

scraps_processing prototype

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presented to Sabine Rosenberg
for class CART451

brief project description

My project aims to facilitate the digital collection of information about fabric scraps as well as its visualization. Its goal is to create a process to efficiently gather useful information about a scrap:

- Textile Class(Natural or Synthetic)
- Textile Type(Cotton, Polyester, Wool,...)
- Notes about the scrap
- Picture of the scrap
- Dimensions of the scrap
- Color of the scrap

Since scraps are often small and oddly shaped, they have much less value than regular fabric. So, the process of cataloging them needs to be efficient, easy and quick. I had thought about different ways of getting all the information I needed. Most of them are pretty straightforward; except for the dimensions of the scrap. The dimensions are also very important for the user to know, especially in a digital context. It allows them to easily compare different scraps and how they can be used.

Hence, I needed to find an efficient, easy and intuitive way to get the dimension of the scrap. I was looking at computer vision solutions but they all needed a fixed and specific setup. If I wanted the app to be used by anyone, the barrier of entry needed to be slim and easy to surpass. Then I thought about the measuring apps. There are no specific ways to measure shapes but at least I knew the building blocks were available.

current work done

So I started looking at how these measuring apps are made. I found that a lot of them were done using AR technology. It allowed for a user to select a point in the “real space” and map this into a 3D environment. Then, with two points, I could easily find the distance between them and expand this to multiple times.

So, I started looking into AR frameworks. I first started experimenting with Viro. It looked promising but I quickly realized that it was very hard to work with it and that it had been poorly maintained. It was really hard to make any changes and any new packages added to the project would cause problems.

After giving up on Viro, I looked into A-Frame. It is open source and runs on HTML and JS directly. But similarly to Viro, I had a lot of trouble getting it to work. I could find out how to produce a “hit point”, which

is when the user points to an object in the camera and the app maps this to a point in 3D space. After several attempts, I decided to move on.

Finally, I started experimenting with Unity. It is way overkill for what I need but my last two attempts were not successful. It took some work to get it started but it eventually worked. I was able to detect planes, place points in space and get measures between points. I ended up making the whole prototype, UI included, with Unity.

For the API, I decided to use Flask. It is minimalistic, easy to use and has just what I need. I also opted for Mongo for the database.

next steps

The next steps will be to start working on the visualizing interface. It will need to implement all the features that I have planned. Through my interviews with designers and hobbyists, a couple of features looked useful:

- Filtering the scraps with different attributes like:
- Being in a certain spectrum of color
- Their total size
- The textile type or class
- See if they fit a certain shape
- Visualizing the scrap's shape easily
- Modifying the scraps information
- Contacting the owner of the scrap

The interface will be the primary way of accessing the scraps' data hence it needs to be tailored for functionality and be useful for the target audience

I also need to improve the capture interface, while it may work, it is not the most user friendly experience. It needs to be more "sleek", intuitive and easy to use as well. It also needs to send all data correctly like the picture and the 3D environment information which is not the case right now.

I will also need to do user testing and make sure the functionalities are actually useful for real life users. I am thinking of using the same people I interviewed initially.

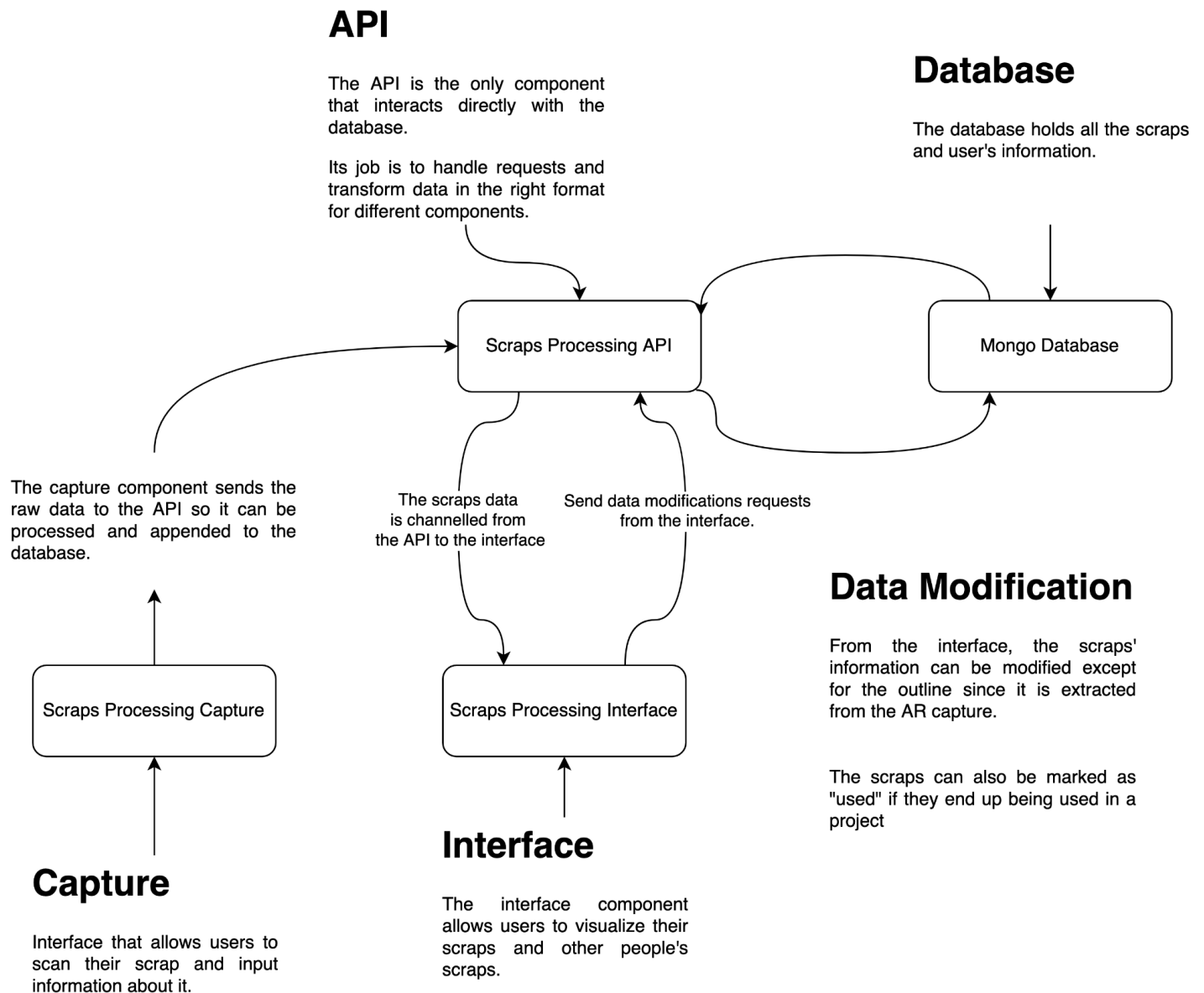
And in general, everything needs a little bit of reworking and tuning. I will try to get the core components up and running and improve from there.

demo

See the live demo on YouTube.

general architecture

This diagram explains the general architecture of the whole project. For now, The API and the Capture application have been started, the interface is planned but not implemented.



capturing workflow

This diagram explains the general technical flow of the capturing of a scrap. The application is built in Unity and is using AR foundation.

