VOLUME OF IRREGULAR SYMMETRICAL OBJECTS DESIGNED BY USING EXTENDED UNIFORM CUBIC B-SPLINE AND CUBIC TRIGONOMETRIC POLYNOMIAL B-SPLINE

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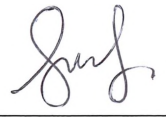
DECLARATION BY CANDIDATE

We certify that this report and the project to which it refers is the product of our own work and that any idea or quotation from the work of other people, published or otherwise are fully acknowledged in accordance with the standard referring practices of the discipline.



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ABSTRACT

In Computer Aided Geometry Design (CAGD), B-splines curves are piecewise polynomial parametric curves that play an important role. CAGD has been widely used which brings good impact of computers to industries in manufacture. In order to engineering requirements, extended cubic B-spline and cubic trigonometric polynomial B-spline are proposed to be implemented in generating new objects. One of the objects that has become a necessity in daily life is bottle. Bottles are classified as a 3-dimensional object which can be designed by using extended cubic B-spline and cubic trigonometric polynomial B-spline. The curves designed are dependent of the shape parameter which can be adjusted. The curves generated are revolved using Sweep Surface Method, hence creating 3-dimensional objects. Every 3-dimensional object has their own volume and this research focused on numerical method such as Trapezoidal for the purpose of computing the volume. Traditionally, manufacturers produced bottles without knowing the exact volume that the bottles can hold. They resorted to a method known as Water Displacement Method to find the volume they desired. However, this process is time-consuming and complicated as it has to undergo trial and error procedure for several times. Based on the volumes obtained in this research, they are compared with the actual volume. The results show that extended cubic B-spline curve with shape parameter 3 is the best method in designing symmetrical irregular objects with a desired volume and the best method in calculating volume of symmetrical objects is a numerical approach, Simpson's 1/3 with subinterval 18.

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