Boat Recognition and Automated Harbor Management System

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Declaration

I declare that this thesis is my work and has not been submitted in any form for another degree or diploma at any university or other institution of tertiary education. Information derived from the published or unpublished work of others has been acknowledged in the text and a list of references is given.

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W.D.L.S.Weerasekara ….……..……

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Supervised by:

Name of Supervisor Signature of Supervisor

Dr. S.C.Premaratne ….……..……

Date:

Dedication

This research is dedicated to all the energetic people who dedicate their lives for the upliftment of the fisheries industry.

Acknowledgement

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Abstract

Fisheries industry is a vital sector of Sri Lanka's economy since it is an island surrounded by a vast ocean. Over thousands of fishing vessels are departing to the ocean within a day from harbors all around the island. All the departing and arriving fishing vessels should have gone though an ample security check by the harbor authorities one by one. But with the COVID 19 pandemic situation and the social distancing procedure, harbor authorities are facing difficulties to detect and recognize fishing vessels by getting on the boats as before the pandemic situation. Also, currently harbors are using a manual, paper-based system for recording the information on boat departures and arrivals. This leads to the inefficiency of harbor management process, delays in rescue missions and failures of security missions. To solve these problems, this paper introduces a Boat Recognition and Automated Harbor Management System (BRAHMS) which is based on YOLO(You Only Look Once) v5 algorithm. A web-based solution is provided to manage fishing boat tracking information as one deliverable of the project. Also, YOLO based desktop applicationto recognize boats through the registered number is given as another outcome. Final deliverable is a backend reporting solution to send boat tracking information according to daily, weekly, monthly or yearly preschedule intervals. In this system, I have implemented a novel deskewing method for the slanted license plate recognition process. The deskewing process is aimed for three main approaches as auto deskewing, manual deskewing and a hybrid deskewing which uses both auto and manual processes together.

Keywords: Fishing Vessels, Fisheries industry, YOLOv5, Boat recognition, License plate recognition, image processing, license plate deskewing

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