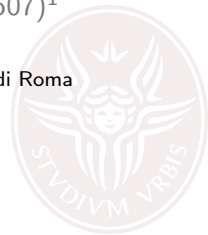# Group Project

Biometric Systems

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Table of Contents

Premise

Before we start, let us say that all of our work, included this own presentation, is open sourced and available on Github:

https://github.com/casalinovalerio/biosys-project

There is also a script to replicate our setup for future projects.

Overview

We wanted a face recognition based authentication application that is simple, yet particular. We deployed our test using:

- A **web interface**[1] that works as a demonstrative placeholder. It gets the face with the camera, makes requests to our API server, which returns only a binary value for the success of the authentication.

- An **API server**[2] that queries the faces database and recognizes faces using the **@ageitgey's tool**[3].

- A **database based on Blockchain**[4] that is an open source wrapper for a blockchain database that can be queried with standard SQL syntax. Implemented on the API server too.
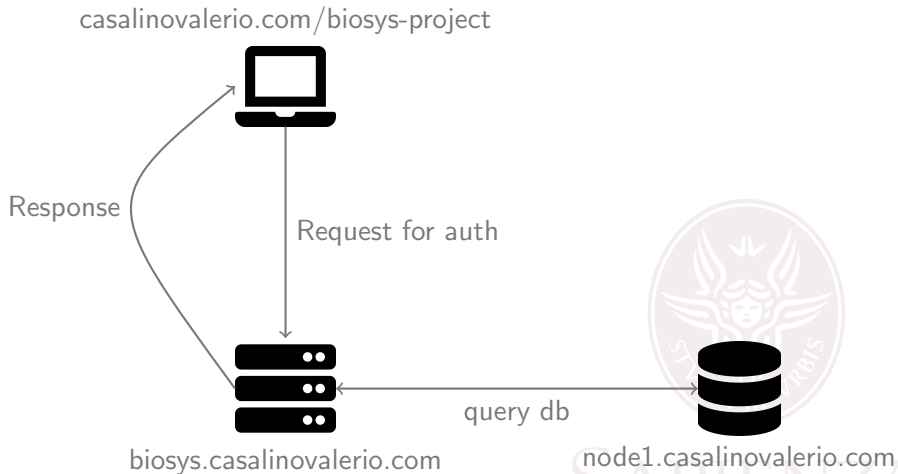
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[1]Hosted by Github Pages: https://pages.github.com/
[2]Hosted by Digital Ocean: https://www.digitalocean.com/
[3]Github project here: https://github.com/ageitgey/face_recognition
[4]Implemented by Bigchaindb: https://www.bigchaindb.com/

Overview scheme[5]

Table of Contents

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The web Application

The web application perform the authentication as follows:

▶ Captures frames in a canvas.

▶ Analyzes them through the opencv's javascript[6].

▶ As the time one button is pressed, the canvas frame is sent to our server[7], which can register the face, or match the face with an already registered user.

▶ In the end, you can be registered, or you can get the authentication response status.

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[6] https://tinyurl.com/s2yprk7
[7] https://biosys.casalinovalerio.com

Does it work?

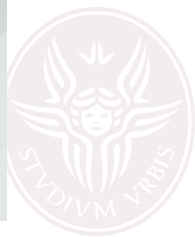We actually did some **serious** testing on it. As you can clearly see in the picture below, it works!

Table of Contents

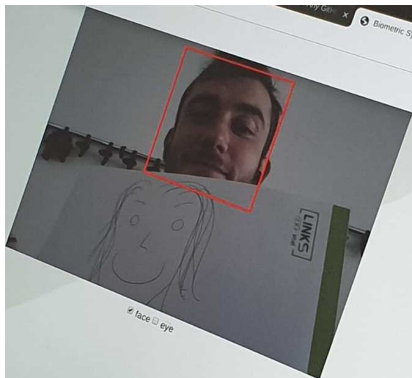# The Block-chain database

As database for new faces, we implemented a **Block-chain**.
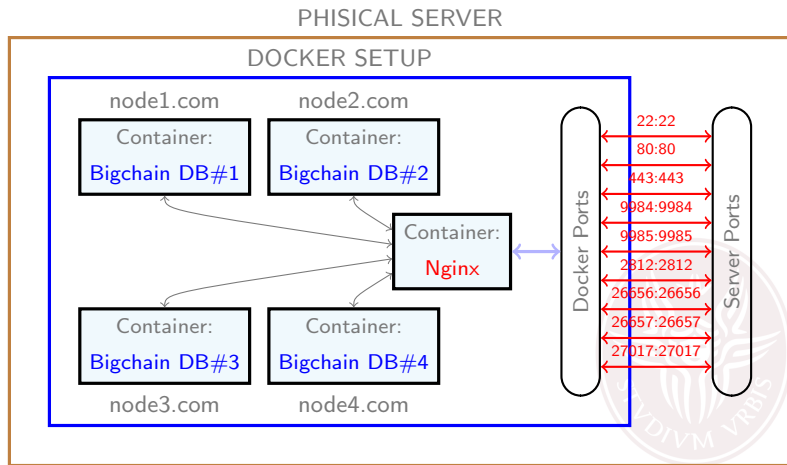We used an open-source implementation of it, called BigchainDB[8].
We also used Docker[9] to deploy 4 containers running the application.

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[8]Main page: https://www.bigchaindb.com. Documentation here.
[9]Main page: https://www.docker.com.

Architecture Implementation[10]

How to interact with the DB

We are assuming that we have an enstablished connection set up.

Query data

```
connection.searchAssets('AwesomeAsset')
.then(assets => console.log('Found assets:', assets))
// Read the console to look at the assets
```

Load data (make a transaction)

```
// Create transaction first (txTransferBob)
driver.Transaction.signTransaction(txTransferBob,
alice.privateKey);
conn.postTransactionCommit(txTransferBobSigned);
```

Simple as that...

Table of Contents

Connecting the Web app to API server

Send faces function in web app

```
...
var canvas = document.getElementById("canvasOutput");
picture.src = canvas.toDataURL();
...
xhr.open('POST', 'url/send-faces.php', true);
...
```

Recognize face function in web app

```
...
var canvas = document.getElementById("canvasOutput");
picture.src = canvas.toDataURL();
...
xhr.open('POST', 'url/reco-faces.php', true);
...
```

Connecting the API to the DB

This is how we did it:

Getting the response

This is how we did it:

Table of Contents

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How we tested

We tested our solution with a custom script.

Use the script (to edit)

./test.sh -d /path/to/test-faces

For more info on how the script works, just look at it[11], it is open source!

We let the script run on the same server for the longest time possible, until we could obtain a reasonable evaluation.

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[11]Script here: `this-is.temp`

Testing approach

How it performed

Really well, it is a revolutionary project!

Table of Contents

Conclusions

Greetings...

Actual deployment considerations...

Performance considerations...

The Group

This is a great ending message from chilled-capibaras!

DO YOU EVER FEEL

LIKE YOU'RE CHAINED TO YOUR DESK?

This is a real cool catchy phrase!!