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Accurate and daring research in the field of biomedical engineering and medical diagnostics may open up new horizons

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Most of the completed research in the field of biomedical engineering must be characterized by precision, flexibility and effectiveness, especially as they relate to the lives of human beings with an attempt to approach some of the medical diagnosis process, and this underlines the importance of this research and the feasibility of its application in medical centers. I have been working in one of my studies to reveal the size of tumor in the magnetic resonance images, and the idea of the study came at the request of a competent physician, where expressed his desire to the existence of software to specify the location of the tumor within the patient's head and determine its size in order to facilitate the surgery to remove the tumor, so I have been working on the representation of the tumor inside the head through three 3D models different from each other, after doing the improvement for those slices, segmentation, and post processing. Subsequently, I have been focusing on the fetus inside the womb, the calculation of biometric measurements automatically, depending on the image ultrasound of the head, abdomen and femur, those are very important measurements to give the doctor a comprehensive idea about the status of the embryo in terms of gestational age and weight of the fetus and guess the date of birth, it has been published in many researches in this area and obtained significance through its dealings with ultrasound images which contain high proportions of noise and low contrast, as well as their usefulness in terms of measurements generated and based on eastern standard tables which give better measurement results than ones resulting from European hardware devices (different race), and the possibility of adopting such software in centers run by practicing doctors, reducing the economic cost. Previously, we found the importance of software development interested in the field of biomedical engineering and algorithms while working to share ideas and views to achieve better results help the doctor and facilitate his work without the abolition of his role.

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Effect of wall elasticity on the flow field through stenosis arteries and veins

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This paper is concerned with a numerical study of laminar pulsatile blood flow in elastic and rigid tapered arteries with tapering angles of 0, 0.1, and 0.2 degrees and having stenosis of 0%, 30%, 40% and 50% in the arterial lumen. Newtonian and non-Newtonian blood models flow through elastic artery, in addition to Newtonian blood model flow through rigid artery was considered in this study. The non-Newtonian behavior of blood was described by using cross mode for the shear thinning behavior of the blood. The flow dynamic analysis applies two-dimensional incompressible flow with Reynolds and Womersley numbers of 200 and 1.54 respectively. Navier-stokes equations were written in form of vorticity-stream function and solved by a finite difference technique with necessary initial and boundary conditions in concert with the biophysical point of view using Fortran 90 program. The comparisons between the results considering rigid and elastic arteries showed a decrease in wall shear stress and reduction in pressure drop and less extended separation regions for the elastic artery. The deformation of the arterial wall cannot be neglected while dealing with blood flow studies. The comparison results for the non-Newtonian and the Newtonian fluid flows shows that the non-Newtonian affects weakness in distortion of flow pattern, pressure drop distribution and wall shear stress. Also, the numerical results were compared with previous researches results.

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