

## A geometric description of human intestine

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### SUMMARY

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Mathematical models of natural phenomena play a central role in the physical sciences. Moreover, modeling of the organs draws from some beautiful areas of mathematics, such as nonlinear dynamics, multiscale transforms and stability analysis.

In this study, a geometric recognition of the separate intestine sections (duodenum, jejunum, ileum, cecum and colon) of the human is presented. The human intestine was considered a tubular shape along a special curve and two male Turkish men were used for the modeling study. The length (cm) and diameter (mm) of the intestines were measured with a digital compass and formulated. These models were compared with their original photographs. It has been concluded that the geometric modeling and experimental work were consistent. These kinds of organ modeling techniques will also profit to medical lecturers to show 3-D figures to their students.

### INTRODUCTION

Computer models not only provide a means to visualize complex morphology derived from two-dimensional tissue outlines, they also permit mathematical modeling of growth or functional attributed. Computerized modeling of anatomical morphologies has become very useful for visualizing complex three-dimensional forms. In computer assisted surgery applications, efficient volume reconstructions of 3D anatomical features are needed. Numerical simulation and prediction can be used to test functional or morphogenetic hypotheses. Problems can arise due to the very complex shape of many structures such as inaccurate modeling and loss of small features. To quantify the quality of the reconstruction, geometrical measurements of the obtained models are made and compared with the original object (Gaunt and Gaunt, 1978; Zou et al., 2003).