



SENIOR DESIGN PROJECT

**HOME AUTOMATION SYSTEM USING
BRAIN WAVE**

Research Members

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Supervisor

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Fall, 2018

LETTER OF TRANSMITTAL

2nd January, 2019

To,
The Chairman,
Department of Electrical and Computer Engineering,
North South University.
Dhaka, Bangladesh.

Subject: Submission of Capstone Project on “Home Automation Using Brain Wave”.

Dear Sir,

With due respect, we would like to submit our **Capstone Project Report** on “**Home Automation Using Brain Wave**” as a part of our BSc program. The report deals with Home Automation base EEG System. This project was very much valuable to us as it helped us gain experience from the 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,

Mahmudur Khan Tanzid
.....
ECE Department
North South University, Bangladesh

Saima Islam
.....
ECE Department
North South University, Bangladesh

Zobayda Hossan Arshie
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ECE Department
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Shahedur Rahman
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ECE Department
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DECLARATION

This is to certify 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. Any material reproduced in this project has been properly acknowledged.

Signature & Date

1. Mahmudur Khan Tanzid

2. Zobayda Hossan Arshie

3. Saima Islam

4. Shahedur Rahman

APPROVAL

The capstone project entitled “**Home Automation System Using Brain Wave**” by **Mahmudur Khan Tanzid, Zobayda Hossan Arshie, Saima Islam and Shahedur Rahman** is approved in partial fulfillment of the requirement of the Degree of Bachelor of Science in Electrical & Computer Science Engineering has been accepted as satisfactory.

Department Chair’s Signature

Supervisor’s Signature

Dr. Shazzad Hosain

Associate Professor

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Dr. Mohammad Monirujjaman Khan

Assistant Professor

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Dhaka, Bangladesh.

ACKNOWLEDGMENT

First of all, we wish to express our gratitude to the Almighty for giving us the strength to perform our responsibilities and complete the report.

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

We 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.

It is imperative to show our appreciation for our honorable faculty member Dr. Mohammad Monirujjaman Khan for his undivided attention and help to achieve this milestone. Also, our gratefulness is divine to the North South University, ECE department for providing us a course such as EEE 499 in which we could really work on this project and materialize it the way we have visioned.

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

ABSTRACT

Brain-computer interface (BCI) is a communication pathway between the brain and the external peripheral devices like computers. We propose to use this technology for Home automation. Home automation can be totally revolutionized using BCI. The brain produces various types of waves like alpha (9-13Hz), beta (14-30Hz), theta (4- 8Hz), delta (1-3Hz). Using these waves we can control various home appliances. The entire concept consists of 4 main stages of detection, amplification, processing, output. First detecting the brain signals using an EEG cap or electrodes. These brain signals are very weak hence in the second stage we need to amplify these brain signals to a usable amount and filter these to remove noise. Then thirdly, we will have to convert these signals into digital by using A to D converter and into a type, a computer software or a microcontroller can understand. Fourth, taking this decoded signal and sending these signals wirelessly, by using an RF circuit to a distant switch circuit, which will turn on or off the appliance in the vicinity. Using this technology, the life of people would be further simplified, physical efforts would be considerably reduced and it would also prove as a boon for physically disabled people.