Abstract

Title: Low cost freehand ultrasound scanning based on egomotion estimation

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Keywords: Low-cost, low resource countries, single element transducer, obstetric monitoring.

I. Abstract Body

The feasibility of low cost medical ultrasound imaging based on a free hand scanning of a single, fixed beam transducer has been demonstrated by the supervisor's team with hardware prototypes developed and tested for use in low resource countries. This concept relies on egomotion estimation to enable a B-mode image to be constructed from a series of scan lines (echo data) and some simple algorithms have been applied to date. This project will investigate improved algorithms for egomotion estimation, based on processing of data from low cost microelectromechanical systems (MEMS) gyroscope and accelerometer devices and the ultrasonic echo data itself. Optimum algorithms for image formation given imperfect geometry of either linear or rotational scans will also be developed. Experimental data will be gathered from phantoms with well-defined image patterns for precise measurement of imaging performance parameters such as resolution, contrast and geometric accuracy. Substantial previously collected data from obstetric imaging and other abdominal imaging will be made available for in-vivo validation. A strong emphasis will be placed on computational efficiency of the algorithms developed to enable real time processing on mobile and smartphone devices.

II. Image:



III. Biography:

Ayusha Abbas has completed a first class honors degree in bachelors in electrical and electronic engineering at the age of 22 years from Newcastle University and currently studying PhD degree from Newcastle University.

IV. Presenting author details



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