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Secure Online Assessment for Professional Misconduct

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ABSTRACT—The deadly COVID-19 has changed everyone's lifestyle, resulting in a worst-case pandemic situation. It had an impact on education and business, requiring all assessments to be conducted online, which resulted in a slew of errors. Examinations are being conducted online due to COVID-19 pandemic. We require software during online exam to detect malpractices. In this project, we had designed and implemented a system to monitor student activities on a desktop/laptops or mobile devices. If a student is caught copying content from other sources in desktop or mobile, our system will detect it and notify to the online examiner. We will record the student activities for the online exam using the webcam attached to the desktop. The primary goal of the project is to create a very strong face recognition algorithm that analyses multiple people in real time recording scenes while taking an exam, in addition to developing an algorithm to detect audio, head pose, and object detection.

I. INTRODUCTION

For the past few years, E-Learning has become popular across countries because of its flexibility, availability and user friendliness. As far as online examinations are concerned; the major challenge faced by the research community is the proctoring techniques used. By continuously analysing the user attention level, as a system for determining the quality of courses, an automated system is essential to handle the proctoring difficulty.

Online examination or assessment is one of the key areas of education technology. Online examination usage is likely going increase for various types of examinations and competitive entrance tests, recruitment tests. Online assessment has proved to be cost effective and better way to filter out and identify suitable candidates.

Security is one of the key areas of online assessment which still needs some improvements. Secure online assessment can be useful to prevent all kinds of malpractices tried by the candidates during online exam process.

Even with several measures in place like the novel method proposed to invigilate the students electronically during examination at remote locations, chances for high rate of fraud in the online examinations makes monitoring harder.

II. PROPOSED METHODOLOGY

In this work, we aim to develop a multimedia analysis system to detect a wide variety of cheating behaviors during an online examination. Our proposed online exam process includes two phases, the preparation phase and exam phase. In the preparation phase, the test taker has to authenticate himself before beginning the exam, by using a password and face authentication. This phase also includes calibration steps to ensure that all sensors are connected and functioning properly.

In exam phase, the test taker takes the exam, under the continuous "monitoring" of our OEP system for real-time cheating behavior detection. We use three sensors (webcam, wear cam and microphone) to capture audio-visual cues of the examination environment and the test taker. The sensed data is first processed using six components to extract middle-level features. These components are: user verification, text detection, speech detection, active window change detection, gaze estimation, and phone detection.

After that, the middle-level features within a temporal window are fused to generate high-level features, which are then used for training and testing a cheat classifier. The high-level features include component-dependent features, such as the mean and standard deviation within a window, and features based on the correlation among the components, such as the covariance features. It is crucial to use a diverse and rich set of features to improve the overall detection performance of the

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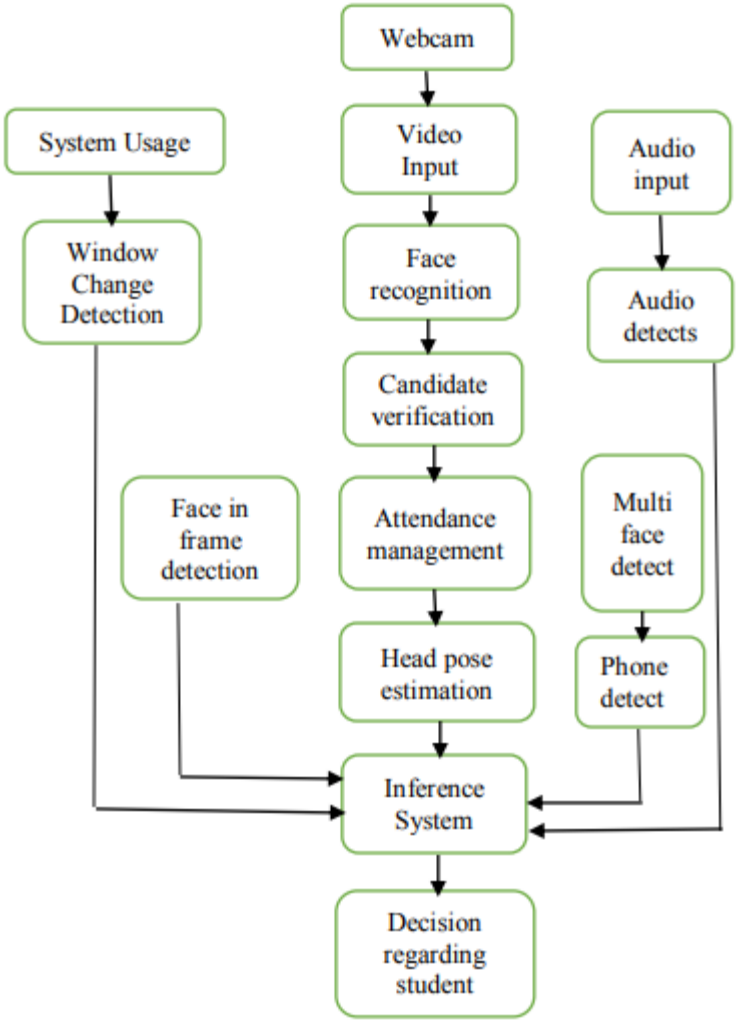
OEP system, since the detection of some cheating behaviors relies on the ignition.

