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## **\*WITHDRAWN\* – Multi-Modality Comparison of Wrist and Ankle joints: A Feasibility Study**

*Tuesday, 12 June 2018 12:00 (15 minutes)*

A prototype clinical study is being developed to assess pre-adult patients with hemophilic arthropathy. Patients with this condition experience pain in ankle, knee, wrist, or elbow joints due to joint bleeds. Typical ultrasound exams involve probe to skin contact to generate an image, which places a moderate to high level of pain on the effected joint. To overcome the physical touch of an ultrasound probe to the skin, a prototype has been built that consists of a three-dimensional (3D) ultrasound (US) system, and a water filled plastic cylindrical tub. The latter is able to freely rotate about a base plate, while an off-the-shelf electromagnetic encoder, attached to the rotational shaft of the tub, provides the rotational position of the device. Moreover, software running on a Microsoft Windows computer, written by developers at The Robarts Research Institute, takes the encoder position from a USB interface along with conventional two-dimensional (2D) ultrasound images to create a 3D volume. The 2D US images are recorded with a given angular sampling and reconstructed into the 3D volume in an inverse fan geometry. The 3D image is able to provide a viewpoint that is unreachable in conventional 2D ultrasonography, since a manipulation through all planes is possible. Preliminary testing of the device has shown favorable image quality and level of details in two health human wrist and ankle pairs. The prototype design, study protocol workflow, and preliminary results will be presented; specifically showing corresponding anatomical landmarks between 3D ultrasound and MR images. The future work for the study is a clinical trial at Sick Kids hospital in Toronto; whereby, ultrasound / MRI data from each subject will be viewed by two radiologists who are separated from the other aspects of the study. Interpretations from both modalities will gauge the feasibility of this approach for use in imaging hemophilic arthropathy in limb joints.

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