Notice of the Final Oral Examination
for the Degree of Master of Applied Science

of

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BSc (United States Naval Academy, 2011)

“Efficient Sensor Array Subsampling for Plane-Wave Ultrasound Imaging”

Department of Electrical and Computer Engineering

Thursday, April 9, 2020
2:00 P.M.
Remote Defence

Supervisory Committee:
Dr. Daler Rakhmatov, Department of Electrical and Computer Engineering, University of Victoria (Supervisor)
Dr. Mihai Sima, Department of Electrical and Computer Engineering, UVic (Member)

External Examiner:
Dr. Afzal Suleman, Department of Mechanical Engineering, UVic

Chair of Oral Examination:
Dr. Kathryn Gillis, School of Earth and Ocean Sciences, UVic

Dr. David Capson, Dean, Faculty of Graduate Studies
Abstract

Ultrafast plane-wave ultrasound imaging offers very high frame rates (exceeding thousands of frames per second) but entails large volumes of backscattered data collected by sensor array over multiple plane-wave emissions at different angles. We propose a simple method for reducing the total amount of sampled data. First, we acquire the zero angle data in full, and then we perform deterministic subsampling of the remaining nonzero-angle data. Our subsampling patterns are angle-specific and derived based on the zero-angle data using a Fourier-domain migration technique. We use two experimental datasets to evaluate the benefits and drawbacks of our proposed method in terms of spatial resolution and contrast-to-noise ratio, observed in the resulting B-mode images.