DEVELOPMENT OF BIONIC HAND WITH IMPROVED RELIABILITY AND DEGREE OF FREEDOM

By

Geraldus Aldo
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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.

Geraldus Aldo

Student _____ Date _____

Approved by:

Dr. Eka Budiarto, S.T., M.Sc.

Thesis Advisor _____ Date _____

Leonard P. Rusli, B.Sc., M.Sc, Ph.D.

Thesis Co-Advisor _____ Date _____

Dr. Dipl. -Ing. (FH) Maulahikmah Galinium, S.Kom., M.Sc.

Dean _____ Date _____

ABSTRACT

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By

Geraldus Aldo
Dr. Eka Budiarto, S.T., M.Sc.
Leonard P. Rusli, B.Sc, M.Sc, Ph.D.

SWISS GERMAN UNIVERSITY

Prosthetics have advanced drastically over the past decade. Companies from all over the world, from small start-up companies to one of the largest companies in the field of intelligent prosthetic, have raced each other in making the most advanced but affordable bionic limbs. In the previous work, the design of the prosthetic hand has done by a third party with no specifications of kinematics modelling and three-dimensional design. The extraction of data and conversion of signal into movement of the hand is done by one of the alumni, which turn out to be a success. However this thesis focuses mainly on creating a fitting kinematics model, both forward and inverse, so that the author can manufacture an affordable bionic hand. The product will be 3D-printed and will have an additional joint as an improvement from the previous model. The data processing will be done by a small computer called Raspberry Pi and the program used will come from another colleague who is working on an Artificial Intelligence based data taking and conversion.

Keywords: Advanced Prosthetics, Bionic Hand, 3D Printing, Mathematical Modelling, Forward and Inverse Kinematics, Raspberry Pi, Artificial Intelligence.

DEDICATION

I dedicate this work for God, my family and friends who never failed to believe in me, the future of amputees and the sake of the future of my country, Indonesia.

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My life is not perfect, but each step that I took has brought me to a whole new level and I am thankful for everything I have without ever regretting a single thing.

Geraldus Aldo

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