

DEVELOPMENT OF BIONIC HAND WITH IMPROVED RELIABILITY AND DEGREE OF  
FREEDOM

By

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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.

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## ABSTRACT

### DEVELOPMENT OF BIONIC HAND WITH IMPROVED RELIABILITY AND DEGREE OF FREEDOM

By

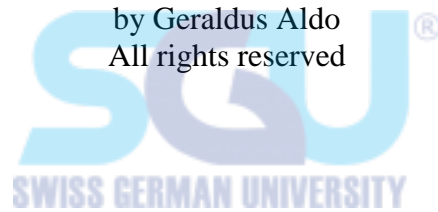
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Prosthetics have advanced drastically over the past decade. Companies from all over the world, from small start-up companies to one of the largest companies in the field of intelligent prosthetic, have raced each other in making the most advanced but 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.*

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## 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.



## ACKNOWLEDGEMENTS

First and foremost, I want to express my gratitude to the one and only God Himself, as he never fails to give me His blessings and guidance in each and every day.

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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.*

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