

A low-cost alternative for diagnosing scoliosis using computerized technologies

Katarina Costa*, Samantha Thompson*, Amber Thompson*,

Cecilia Vigil**, Megan Lahti**, Kurt Ehlers***

*TMCC High School, **TMCC Department of Biology, ***TMCC Department of Mathematics

Scoliosis is a disorder defined by excessive lateral curvature of the spine. Diagnosis is traditionally accomplished by manually measuring the (Cobb) angle formed by endplates of the most tilted vertebrae on an x-ray of the patient's back. While this is a simple and effective method of diagnosis, it does have disadvantages. Using this method, there are often large variations in measurement between clinicians, patients are exposed to large doses of x-ray radiation in order to obtain images of sufficient resolution, and adequate equipment is not available in some parts of the world. AI programs trained to segment the spine and automate measurement of the Cobb angle have been proposed as a way to reduce measurement error and possibly reduce the need for high dose x-rays. We propose a screening method that will reduce the reliance on x-rays and minimize percent error between users; using markers along the patient's back, locating the spine through palpation, and approximating an angle similar to, but not exactly, the Cobb angle by extracting locations of the markers from a photograph of the patient's back using computer graphic and curve fitting techniques. After validating the implementation of the curve fitting software, our next goal is to build a phone app that can be safely and inexpensively used to screen for scoliosis.