Department of Electrical and Computer Engineering
North South University

Senior Design Project

An economic and automatic water quality monitoring system in the light of industry 4.0

Abrar Zuhaer Tariq **ID # 1431152043**

Faculty Advisor

Dr. Mohammad Monirujjaman Khan

Associate Professor

ECE Department

Spring, 2022

DECLARATION

This is to certify that this Project is my original work. No part of this work has been submitted elsewhere partially or fully for the award of any other degree or diploma. Any material reproduced in this project has been properly acknowledged.

Students' name & Signature

1. **Abrar Zuhaer**

APPROVAL

The capstone project entitled "**An economic and automatic water quality monitoring system in the light of industry 4.0**" by **Abrar Zuhaer (ID#1431152043** is approved in partial fulfillment of the requirement of the Degree of Bachelor of Science in Electronics and Electrical Engineering on May and has been accepted as satisfactory.

Supervisor's Signature

Dr. Mohammad Monirujjaman Khan

Associate Professor
Department of Electrical and Computer Engineering
North South University
Dhaka, Bangladesh.

Department Chair's Signature

Dr. Rajesh Palit
Professor
Department of Electrical and Computer Engineering
North South University
Dhaka, Bangladesh.

ACKNOWLEDGMENT

First of all, I wish to express my gratitude to the Almighty Allah for blessing me to vision this project to work on it.

The capstone project program is very helpful to bridge the gap between the theoretical knowledge and real life experience as part of Bachelor of Science (BSc) program. This report has been designed to have a practical experience through the theoretical understanding.

I also acknowledge our profound sense of gratitude to all the teachers who have been instrumental for providing us the technical knowledge and moral support to complete the project with full understanding.

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We thank our friends and family for their moral support to carve out this project and always offer their support.

ABSTRACT

Water quality monitoring is significant for sustainable aquaculture. It helps to reduce the risk of unwanted fish loss due to poor water quality, as a result, farmers can maximize profit. DO, Ammonia, pH, Temperature, Turbidity and TDS are the key parameters and their correct level in water ensures favourable conditions for aquaculture. However, in the aquaculture industry, DO and ammonia measurement with digital systems are costly. Eventually, it is inevitable for the aquaculture farmers to measure the other parameters (pH, Temperature, Turbidity and TDS) by the side of DO, Ammonia. Therefore, we have developed a system in the light of industry 4.0 with the aid of IoT that can monitor automatically the above-mentioned water quality parameters without human involvement and keep the users updated remotely with the help of an android app. The system is expected to achieve more than 98% accuracy in DO tests and nearly 99+% accuracy in ammonia measurement in water. Other parameter readings like temperature, turbidity, and PH have produced a high precision result as modern sensors are used. Our study shows that the developed system can cut down the overall cost (accusation and test) by approximately 85% and it will open a new door of opportunity for aquaculture automation. DO, Ammonia, PH, Temperature, Turbidity and TDS