Distributed Systems (2022W) - Proseminar (PS)

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Final Project Description

In the following lessons of the proseminar of Distributed Systems, you will develop and run complex real life tasks using Function-as-a-Service (FaaS), additional cloud services (e.g., S3), and distributed storage (e.g., Redis).

Project description

The main goal of this project is to design and develop an application aimed at recognizing face emotions in images while significantly exploiting parallelism, thus improving execution time. To this end, you will develop a serverless application in a form of a workflow to carry out the following tasks:

1. Read images from a certain storage (e.g., S3 and Redis).
2. Detect faces and emotions of all faces with `AWS Rekognition`.
3. Crop faces and store them.
4. Create collages of cropped faces from the same expression.
5. Store output collages in the source storage.

`AWS Rekognition` allows us to detect up to 8 different emotions: `Happy`, `Sad`, `Angry`, `Surprised`, `Disgusted`, `Calm`, `Confused`, and `Fear`. The list of target emotions in which images should be classified into is completely up to you (note that this determines the number of output collages). The performance of different storage systems will be also assessed, i.e., S3 and Redis cluster. Your serverless application should run as a batch processing without using events. Finally, assume that the number of images is unknown and the processing time of each image may be long.

In Figure 1, you can find an example of the expected behavior of the project for the detection of `Happy` and `Sad` faces.

Project milestones

The project will be developed through several milestones (MSs):

images, target emotions (e.g., Happy, Sad)

Happy

Sad

Detect faces, recognize emotions, crop faces, make collages

Figure 1: Expected operation of the proposed application.

- MS01 - Design of the workflow (1 pts)
- MS02 - Development of the workflow in AFCL (1.5 pts)
- MS03 - Development of the functions of the workflow (1.5 pts)
- MS04 - Integration of the workflow in Apollo and performance evaluation (1.5 pts)
- MS05 - Evaluation of the workflow using distributed databases (1.5 pts)
- Presentation of the final project (3 pts)

For each milestone you will get a separate sheet.

Grading

The project will be graded in two parts:

- advance in weekly milestones (70%)
- mandatory presentation (30%)

The final project represents the 50% of the total punctuation of the PS course. Recall that at least 30% of each individual part is required to pass. Note that the content of the rest of exercises is needed for the project itself, so we highly recommend you to equally effort in all tasks and do not put some aside.

Uploading the task

Please, check each individial milestone for further submission details. You can also check the main time schedule of the repository.

Deadline

Please, check each individial milestone for further presentation details.

Presentation

    The final project will be presented in the last two slots of the proseminar.