VISION-I

Introduction:

The thirst for knowledge is insatiable, the crusade for knowledge is inevitable. It is said that people referred to as sages can tell everything about anything that meets the eye. With a growing affinity for material attachments, the likelihood of the appearance of sages in our era is closer to the imagination than reality, but we have one thing that the sages didn't have access to that is technology. There are still people who want to see the world with those eyes of sages, but couldn't. So, we come to their rescue using the technological advancement that humankind has achieved since the era of sages. In order to do so, we need to present the information about our surroundings using an application.

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Problem statement:

- Design an end-to-end application that uses the power of computer vision to detect different types of surrounding objects, thereby creating bounding boxes around them.

- **The application must be able to detect multiple objects simultaneously in real-time. The focus should be inclined towards detecting as many objects of the category "Vehicles" as possible**. Some examples of category vehicles include - cars, trucks, motorbikes, etc.

- A single tap on any of the bounding boxes formed must present the scraped information regarding the corresponding object in a user-friendly interface. This information varies from one object to another, say from car to truck to motorbike, etc

- The output information must be presented in a tabular manner. Some data fields which must be included in the output are **Selected object, Category of the object(i.e. vehicles), a sentence(s) briefing the user about the selected object.** Other possible data fields associated with the selected object (e.g. year of invention, inventor, etc) can be presented as well. The overall output should be informative, specific to the selected object, and user-friendly at the same time.

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Guiding Example:

Taking into consideration the example of using this application in the domain of self-driving cars, the application should aim to track objects of class "vehicles" in a real-time frame.

A single tap on any object should reveal the general knowledge about that object in tabular form viz, Name, category, inventor/ discover, invention or discovery year, or other relevant information. Here, tables for only two objects are shown for your reference

For a car, the table may look like this:

Object	Car
Category	Vehicles
What is it?	A four-wheeled road vehicle that powered by an engine and is able carry a small number of people.
Inventor	Karl Benz
Year of Invention	1886
Nationality of Inventor	German

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For a truck, the table may look like this:

Object	Truck
Category	Vehicles
What is It?	A truck or lorry is a motor vehicle designed to transport cargo.
Moving/Stationary	Stationary
Inventor	Gottlieb Diamler

Skills required:

Open CV, Web Scraping, NLP, and Deep Learning.

Stage-1(Final-Evaluation):

You will have to submit the private Github repository link containing all the code files, scripts, other required documents, and information. If you are not able to upload the application code files on Github due to their large size, then upload them on google drive and share its link and give access to the email id which will be provided later on. Links to the application which can be used to access it are to be submitted as well (if any). You also need to include documentation, which must

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contain information regarding your submission, working principles, algorithms used, and approach explanations. A Proper explanation for setting up the application on other systems must be provided as well. You also have to submit recordings of your application running on 2 demo videos which will be provided later on.

The link to the 2 demo videos is provided below:-

https://drive.google.com/drive/folders/1u_m16WaUlXE9_No0_XmN6bD9DL2o6kt m?usp=sharing

Stage-2(Presentation Round)

● This round will be conducted online during Cognizance 2022 which will be held from 25th to 27th March 2022.

● The teams will be required to present their respective ideas through a PowerPoint presentation (15 minutes long) in front of a panel of judges during Cognizance, 2022.

● The teams have to run their application code on provided videos in front of the judges.

● The decision of the judges will be final and binding.

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Evaluation criteria:

- The efficiency of object detection and algorithms used, no. of rows in the table containing relevant information of the object, performance on provided demo videos, and ease of using the application (45% weightage)
- Documentation and GitHub repository organization (15% weightage)
- User Interface of the application and representation of the output (10% weightage)
- Clean and understandable code with proper comments (10% weightage)
- Final Presentation (20% weightage)

Guidelines:

- A team can have a maximum of 4 team members.
- Students pursuing an Undergraduate/Master's Degree in any discipline are eligible.
- Only one final submission will be accepted and no other changes will be entertained after the final submission.
- The output must be presented in the specified format. No adherence to the required structure would lead to disqualification.
- The solution presented should be understandable, well-scoped, and addresses the problem statement well.

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- The solution approach used in the final evaluation can slightly differ in comparison to the mid-evaluation one but it must not be totally different and the changes should be clearly mentioned in the documentation.
- Plagiarism in codes, technical paper, and documentation is strictly prohibited. If found, the concerning team will be disqualified immediately.
- If the same codes or any plagiarism at all is found in any two teams' submission, both the teams will be disqualified immediately, irrespective of who did it originally.
- The decisions made by the judges will be final and irrevocable in all regards
- Keep visiting the cognizance website regularly for updates on the problem statement.
- The winners of the activities will receive **fellowships** from **iHUB DivyaSampark** if they are related to Cyber-Physical Systems (PS). Artificial Intelligence, Internet of Things (IoT), Data Science, Computer Vision, Image Processing, Quantum Computing, Product Design, Electronics & Robotics, and all deep technology-related innovations/ideas that can be protected via patents are all included in CPS.
- **i-HUB** does not sponsor platform start-ups that are related to matching or services.

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IMPORTANT DATES

- Final Evaluation Submission: 24th March 2022

- Final Presentation Date: 25th March 2022

The teams have to submit their abstract before the above-given dates.

Queries:

For any query, you can contact:

Abhilash Bag | +91- 7684934251

Or mail your queries with Subject "Query | EVENT NAME | Cogni ID | TeamName"

to events@cognizance.org.in

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