

## Creation natural-like geometry of the human's aorta

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A 3-D geometry of human aorta and a mesh were constructed by using a bottom-up approach (in contrast to the top-down approach ). The bottom-up approach means that you will first create some vertices, connect the vertices to create edges, and connect the edges to make, after this stitch the faces together to create volumes. While this process by its very nature requires more steps, the result is a valid geometry that can be used to generate the mesh. The mesh created in this part of work is intended for use in FLUENT. In order to meet this criterion, certain additional steps must be performed in GAMBIT. After creating the vertexes and curves that comprise the geometry, three faces were created: for input section, for output section and side surfaces . However, the Gambit do not have possibilities for creating well-fitting NURBS. In order to create nature-like forms of curves the MATLAB software was used. The algorithm and the code were created. Feature of this software's combination is using the MATLAB's method of data approximation and GAMBIT's possibilities [1] - [3].

- [1] David F Rogers and J. Alan Adams *Mathematical Elements for Computer Graphics.*, McGraw-Hill, Inc., second edition, 1990.
- [2] B. Hahn. D.T. Valentine, *Essential MATLAB for Engineers and Scientists*, McGraw-Hill, Inc., Third edition, 2007.
- [3] Webb S., *The Physics of Medical Imaging*, Institute of Physics Publishing, London.