It has been established that physical achieves are not always helpful a much better alternatives is to use automated base examination scheduler. This implies the creation of database management systems (DBMS) which ensure the computer records are kept up to date and made available on demand to those who need them for planning and operational purpose. The level of success achieved in caring out this research work is owed to the methodology adopted.

III. ARCHITECTURE DESIGN

The flow of the entire system is represented in the architecture design diagram as shown in the figure below. The approach of object oriented design is to view a software system as a collection of entities known as Objects. Object oriented design is based on modeling real world objects. Each of the module will be implemented on its own so as to maintain the modules efficiently.



IV. IMPLEMENTATION

Flask: Flask is a microweb frame work written in python. It is classified as a micro framework because it does not require particular tools or libraries. It has no data base abstraction layer, form validation, or any other components where pre-existing third-party libraries provide common functions.

Deep face: Deep face is a deep learning facial recognition system created by a research group at Facebook. It identifies human faces in digital images.

YOLOv3 [You Only Look Once- version 3]: It is a real time object detection algorithm that identifies specific objects in videos, live feeds, or images.

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Volt-bootstrap 5 Admin Dashboard: Volt is a free and opensource bootstrap 5 Admin dashboard featuring over 100 components, 11 example pages and 3 customised plugins.

Tensor Flow: Tensor Flow is an end-to-end opensource platform for machine learning. It has a comprehensive, flexible ecosystem of tools, libraries and community resources that lets researchers push the state-of-the-art in ML and developers easily build and deploy ML-powered applications.

With the planning and analysis out of the way, the actual implementation and coding process can now begin. All planning, specification and design requirements up to this point are coded and implemented into this initial iteration of the project.

- Units
- Use either SI (MKS) or CGS as primary units. (SI units are encouraged.) English units may be used as secondary units (in parentheses). An exception would be the use of English units as identifiers in trade, such as "3.5-inch disk drive".
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Number equations consecutively. Equation numbers, within parentheses, are to position flush right, as in (1), using a right tab stop. To make your equations more compact, you may use the solidus (/), the exp function, or appropriate exponents. Italicize Roman symbols for quantities and variables, but not Greek symbols. Use a long dash rather than a hyphen for a minus sign. Punctuate equations with commas or periods when they are part of a sentence, as in:

a□ □ □b□ □ □ □ □□ □ □

Note that the equation is centered using a center tab stop. Be sure that the symbols in your equation have been defined before or immediately following the equation. Use "(1)", not "Eq. (1)" or "equation (1)", except at the beginning of a sentence: "Equation (1) is . . ."

- Some Common Mistakes
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- The subscript for the permeability of vacuum □0, and other common scientific constants, is zero with subscript formatting, not a lowercase letter "o".
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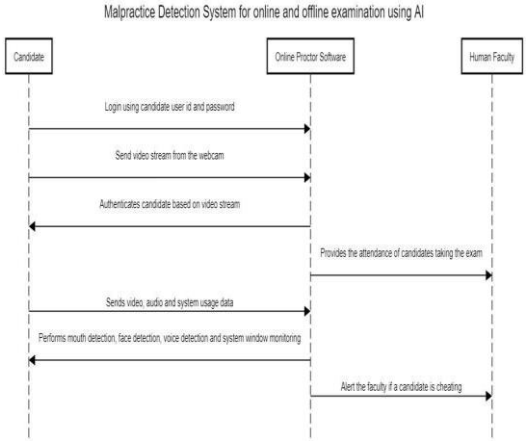

There is no period after the "et" in the Latin abbreviation "et al.".

- The abbreviation "i.e." means "that is", and the abbreviation "e.g." means "for example".

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Headings, or heads, are organizational devices that guide the reader through your paper. There are two types: component heads and text heads.

Component heads identify the different components of your paper and are not topically subordinate to each other. Examples include Acknowledgments and References and, for these, the correct style to use is "Heading 5". Use "figure caption" for your Figure captions, and "table head" for your table title. Run-in heads, such as "Abstract", will require you to apply a style (in this case, italic) in addition to the style provided by the drop down menu to differentiate the head from the text.

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I) Table Type Styles

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Table Head	Table Column Head		
	Table column subhead	Subhead	Subhead
copy	More table copy[a]		

- Sample of a Table footnote. (Table footnote)
- Example of a figure caption. (figure caption)

Figure Labels: Use 8 point Times New Roman for Figure labels. Use words rather than symbols or abbreviations when writing Figure axis labels to avoid confusing the reader. As an example, write the quantity "Magnetization", or "Magnetization, M", not just "M". If including units in the label, present them within parentheses. Do not label axes only with units. In the example, write "Magnetization (A/m)" or "Magnetization {A[m(1)]}", not just "A/m". Do not label axes with a ratio of quantities and units. For example, write "Temperature (K)", not "Temperature/K".

V. ACKNOWLEDGMEN

The preferred spelling of the word "acknowledgment" in America is without an "e" after the "g". Avoid the stilted expression "one of us (R. B. G.) thanks ...". Instead, try "R. B. G. thanks...". Put sponsor acknowledgments in the unnumbered footnote on the first page.

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