

Image Annotation Application task: Report

Equitable Technologies

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Full Stack Intern Role

The code is available publicly on GitHub:
https://github.com/muskanr3/Image_Annotation

Objective

The primary objective of this project was to develop a robust and user-friendly web application for image annotation. Users can upload images and annotate them using a list of predefined class names. The annotations can be utilized for various purposes such as machine learning model training, organizing image databases, or tagging for retrieval.

Detailed Problem Description

Image Upload

Users can seamlessly upload images simultaneously. The upload process is efficient and handles different image formats and sizes robustly, ensuring proper storage.

Image Annotation

Once the image is uploaded, users can choose the annotations for that image from a menu containing predefined class names from the CIFAR-10 dataset. Users can select the appropriate class name that describes the image content.

Data Management

The backend efficiently manages the storage of images and their corresponding

annotations. This includes database management for storing metadata, handling queries for retrieval, and updating annotations.

User Interface

The frontend is designed to ensure a smooth user experience. It is visually appealing and intuitive, minimizing the learning curve for new users.

Technological Stack

- Backend: Django (Python-based framework)
- Frontend: React.js (JavaScript framework)
- Database: PostgreSQL

Additional Features (Bonus)

In addition to the core functionalities, I have implemented the following bonus features:

- **Advanced Image Processing:** Basic image processing features in which the user can resize the image upon upload.
- **Search Functionality:** Ability to search for images based on annotations.

Setup and Run Instructions

Prerequisites

- Python (3.x)
- Node.js
- React.js
- PostgreSQL

Installation Steps

Clone the repository from GitHub.

Backend

- Set up a virtual environment and install Python
- Install Node.js dependencies for the frontend using

```
npm install
```

- Execute the following

```
pip install django
pip install djangorestframework
python -m pip install django-cors-headers
```

- Execute the following

```
python manage.py makemigrations
python manage.py migrate
python manage.py runserver
```

- Set up PostgreSQL and create a database and substitute the database name, user and password in the `settings.py` file.

```
DATABASES = {
    'default': {
        'ENGINE': 'django.db.backends.postgresql',
        'NAME': '<database_name>',
        'USER': '<user>'
        'PASSWORD': '<password>'
        'HOST': 'localhost',
        'PORT': '5432',
    }
}
```

- Configure the database settings in `settings.py`
- Run migrations using

```
python manage.py migrate
```

- Start the Django server using

```
python manage.py runserver
```

- Access the application at <http://localhost:8000>

Frontend

- Go into the `img-ann` folder

```
cd img-ann
```

Execute the following:

- To install all dependencies:

```
npm install
```

- To start the server:

```
npm start
```

- The frontend can be accessed at <http://localhost:3000>

Preview

Homepage

Users can upload their images, resize them and annotate them accordingly. They can also view the images that are pending to be annotated and those which have already been annotated.

Image Annotation

Username

Upload Image
 No file chosen

Width


Height

Annotations
Keep CTRL pressed and click on the options to select multiple annotations

