**First-pass report on: “SPINAL CURVATURE MEASUREMENTS BY TRACKED ULTRASOUND SNAPSHOTS” by Ungi et al. in Ultrasound in Med. & Biol. 2014; Vol. 40 (2): 447-54**

1. Category: This paper investigates a clinical protocol for using spatially tracked ultrasound images to quantify scoliosis in terms of the Cobb angle [give brief description of Cobb angle].
2. Context: X-ray imaging remains the gold standard but is undesirable because it requires repeatedly exposing adolescents to ionizing radiation. Optical surface topological measurements are inaccurate and do not allow the spine to be visualized [Goldberg2001]. MRI is a potential alternative to X-ray but is expensive and relatively inaccessible [Difenbach2013]. [Suzuki1989] used regular ultrasound imaging to correlate vertebral rotation with the Cobb angle, but this correlation is weak and disappears once patients have begun treatment [Li2010]. [Purnama2010] demonstrated that 3D volumes can be reconstructed from spatially tracked ultrasound images, and from them, vertebral landmarks extracted to measure spinal deformation. [Chen2011] demonstrated that ultrasound-accessible landmarks can be used as a proxy to the Cobb angle. [Zheng2011] measured scoliosis with ultrasound, but their method required special, wide transducers to capture both sides of the vertebrae simultaneously in an axial orientation. At the time of their writing, no methods for scoliosis quantification have been implemented in clinical practice [Ungi2014]
3. Correctness: As far as I know, the information retrieved from this first pass is correct. I have not followed up on the context through the referenced work, but I’m quite sure the premises are correct. Repeated exposure to ionizing radiation during adolescence presents health risks. Bones are visible in ultrasound, and a 3D image can be constructed with knowledge of the spatial locations of a set of 2D images.
4. Contributions: With no ultrasound based methods being used for scoliosis quantification yet, [Ungi2014] proposes a new method with the hopes that it will be suitable for clinical application.
5. Clarity: The context of the work is presented very well. It would be a challenge to present the relevant work more clearly in list form. It was slightly more difficult to extract the exact contribution of this work, as it is similar to one of the recent studies, differing mainly in the typicality of the hardware used and orientation of the ultrasound probe. That is not to say their contribution did not become apparent with a moment taken to backtrack to the reference to the similar work I mentioned.

I will likely return to this paper for additional information. In addition to my supervisor being an author, it constitutes part of the foundation the work I plan to do; the skeletal landmarks demonstrated to be an accurate proxy to the Cobb angle are those which I intend to use as input to a neural network.

\*\*\*\*\*\* Still must complete part c\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*

**First-pass report on: “A reliability and validity study for Scolioscan: a radiation-free scoliosis assessment system using 3D ultrasound imaging” by Zheng et al. in Scoliosis and Spinal Disorders 2016; Vol 11 (13)**

1. Category: This paper investigates another clinical protocol for quantifying scoliosis specific to the Scoioscan machine.
2. Context: [Zheng2016] refers to the risks associated with repeated exposure to ionizing radiation as well. They refer to [Dechenes2010] and [Al-Aubaidi2013] who assessed the EOS (they do not define the acronym) as a means of reducing radiation exposure for scoliosis measurement, and say that the system will not be practical for some time. [Zheng2016] also refers to surface topological measurements as being too inaccurate for clinical use according to [Goldberg2001] and [Knott2006]. They refer to a number of works which investigate the use ultrasound imaging to locate bony landmarks [Suzuki1989], [Huang2005a], [Huang2005b], [Cheung2010], [Cheng2010], [Purnama2010], [Chen2013], and [Ungi2014]. This paper then refers to two methods of scoliosis quantification, maximum projection intensity [Chen2013] and volume projection imaging [Cheung2015], with which I am unfamiliar. This paper also describes their contribution as an assessment of a method for using ultrasound to quantify scoliosis in a clinical application, in this case, the Scolioscan.
3. Correctness: With this paper being the evaluation of the utility of a machine developed for scoliosis quantification in a clinical setting, it does not make any new claims or assumptions with which I am unfamiliar, much less disagree. Bones are visible in ultrasound, and 3D deformation can be extracted from spatially tracked 2D images.
4. Contributions: The work presented in this paper assessed the reliability of the Scolioscan machine for quantifying scoliosis. This was done by examining the correlation between its measurements and the standard Cobb angle. Inter and intra operator variability were also examined.
5. Clarity: As does [Ungi2014] this paper effectively runs down the list of relevant work in the field in the Background section, making the state of the art clear. Their contribution is then easy to understand, as it is the assessment of this concrete machine. Since none of the listed references worked with this machine, the distinctness of their contribution was immediately apparent.

I will not likely return to this paper because it deals with the Scolioscan, a particular machine to which I do not have access and has no bearing on my project.