Scoliosis Screening using Self Contained Ultrasound and Neural Networks

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Abstract. We aim to diagnose scoliosis using a self contained ultrasound device that will not require expert operation. The device will detect the angle between the device and the spine using a neural network, and measure the angle between the device and vertical using an off the shelf IMU. The difference between these values will produce a plot of the spine deviation from vertical during the scan, and the extrema of this plot will yield the Cobb angle.

1 Motivation

Currently scoliosis diagnosis and tracking requires either X-Ray imaging, which, while very accurate, involves radiation and is impractical for in school screening, or visual inspection, which requires training, is subjective, and requires an X-ray for confirmation. We hope to replace both of these using a hand-held ultrasound wand.

2 Training Data

Our initial study was conducted on

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