

Analysis of Ultrasound Backscattered Signals in Cancellous Bones

PROJECT DESCRIPTION

"Osteoporosis is a widespread bone-weakening disease with significant morbidity and mortality affecting over 200 million people throughout the world, especially the elderly and post-menopausal women. In Canada, at least 1 in 3 women will suffer from an osteoporotic fracture during their lifetime. The disease is mainly characterized by bone mass loss, cortical thinning, and microstructural deterioration of bone tissue, subsequently inducing brittle bone. Commercial ultrasound scanners are available to measure ultrasound transmitting through the heel bones using two transducers to extract velocity and attenuation information. The values of these parameters are then compared with those of a data base to provide bone status.

Our research has found that ultrasound backscattered signals, acquired using a single transducer, carries more information about the bone tissues than the transmitted signals. One of the important backscatter parameters to quantify bone quality is the average trabecular spacing, separation between trabeculae. The other parameters also show strong correlation with bone mineral density (BMD). The objective of this project is to analyze the backscattered signals from the volunteer data. Especially, this project is long term collaboration with Fudan University, China. The success of this project will advance our knowledge and technology toward improving disease diagnostics."

FACULTY-DEPARTMENT

Medicine - Radiology & Diagnostic Imaging

DESIRED FIELD OF (STUDENT) STUDY

The candidate should have background in physics, mechanical engineering, biomedical engineering, or similar with experience in MATLAB; knowledge in signal processing; good organization and verbal/writing communication skills in English; last but not the least, good attitude to learn and be flexible with changes in all aspects.

INTERNSHIP LOCATION

University of Alberta Main Campus - Edmonton

NUMBER OF INTERNSHIP POSITIONS

1

INTERNSHIP START DATE

July 4

INTERNSHIP END DATE

3 months after start date

ARE THE DATES FLEXIBLE?

Yes, I am flexible regarding the internship dates. Selected students can contact me to request a date change.