HUMAINT, Work Package 4 "Trustworthy AI for Autonomous Vehicles", Task 4.2 "Bias in AV perception"

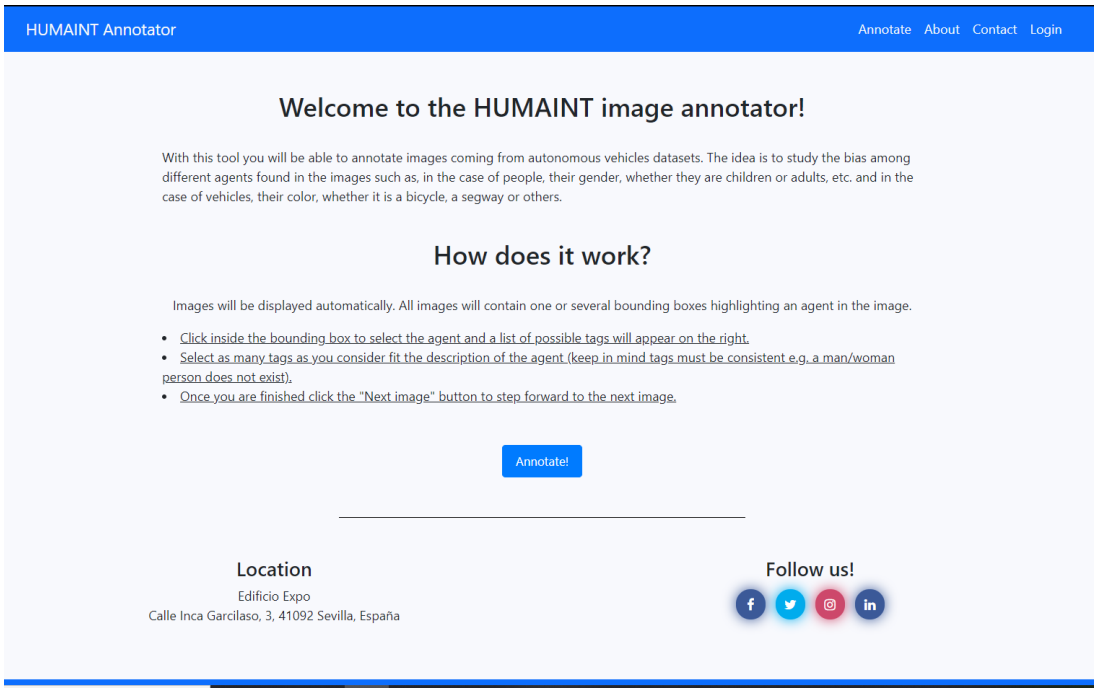
In this document, the architectural design of the HUMAINT Annotation Tool for study the bias in autonomous vehicles perception systems will be described. A mention to several technologies (provider names) will be made using those technologies as describers (examples) of the architecture itself, but other providers can be used.

Frontend:

- HTML/CSS web application with Javascript logic handling:
    - The system will include 5 pages: index.html, login.html, annotator.html, contact.html, about.html.
    - Each page will have its own associated javascript code file: index.js, login.js, annotator.js, contact.js, about.js.
    - The CSS will be handled by a single stylesheet: styles.css.

Description of pages:

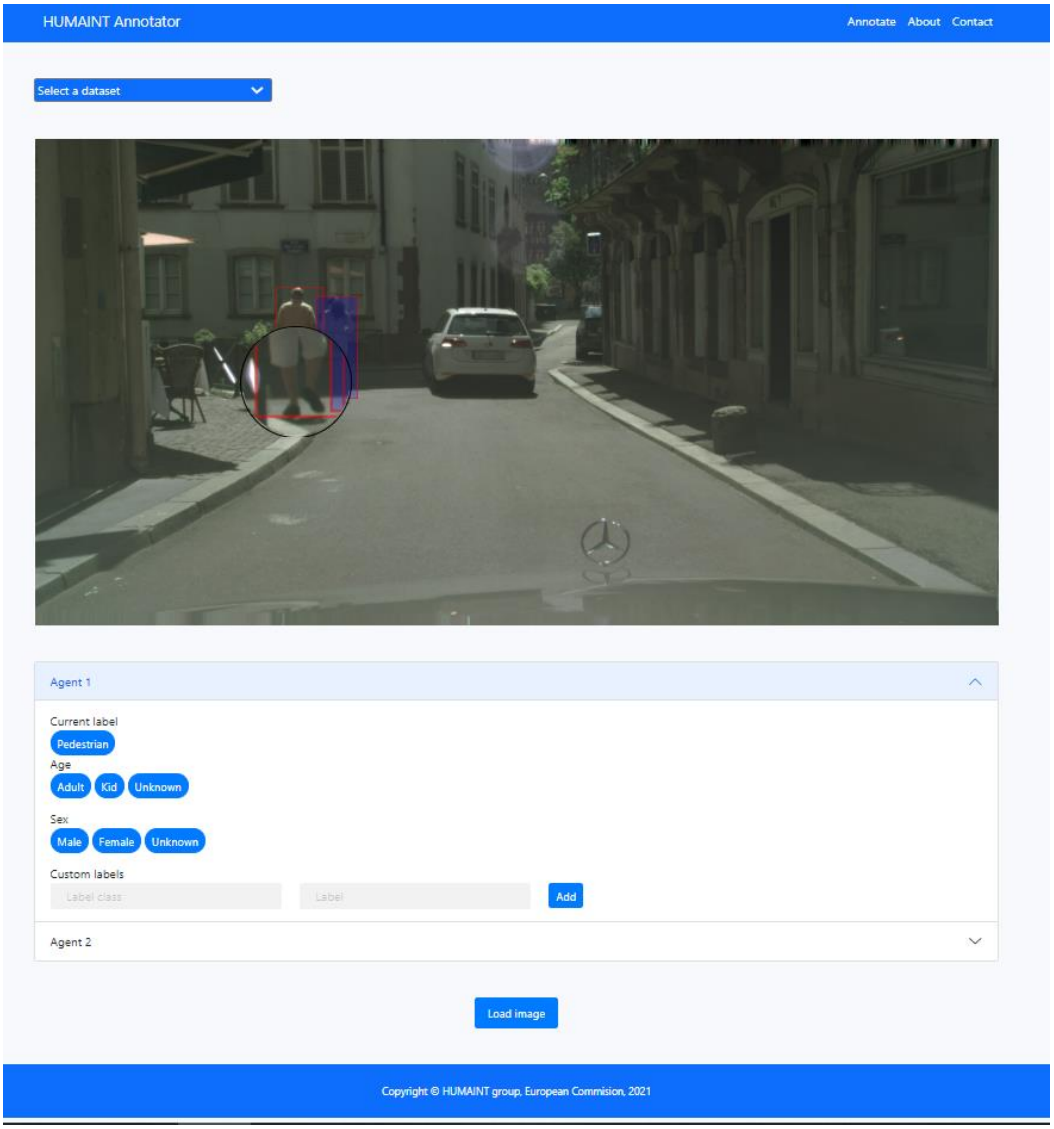
- Index: Here a presentation of the tool will be given to the users. The page body will include the navigation bar (available for all pages), the description of the tool and how to use it and links to external information of potential interest.



