

# Senior Design Project



## NORTH SOUTH UNIVERSITY

### DEPARTMENT OF ELECTRICAL AND COMPUTER ENGINEERING

#### NAME OF PROJECT:

**MULTI\_TASKING AUTONOMOUS DEVICE**

#### Supervisor:

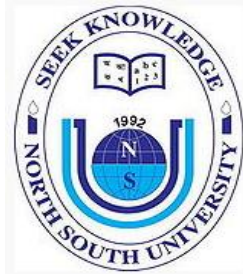
**Mr. Abu Obaidah (AbO)**

**Lecturer of Department of ECE**

#### Submitted By:

<b>Group-3</b>		
<b>Member</b>	<b>ID</b>	<b>Name</b>
1	1911226043	Jubair Ibn Omar Hamza
2	1911622043	Sartaj Mahmud
3	1912325643	Shakil Khan
4	1911994043	Abdullah Al Mahfuz
5	1911075043	Nazifa Syed Aasfi

**Summer 2023**



**NORTH SOUTH UNIVERSITY**  
**DEPARTMENT OF ELECTRICAL AND COMPUTER**  
**ENGINEERING**

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**MULTI\_TASKING AUTONOMOUS DEVICE**

**Supervisor:**  
**Mr. Abu Obaidah (AbO)**  
**Lecturer of Department of ECE**  
**North South University**

**EEE499B**

**Section-15**

**Group-3**

**Submitted By**

[1911226043 Jubair Ibn Omar Hamza]

[1911622043 Sartaj Mahmud]

[1912325643 Shakil Khan]

[1911994043 Abdullah Al Mahfuz ]

[1911075043 Nazifa Syed Aasfi]

**Date of Submission: 25.06.2023**

# LETTER OF TRANSMITTAL

June 25, 2023

To

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

Subject: Submission of Capstone Project Report on “**Multi-Tasking Autonomous Device**”

Dear Sir,

With due respect, we would like to submit our **Capstone Project Report** on “**Multi-Tasking Autonomous Device**” as a part of our BSc program. The report deals with Multi-Taking Autonomous Device. This project was very much valuable to us as it helped us gain experience from practical field and apply in real life. We tried to the maximum competence to meet all the dimensions required from this report.

We will be highly obliged if you kindly receive this report and provide your valuable judgment. It would be our immense pleasure if you find this report useful and informative to have an apparent perspective on the issue.

Sincerely Yours,

.....  
Jubair Ibn Omar Hamza  
ECE Department  
North South University, Bangladesh

.....  
Sartaj Mahmud  
ECE Department  
North South University, Bangladesh

.....  
Abdullah Al Mahfuz  
ECE Department  
North South University, Bangladesh

.....  
Shakil Khan  
ECE Department  
North South University, Bangladesh

.....  
Nazifa Syed Aasfi  
ECE Department  
North South University, Bangladesh

# APPROVAL

Jubair Ibn Omar Hamza (1911226043), Sartaj Mahmud (1911622043), Abdullah Al Mahfuz (1911994043), Nazifa Syed Aasfi (1911075043) and Shakil Khan (1912325643) from Electrical and Computer Engineering Department of North South University, have worked on the Senior Design Project titled “Multi-Tasking Autonomous Device” under the supervision of Mr. Abu Obaidah partial fulfillment of the requirement for the degree of Bachelors of Science in Engineering and has been accepted as satisfactory.

## Supervisor’s Signature

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**Mr. Abu Obaidah**

Senior Lecturer

Department of Electrical and Computer Engineering

North South University

Dhaka, Bangladesh.

## Chairman’s Signature

.....

**Dr. Rajesh Palit**

**Professor**

Department of Electrical and Computer Engineering

North South University

Dhaka, Bangladesh.

# DECLARATION

This is to declare that this project is our original work. No part of this work has been submitted elsewhere partially or fully for the award of any other degree or diploma. All project related information will remain confidential and shall not be disclosed without the formal consent of the project supervisor. Relevant previous works presented in this report have been properly acknowledged and cited. The plagiarism policy, as stated by the supervisor, has been maintained.

Students' names & Signatures

.....  
Jubair Ibn Omar Hamza

.....  
Sartaj Mahmud

.....  
Abdullah Al Mahfuz

.....  
Shakil Khan

.....  
Nazifa Syed Aasfi

## **ACKNOWLEDGEMENTS**

We would like to express their heartfelt gratitude towards their project and research supervisor, Mr. Abu Obadiah, Senior Lecturer, Department of Electrical and Computer Engineering, North South University, Bangladesh, for his invaluable support, precise guidance and advice pertaining to the experiments, research and theoretical studies carried out during the course of the current project and also in the preparation of the current report.

Furthermore, we would like to thank the Department of Electrical and Computer Engineering, North South University, Bangladesh for facilitating the research. We would also like to thank our friends Shuvo for helping us in this project. We would also like to thank their loved ones for their countless sacrifices and continual support.

# **ABSTRACT**

## **Multi-Tasking Autonomous Device**

ROBOTICS is a rapidly emerging and fascinating field in today's world. With the pandemic, sanitation and sterilization are now intricately intertwined in our daily lives. The interest in self and automated cleaning, sanitizing and disinfecting devices has been accelerated by swift development of a germ-conscious mentality among the general populous due to the pandemic. In order to accommodate those demands, this paper has been proposed to design a robust, effective, and efficient autonomous multi-tasking device with the ability to detect and avoid object and switch off while in proximity to human motion. The device is designed to operate in enclosed spaces, offering a range of integrated functionalities to enhance efficiency, safety, and convenience. It combines advanced hardware components, intelligent software algorithms, and innovative features such as obstacle detection, vacuum cleaning, fire alarm system, UV disinfection, light and temperature readings, biometric authentication, and surveillance capabilities. By seamlessly integrating these functionalities into a single device, we aim to transform the way we interact with our environments, optimizing productivity, security, and comfort. Our multi-tasking autonomous device represents a significant advancement in smart environments, offering a comprehensive solution for intelligent automation and environmental monitoring.