

**VISVESVARAYA TECHNOLOGICAL UNIVERSITY**

**“Jnana Sangama” Belagavi – 590010**



**PROJECT REPORT ON**  
**“Brain-Computer Interface with Image Display”**

**Submitted in partial fulfillment of the requirements for the award of degree**

**BACHELOR OF ENGINEERING**  
**IN**  
**ELECTRONICS & COMMUNICATION ENGINEERING**

**Submitted By**

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**DEPARTMENT OF ELECTRONICS & COMMUNICATION ENGINEERING**  
**ALVA'S INSTITUTE OF ENGINEERING & TECHNOLOGY**  
**MOODBIDRI – 574 225.**

**2017-2018**

# ALVA'S INSTITUTE OF ENGINEERING & TECHNOLOGY

MOODBIDRI – 574 225

(Affiliated to VTU, BELAGAVI)

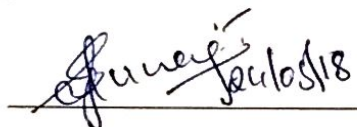
DEPARTMENT OF ELECTRONICS & COMMUNICATION ENGINEERING

## CERTIFICATE

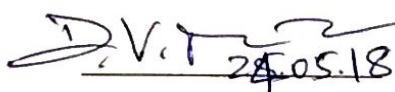
Certified that the Project work entitled **“Brain-Computer Interface with Image Display”** is a bona fide work carried out by

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in partial fulfillment for the award of BACHELOR of ENGINEERING in ELECTRONICS & COMMUNICATION ENGINEERING of the VISVESVARAYA TECHNOLOGICAL UNIVERSITY, BELAGAVI during the year 2017–2018. It is certified that all corrections/suggestions indicated for internal assessment have been incorporated in the report deposited in the departmental library. The project report has been approved as it satisfies the academic requirements in respect of project work prescribed for the Bachelor of Engineering degree.



Signature of the Guide  
Mr. Yuvaraj T



Signature of the H.O.D  
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Signature of the Principal  
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### EXTERNAL VIVA

Name of the Examiners

Signature with date

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## ABSTRACT

BCI is a leading technology in today's world. In simple words, it creates an interface between the brain and the machine, allowing the machine to send commands to the machine directly from the CNS and especially the brain. Great popularity of the Arduino microcontroller board helps to integrate BCI comprising neurosky mindwave mobile with Arduino microcontroller board. The main use of this technology is in the field of medical science. Works are being done in the field of military and skill improvement domains as well. This technology is growing day by day and is proving to be one of the most important technologies in the current scenario. This project shows how BCI works and how it can be used in certain applications. EEG was used to read brain waves and then those waves were analyzed to fetch fruitful results which are used in certain applications.

BCIs can use noninvasive or invasive methods for recording the brain signals that convey the user's commands. Whereas noninvasive BCIs are already in use for simple applications, it has been widely assumed that only invasive BCIs, which use electrodes implanted in the brain, can provide multidimensional movement control of a robotic arm or a neuroprosthesis. The adaptive algorithm used in this noninvasive BCI identifies and focuses on the electroencephalographic features that the person is best able to control and encourages further improvement in that control. The results suggest that people with severe motor disabilities could use brain signals to operate a robotic arm or a neuroprosthesis without needing to have electrodes implanted in their brains.