

Geometrical Model Creation Methods for Human Humerus Bone and Modified Cloverleaf Plate

Rashid, M M., Husain, K. N., Vitković, N., Manić, M., Trajanović, M., Mitković, M.B., Mitković, M. M.
(Faculty of Mechanical Engineering, University of Nis, Nis, Serbia
miki_plast@yahoo.com, husainkarim2014@gmail.com, vitko@masfak.ni.ac.rs, miodrag.manic@masfak.ni.ac.rs,
miroslav.trajanovic@masfak.ni.ac.rs)

Abstract: In the field of orthopaedic surgery, for the treatment of bone fractures orthopaedic surgeons use methods of external and internal fixation, or combination of these two techniques. For the creation of geometrical 3D models of internal fixators and human bones, various computer based methods and technical features are used. These methods include application of computer visualisation techniques like medical imaging, Computer-Aided Design, Finite Element Analysis, etc. This paper introduces newly developed methods for the creation of 3D geometrical models of human humerus bone and modified cloverleaf fixator. The main goal of this research is to create parametric model of the cloverleaf fixator which geometry and shape can be customized to the specific patient, by the application of the parameter values acquired from medical images (X-Ray or Computized Tomography). Such fixator models can greatly improve the pre, intra, and post operative procedures in orthopedic surgery.

Keywords: Computer Graphics, Line and Curve generation, Geometrical Model, Splines, Image Reconstruction, Computer-Aided Design

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