

DEVELOPMENT OF DOPPLER PROBE BASED ON FETAL DOPPLER FOR
BONE SONOGRAPHY

By

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BACHELOR'S DEGREE
in

BIOMEDICAL ENGINEERING
LIFE SCIENCES AND TECHNOLOGY



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JULY 2025

STATEMENT BY THE AUTHOR

I hereby declare that this submission is my own work and to the best of my knowledge, it contains no material previously published or written by another person, nor material which to a substantial extent has been accepted for the award of any other degree or diploma at any educational institution, except where due acknowledgement is made in the thesis.



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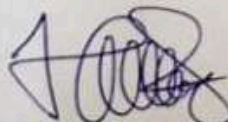
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ABSTRACT

CERAMIC DISC PIEZOELECTRIC CHARACTERISTICS AND OPTIMIZATION IN FETAL DOPPLER PROBE FOR BETTER ACOUSTICS AND POTENTIAL BONE IMAGING

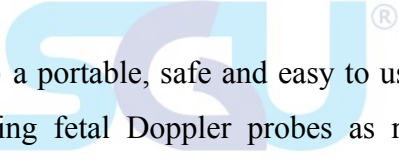
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 This study aims to develop a portable, safe and easy to use bone sonography device through ultrasound. By using fetal Doppler probes as reference, a prototype was developed. The research explores the improvement of conventional ultrasound that are commonly used for soft tissue imaging to be able to target and image bone structures. The development of ultrasound probes capable of bone sonography has significant potential due to the radioactive nature of current bone sonography technologies. Key considerations in the development of the prototype include bone identification and imaging, portability and safety. The prototype was successfully developed using piezoelectric materials as its main sensor and ready to use materials as its supporting structure. The prototype uses Teensy 4.0 as the main controller unit that is connected directly to a computer for live image display. Initial testing shows that the prototype is able to detect and image bones for identification. Additional tests were also performed to verify the accuracy, resolution and reliability of the prototype, which resulted in positive results highlighting the potential of ultrasound for bone sonography.

Keywords: Bone Sonography, Medical Ultrasound, Probe Development, Fetal Doppler.



DEDICATION

In dedication to the advancement of medical imaging, to the professionals innovating
newer heights in bone sonography for doctors and nurses serving in underserved
communities.

May this work contribute to better diagnosis and care for all.



ACKNOWLEDGEMENTS

First and foremost, I thank God Almighty for providing endless guidance and strength. Without His grace, this milestone would have not been achieved. To my mother, I thank you for your unconditional support and love.

I would also like to express my deepest gratitude to all parties that have contributed in completing this research. I would like to express special thanks to Mr. Aulia Iskandar and Mr. Gerald Justin Goenawan, as my advisor and co-advisor respectively, who have given me unyielding support and encouragement throughout the duration of the research as well as study in SGU.

I would also like to thank my friends who kept supporting me in my studies as well as encouraging me to keep on giving my best even through the lows and hardships of the research. Shout to my thesis buddy, Devina, for the drama, laughs and overnight thesis ranting sessions. My biggest appreciation to the people around me who have shown support and offered a listening ear in times of need.

Lastly, I acknowledge all the scholars and authors whose works have contributed to the development of this research.

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