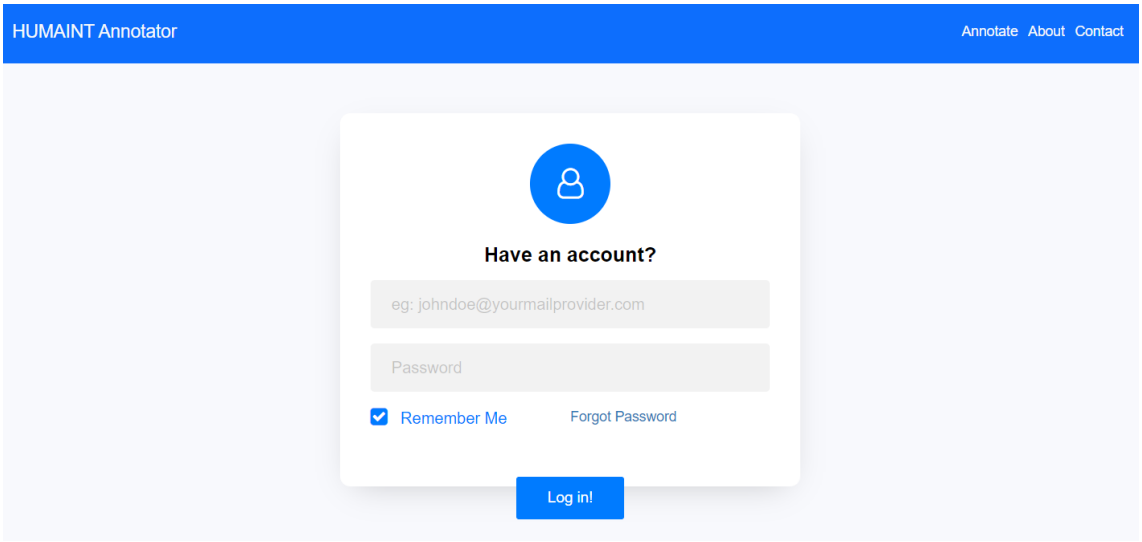
- Annotator: This is the tool itself and is only accessible through user and password protection.

The page allows the user to select the dataset to annotate and then displays the dataset images one by one with the information retrieved from previous annotations (bounding boxes, class label, ...). Current image container is composed by two layers of canvases, one for the image itself and the bounding boxes, and another for the display of the magnified information of the image inside a “magnifying glass” (x2 Zoom). The user must click inside a bounding box to display the information of the clicked agent below the image, where a set of tag options will be available for the user to select them.

Once the user has annotated all the agents of the image, he/she can click on “Load image” for the current image to be saved as “annotated”, the information to be saved and a new image to be displayed. If the user refreshes the page, information is not saved, and another image is loaded.



- Login: This page will display a login form for the user to enter its user and password information in order to access the annotator page.



- Contact: This page will display a contact form to contact HUMAINT team.

- About: This page will show information about the HUMAINT group and the JRC.

Backend:

- All datasets will be saved in an Amazon Web Services (AWS) S3 storage (or equivalent). Each dataset contains several subsets of images in different folders and their corresponding annotation files in JSON format.
- Information related to the path of each image should be stored in a SQL databse.
- Current available datasets occupy ~500GB of storage space. As more datasets could be added to the study, an available storage space of 1TB is highly recommended.

Usage:

- The annotation tool will be used for a limited period of time in the order of a few months. Once the datasets are annotated, there is no need to maintain the tool in operation.
- We may consider to make the tool available in some public repository such as github to allow other researchers to use it for their studies.