- None
- airplanes
- cars
- birds
- cats


Pending Images

User: user1




Annotations:
None

User: user4




Annotations:
None

User: user7



Annotations:
None


User: user5



Annotations:
None


Annotated Images

User: user2




Annotations:
cars
trucks

User: user3




Annotations:
deer

User: user3



Annotations:
airplanes

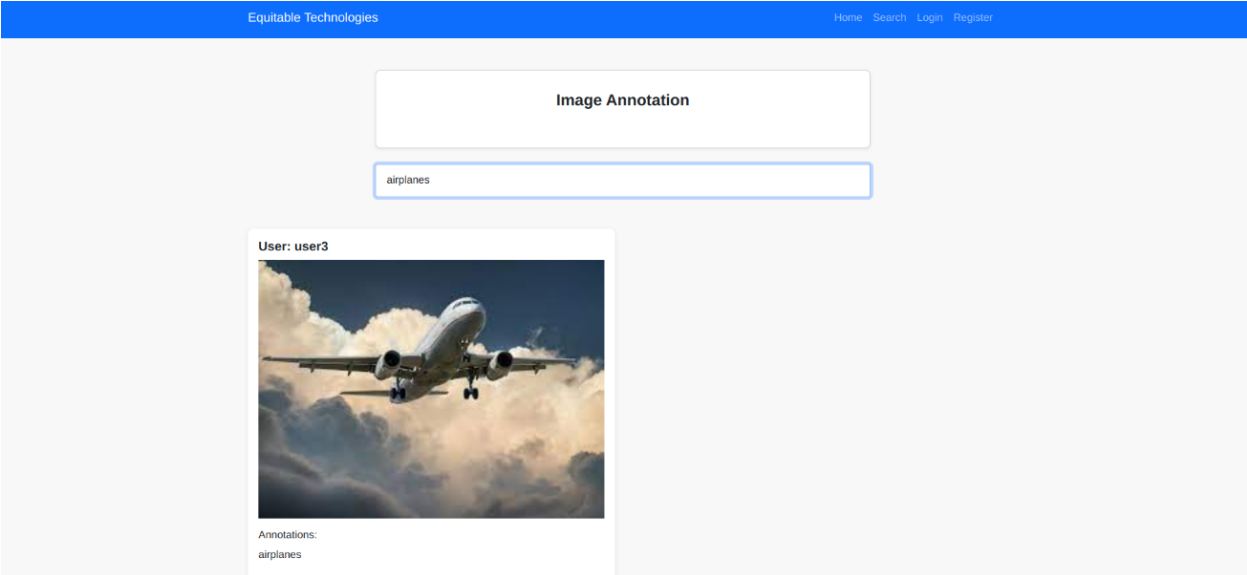
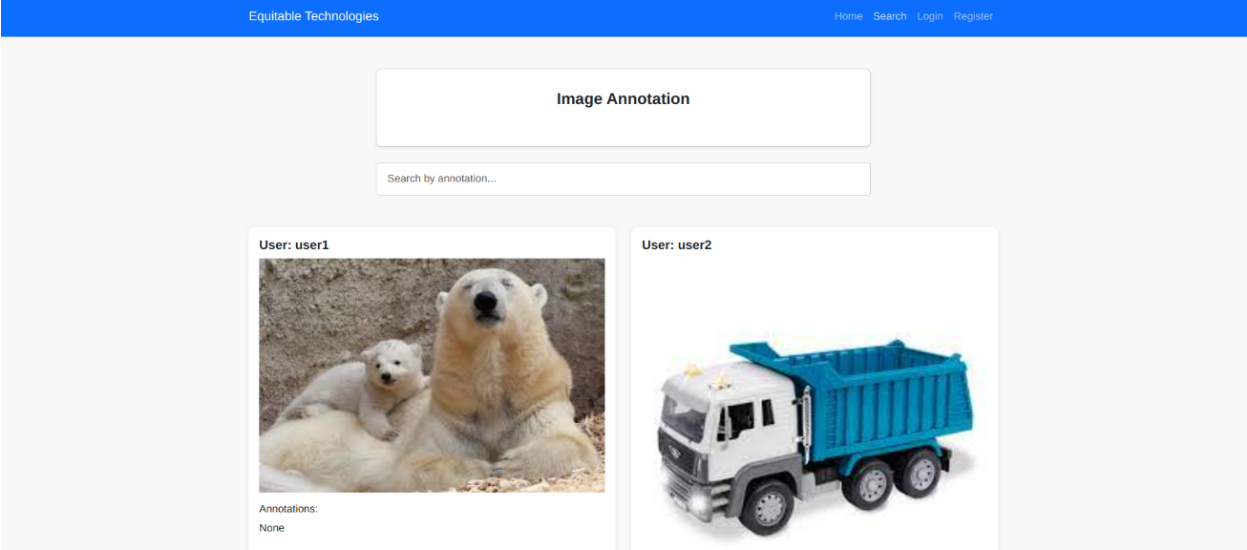
User: user4



Annotations:
dogs

Search Page

Users can use this page to search for the images they have uploaded based on their annotations.



Login and Registration Page

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Password

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