

SRI VENKATESWARA COLLEGE OF ENGINEERING (Autonomous)
INSTITUTION INNOVATION COUNCIL (IIC)
IDEA COMPETITION-APPLICATION FORM

Name of the Student	Rahul RK, Sairamnath K, Shantha Kumar
Branch	Information Technology
Year /Semester	3 rd year – 6 th semester
Section	B
Roll.No	74, 81, 88
Register No	170801074, 170801081, 170801088
Any other Camp attended related to Innovation/Entrepreneurship/Incubation	Entrepreneurship Awareness Camp by Entrepreneurship Promotion and Incubation Center EPIC, TNSI 2018 - Awareness Program - Anna University Chennai, Social Entrepreneurship Camp by Rajiv Gandhi National Institute of Youth Development
Idea Competition – Mention the Theme (Please refer the circular, for more details)	Artificial Intelligence and Machine Learning
Field trips attended related to the theme.	Yes
If Yes. Mention the Name of the Organization with Address	Infoziant IT Solutions, Chennai Rajiv Gandhi National Institute of Youth Development, Sriperumbudur
Mentor (if any) Name and Designation	Mrs. Sharon Femi Assistant Professor
Student Name with Signature	
Department IIC Coordinator Name with Signature	

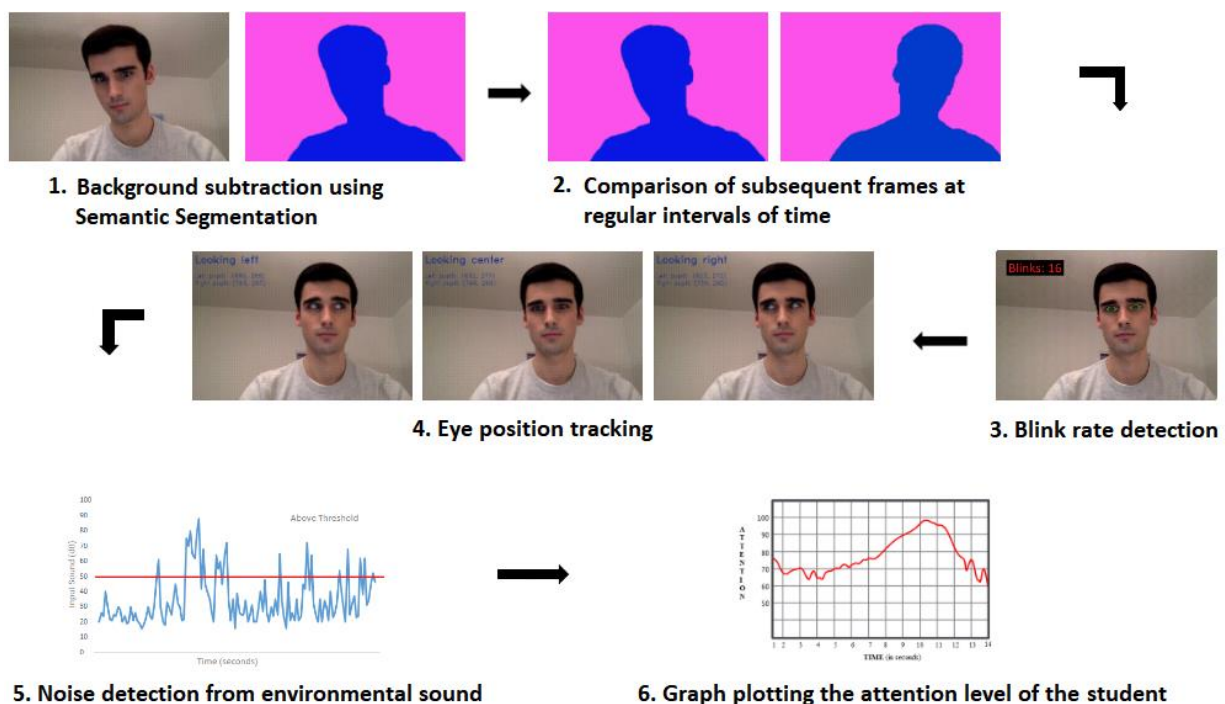
Novelty of Idea / Innovation

The main objective of this application is to monitor the attention level of students in an online seminar and provide real time feedback about attention level to the lecturer and students. This application is developed for the learner i.e. the student to analyze their understanding and improve based on the feedback. This application uses Machine Learning and image processing techniques such as eye tracking, blink rate, facial expression detection using haar cascade classifier, etc. to map the user's selective attentiveness. Subsequent frames with an interval of 3 seconds will be processed in real time to determine the change in position of the user. This application also uses the microphone in the user's device to find the noise level in the background, if the noise of the environment is greater than the threshold level the user is in a disturbing environment. Python libraries like port audio can be used to find the ports in which audio is playing. The conversation is a two way dialogue if the audio is sent through the user's

microphone. The total time of two way dialogue is calculated. A real time graph is plotted containing key parameters like blink rate, noise level throughout the session, ratio of two way dialogue to the entire session and attention level of each user will be displayed to the lecturer for further analysis.

Methodology

1. The video from the user's webcam is processed and semantic segmentation is applied to subtract the background from the user.
2. Subsequent frames are compared with an interval of 3 seconds and the change in position of user is determined.
3. Blink rate of the user is calculated using the Haar cascade classifier.
4. Eye position of the user is tracked using tools like PyGaze and GazeTracking and is used to detect whether the user is distracted during the seminar. If the user is distracted for more than a particular time, a warning is given and focus mode is turned on. i.e, All contents on the page except the seminar video will be blacked out.
5. The user environment's sound (in decibels) is measured from the microphone and if it is more than a certain threshold value, it can be concluded that the user's environment is noisy and can affect his/her attention level.
6. Python libraries like portaudio can be used to monitor the audio ports and detect the port (microphone or speaker) from which the audio signal is coming. This can be used to determine whether the conversation is one way or two way.
7. Using all the above parameters, the attention level of each candidate is calculated and a real time graph is plotted. Average attention level is displayed at the end of the seminar.



Societal impact

Our project helps to monitor the attention level of students in online seminar lectures and provide appropriate feedback to the individual student/lecturer in order to improve the quality of online education worldwide. Students can be graded based on their attention level and thus we can produce better results. Students who attend the online courses just for the sake of certificates without even paying attention to the lectures can be warned based on their attention level. The actual knowledge transfer ratio can be increased. This will help young aspirants improve their knowledge and this ultimately result in a better society.

Market potential

According to a research conducted by businesswire, it is estimated that by 2021, the online education market's value would be worth around 2 Billion USD. Detecting attention span of each individual on an online seminar and providing analytics in real-time can totally change the grading system. Many online education companies such as Coursera, Udacity, Great Learning, etc will get benefited from this application. Artificial Intelligence can play a key role in online education sector and will have exponential growth in the near future. It is the need of the hour.

HOD Signature with Date