VIVEKANAND COLLEGE, KOLHAPUR

(Empowered Autonomous)

SEED MONEY SCHEME FOR RESEARCH

Annual/Final Report of the work done on the Research Project

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1) Project report No. - First

2) VCK Reference No. - VCK/2022-23

3) Period of report : from - 01 /11/2022 to 31/10/2023

4) Title of research project - Real time Sleepiness or fatigue detection using Eye Aspect Ratio (EAR)

5) a) Name of the Principal Investigator - Dr. Milind Shamrao Patil

b) Dept. And College where work has progressed – Dept. of Electronics, Vivekanand College (Empowered Autonomous) , Kolhapur.

6) Effective date of starting of the project - 01 /11/2022

7) Grant approved and expenditure incurred during the period of the report:

a. Total amount approved Rs. 1,37,000/-

b. Total expenditure Rs. 12,000/-

c. Report of the work done:

1.	Brief Objective of the Project	Annexure -A
2.	Work done so far and results achieved and publications, if any, resulting from the work (Give details of the papers and names of the journals in which it has been published or accepted for publications)	Annexure -A
3.	Has the progress been according to original plan of work and towards achieving the objective, if not state reasons?	Yes
4.	Please indicate the difficulties, if any, experienced in implementing the project.	--
5.	If project has not been completed, please indicate the approximate time by which it is	Ongoing

	likely to be completed. A summary of the work done for the period (Annual basis) may please be sent to the university on a separate sheet.	
6.	If the project has been completed, please enclose a summary of the findings of the study. Two bound copies of the final report of work done may also be sent to the University	--
7.	Any other information which would help in evaluation of work done on the project. At the completion of the project, the first report should indicate the output, such as a) Manpower trained b) Ph. D awarded c) Publication of results d) other impact, if any.	--

Signature of the Principal Investigator

Signature of the Principal

PRINCIPAL
VIVEKANAND COLLEGE, KOLHAPUR
(EMPOWERED AUTONOMOUS)

Annexure –A

Report on Work Done:

- ✓ **Title of research project:**

  "Real time Sleepiness or fatigue detection using Eye Aspect Ratio (EAR)"

- ✓ **Objective of research project:**

  -To develop a system that will detect fatigue by performing live monitoring of Eye Aspect Ratio with the help of imaging device.

  -To give alert to avoid accidents.

- ✓ **Work done as far and results achieved and publications:**

  -***Literature review*** is done of the related work done.
  The survey is done to comprehend the need and prerequisite of the general population, and to do as such, we went through different sites and looked for the fundamental data. Based on these data, we made an audit that helped us get new thoughts and make different arrangements for our task. We reached the decision that there is a need of such application and felt that there is a decent extent of progress in this field too. The literature review of proposed project is studied through previous researchers work.

  -Working on the ***electronics hardware*** design.
  Raspberry Pi Single Board Computer (SBC) is main heart of project. Wbcam is used to feed the video.

  -Working on ***software*** design.
  In this proposed project first the video preview is started using a webcam. The camera will be positioned in front of the driver to capture the front face image. From which, the frames are extracted to obtain two dimensional images. Face is detected in the frame. After detecting the face, facial landmarks like positions of eye, nose, and mouth are marked on the images. From the facial landmarks, eye aspect ratio is quantified and using these features and machine learning

approach, a decision is obtained about the drowsiness of the driver. If drowsiness is detected, an alarm will be sent to the driver to alert him/her.

Python language: Python is the basis of the program that we wrote. It utilizes many of the python libraries.

Libraries:

- Numpy: Pre-requisite for Dlib
- Scipy: Used for calculating Euclidean distance between the eyelids.
- Playsound: Used for sounding the alarm
- Dlib: This program is used to find the frontal human face and estimate its pose using 68 face landmarks.
- Imutils: Convenient functions written for Opencv.
- Opencv: Used to get the video stream from the webcam, etc.

Operating System (OS): Program is test on Raspbian OS on Raspberry Pi Single Board Computer.

-Publication work is in process.

Signature of the Principal Investigator MSPatil

(Dr. milind s. Patil)