

**RESPIRATORY ASSESSMENT USING CNT MECHANOMYOGRAPHY FOR  
MONITORING BREATHING ACTIVITY AND DEFECTS IN LUNGS DUE TO SARS  
COV-2 VIRUS INFECTION**

By

Daniel Johannes Engel  
11606008

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In

BIOMEDICAL ENGINEERING FACULTY OF LIFE SCIENCES AND TECHNOLOGY



SWISS GERMAN UNIVERSITY  
The Prominence Tower  
Jalan Jalur Sutera Barat No.15 Alam Sutera  
Tangerang, Banten 15143 - Indonesia

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## 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.

Daniel Johannes Engel

Student

14 June 2021

Date

Approved by:

Dr. Dedy H. B. Wicaksono, S.T., M.Eng.

Thesis Advisor

Date

SWISS GERMAN UNIVERSITY

Aulia Arif Iskandar, S.T., M.T.

Thesis Co-Advisor

Date

Dr. Dipl-Ing. Samuel Kusumocahyo

Dean

Date

Daniel Johannes Engel

## ABSTRACT

### RESPIRATORY ASSESSMENT USING MECHANOMYOGRAPHY FOR MONITORING BREATHING ACTIVITY AND DEFECTS IN LUNGS DUE TO SARS COV-2 VIRUS

By:

Daniel Johannes Engel

Dr. Dedy H. B. Wicaksono, S.T., M.Eng., Advisor

Aulia Arif Iskandar, S.T., M.T., Co-Advisor

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Mechanomyography (MMG) is a method for measuring muscle mechanical activity it is often use to monitor muscle for activity of daily living such as sit, stand and walking motion. Other than MMG it has a more well-known alternative, which is Electromyography (EMG). EMG are also used for measuring muscle activity however it measures the electrical potential of the muscle. EMG are well known to be more reliable alternatives to MMG, however EMG are considered too pricy to obtain and most of them are invasive. Hence it come CNT Mechanomyography, an affordable and non-invasive MMG sensor. It is a Thread base coated with multiple carbon nanotube wall and are sewn to kinesiology tape that will attach to the human skin above the muscle. This study aimed to see the muscle activity of breathing activity so it would be possible to monitor recovery state of a COVID-19 patient with a wireless wearable MMG that could be taken home for home monitoring, thus minimizing the risk of virus transmission. The device is consisting of Wheatstone bridge with a digital potentiometer, amplifier, a microcontroller with a Wi-Fi module. The experiment is done while comparing it with a visual base respiratory tracker. By the end of this research, it can be concluded that the MMG could detect the respiratory muscles signals.

*Keywords: mechanomyography, respiration assessment, carbon nanotubes, COVID-19*



## DEDICATION

I dedicate this work to God, my family, my friends, COVID-19 Patient and researchers.



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I found my coursework throughout the biomedical engineering program to be both exciting and inspiring, providing me different tools, working fields problems and ideas to solves.



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