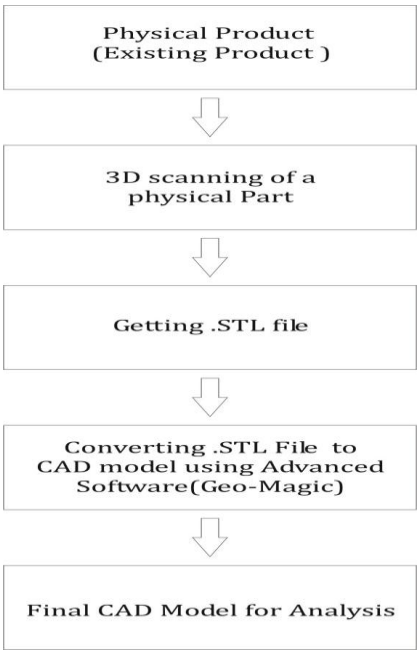
Key Words: Physical Object, 3D CAD model, traditional measuring.

Introduction

Reverse engineering is the process of engineering backward to build a CAD model geometrically identical to an existing product. Subsequently, CAD models are used for manufacturing or other applications an example application is where CAD models are unavailable, unusable, or insufficient for existing parts that must be duplicated or modified. An object is digitized by the 3D object digitizer and data is then fed into surface reconstruction software, which outputs a smooth surface model. [1]

Material & Method

We created a new flow chart to use reverse engineering to obtain a 3D CAD MODEL for analysis purposes



Physical object

We arrange the aerodynamic shaped drone blade for our analysis purpose, which is quite complex to measure with conventional measuring technique.

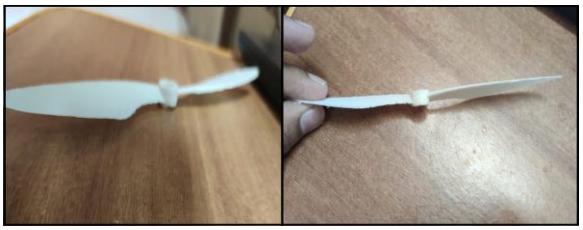


Fig -1: Physical Object

3D scanning of a physical object

After the physical object has been arranged, our goal is to scan physical objects to create a digital 3D model. For this purpose we used turntable and fixed scan mode in Ein SE scanner.

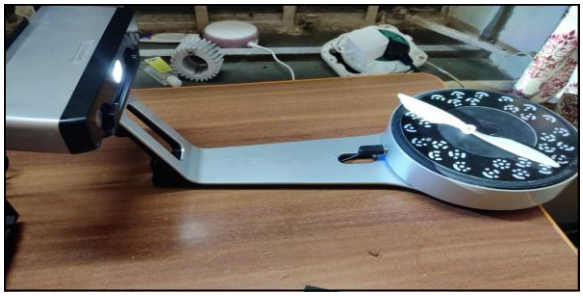


Fig -2: Scanning of physical object

Getting .STL file

For generating and proper meshing of .stl file, we used 3D scanning software.

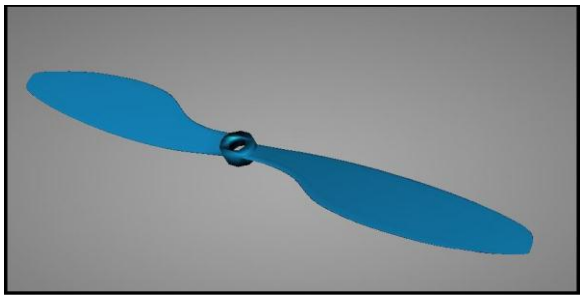


Fig -3: Getting .STL file

Converting .STL File to CAD model using Advanced Software (Geo-Magic)

Measurements were covered with great precision, further we ANSYS software for analysis to get an optimum results for our research.

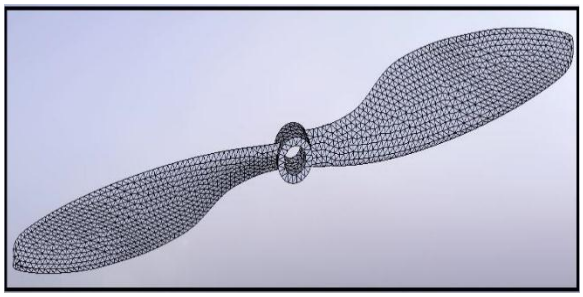


Fig -4: Meshing

Analysis

Reverse Engineering provided us with a very accurate and quick cad model for research purposes, the critical angel and all other relevant

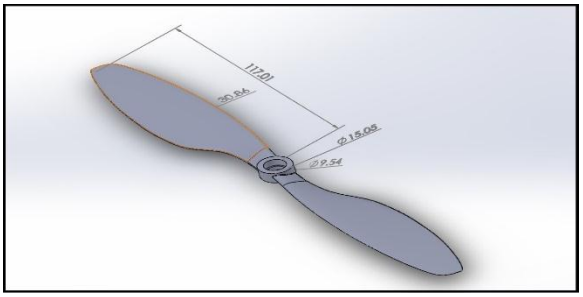


Fig -5: Analysis on scanned file

Conclusion

We got very potential tool for researcher to get complex 3d cad model from physical object. After analysis designer also can make a changes in cad model as per their optimized results findings. Ultimately this is most accurate easiest and fastest way to get 3d cad model for analysis purpose.

REFERENCE

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BIOGRAPHIES

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