FINAL YEAR PROJECT REPORT

BRAIN-COMPUTER INTERFACE (BCI)-CONTROLLED UNMANNED AERIAL VEHICLE (UAV)

In fulfillment of the requirement
For degree of
BS (COMPUTER SCIENCES)

By

SYED YOUSUF NABEEL SHAH	48378 BSCS
MOAZ QAMAR	48882 BSCS
MUHAMMAD WAQAR AFZAL	48910 BSCS

SUPERVISED

BY

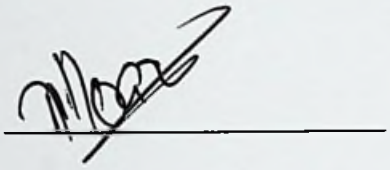
MR. BILAL MUHAMMAD IQBAL

BAHRIA UNIVERSITY (KARACHI CAMPUS)

FALL-2020

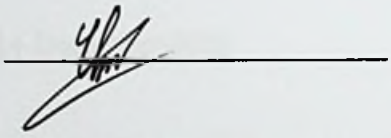
DECLARATION

We hereby declare that this project report is based on our original work except for citations and quotations which have been duly acknowledged. We also declare that it has not been previously and concurrently submitted for any other degree or award at Bahria University or other institutions.

Signature : 

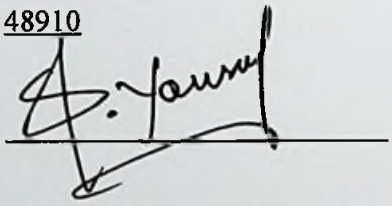
Name : Moaz Qamar

Reg No. : 48882

Signature : 

Name : Muhammad Waqar Afzal

Reg No. : 48910

Signature : 

Name : Syed Yousuf Nabeel Shah

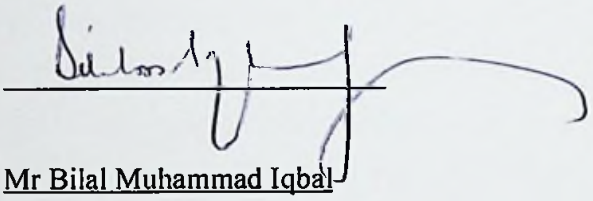
Reg No. : 48378

Date : 14-Demeber-2020

APPROVAL FOR SUBMISSION

I certify that this project report entitled **"BRAIN–COMPUTER INTERFACE (BCI)-CONTROLLED UNMANNED AERIAL VEHICLE (UAV)"** was prepared by **MOAZ QAMAR, MUHAMMAD WAQAR AFZAL, SYED YOUSUF NABEEL SHAH** has met the required standard for submission in partial fulfilment of the requirements for the award of Bachelor of Computer Science (Honours) at Bahria University.

Approved by,

Signature : 

Supervisor : Mr Bilal Muhammad Iqbal

Date : 14-December-2020

BRAIN–COMPUTER INTERFACE (BCI)-CONTROLLED UNMANNED AERIAL VEHICLE (UAV)

ABSTRACT

Brain-computer interfacing (BCI) is a technology that is almost four decades old and it was developed solely for the purpose of developing and enhancing the impact of Neuroprosthetics. As the non-invasive EEG headsets are made and used for commercialization there are lot of application has seen such as home automation, wheelchair control, controlling vehicle steering etc.

Controlling the drone with brain is one the latest application developed with the help of BCI. These applications, however, do not require a very high-speed response and give satisfactory results when standard classification methods like Support Vector Machine (SVM) and Multi-Layer Perceptron (MLPC). Issues are raised when there is a high-speed control requirement for fixed-wing unmanned aerial operation. Vehicles where such methods are kept unstable due to the low rate of classification. Such an application requires the system to classify data at high speeds in order to retain the controllability of the vehicle. This paper proposes a novel method of classification which uses a combination of Common Spatial Paradigm and Linear Discriminant Analysis that provides an improved classification accuracy in real time. A non-linear SVM based classification technique has also been discussed. Further, this paper discusses the implementation of the proposed method on a fixed-wing and VTOL unmanned aerial vehicles.

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