ODOR LOCALIZATION USING A MOBILE ROBOT

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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

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When a potentially hazardous gas leakage is present in an environment, it may be dangerous for humans to localize the source of leakage. Therefore, the objective of this thesis work is to develop a mobile robot capable of localizing odor. To simulate an odor source, ethanol is used. Ethanol gas sensor is utilized to detect ethanol vapor. Analysis of ethanol gas sensor is described in detail in order to find the correct configuration and strategy in locating odor source. The mobile robot would proceed towards the highest concentration of ethanol vapor. The odor sensor is tin oxide type, which is high in response but the drawback was the recovery time. Localization method used is *E.coli* algorithm. The fact that the odor sensor is not equipped with wind sensor, it faced some challenges to detect odor source efficiently. Recommendation of further work would be to add fans that would aid in lowering the recovery time. In addition to that, attaching wind sensors would increase its successive rate in localizing odor and other localization strategies could be implemented.

Keyword: odor, localization, mobile robot, ethanol, E. coli.

DEDICATION

This thesis is dedicated to Allah SWT for His never-ending blessings and to my family for their never-ending love and support.

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