

Low Costs Technology Alternative for Diagnosing Scoliosis Utilizing Computerized Technologies

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ABSTRACT

Scoliosis is a sideways curvature of the spine that occurs most often during the growth spurt just before puberty. While scoliosis can be caused by conditions such as cerebral palsy and muscular dystrophy, the cause of most scoliosis is unknown (idiopathic). The detection of scoliosis early is primitive on creating an effective treatment plan for the patient who has it. However, the diagnosis of scoliosis can be challenging based on the severity of the spinal curvature. Patients usually undergo X-ray images so their health care providers can visualize their curvature and proceed to diagnose them, however this can come with some challenging factors in which manual labor is required, and this comes with relative error that will never be an absolute clear diagnosis. The Cobb angle measurement is the standard method used to diagnose the severity of a scoliosis curvature, this approach can be done either manually or by an automated system. Abdullah-Al-Zubaer, et al, 2020, have developed techniques that do not rely on identification of specific vertebra, but rather on measuring segmentation between vertebra relying on Cobb angle estimations. In this research study we performed several Cobb angle measurements utilizing the tool ImageJ for our angle measurements on scoliosis X-ray images to effectively diagnose scoliosis with minimal marginal error compared to control X-ray images previously diagnosed. This method was still cumbersome, and is now working on developing diagnosis through segmental vertebral algorithmic programs.

Keywords: Scoliosis, treatment, diagnosis, Cobb angle, algorithmic programs