

**DEVELOPMENT OF ROBOT-BASED SMART WALKING STICK FOR
BLIND AND VISUALLY IMPAIRED PERSONS**

By

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in

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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 acknowledgment is made in the thesis.



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ABSTRACT

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The research focuses on developing a robot-based smart walking stick, which is developed as an alternative and replacement for the existing navigation aids and as a development from other smart sticks previously developed by researchers, which lack sensors to detect holes in front of the smart walking stick.

The smart walking stick is designed with the chassis housing the microcontroller. The sensors used, with the stick acting as the interface between the user and the robot part of the smart walking stick. The smart walking stick is demonstrated to determine that the smart walking stick is capable of detecting objects around the user and the smart walking stick, and also detecting gaps and holes, which is done to prevent injuries to the user, which is caused by falling. From each test done on each component and on the assembled chassis, the research proves that the smart walking stick is capable of detecting an obstacle around the user and the robot and the gaps below the smart walking stick, which the smart walking stick responded to the obstacles and the gaps according to the programmed command, although

adjustments on the distance for object detection is needed for utilization indoors and outdoors.

Keywords: Smart walking stick, Ultrasonic Sensors, Robot

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DEDICATION

I dedicate this work to my home country, Indonesia, where I hope this thesis serves well in advancing knowledge, to my family, as proof that their son graduated from the university, and to Swiss German University, where I learned many things, for which I am grateful.

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