

Prototype Presentation

Graduation Project 1

Cocktail AR Maker

Team 12

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01

Project Summary



Project Summary

Cocktail AR Maker

: An AR app that allows users to film the process of creating cocktails in real time and receive help in making.





02

Team members And roles



Team members and Roles

| 이름 | 역할 |
|--------------|---|
| Yejin Kang | Preparing data and samples, Training DeepLab |
| Yunli Kim | Preparing data and samples, Training DeepLab |
| Seungmin Lee | Team Leader, Developing application UI and features |



03

Prototype



Scope and purpose of prototype development

- 1) Scope of Implementation : Cup and Liquid Recognition, App UI
- 2) Purpose of Implementation
 - To check if the custom model can recognize liquid and cups when trained with collected data samples, since they were not well recognized by the original model.
 - Since the app does not have a server, the **UI** was needed to actually apply the functions on the smartphone.

Prototype Risk Identification and Test Items

1) Risks

- Training new datasets in deeplab - Transparent liquids are more likely to be poorly recognized
- Bias may exist in prepared data
- Overfitting may occur because of additional training to existing models
- Applying DeepLab models to Android Apps
- Running DeepLab models in real time

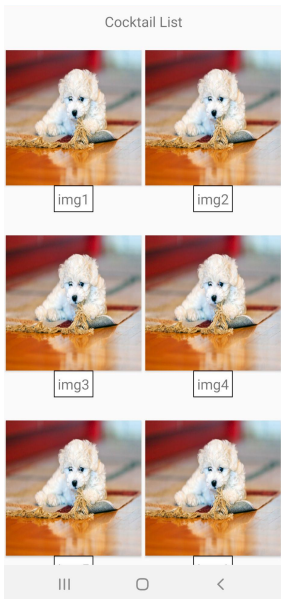
Prototype Risk Identification and Test Items

2) Test Items

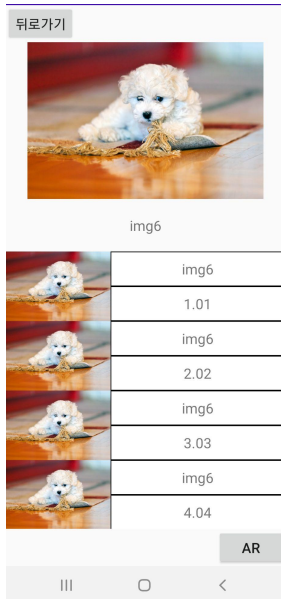
- Cup Recognition
- Recognition based on the color of liquid
 - Colorless liquid
 - Colored liquid
- Recognition while pouring liquid into a cup
- Recognition when there are objects other than cups in the background

Prototype Execution Results

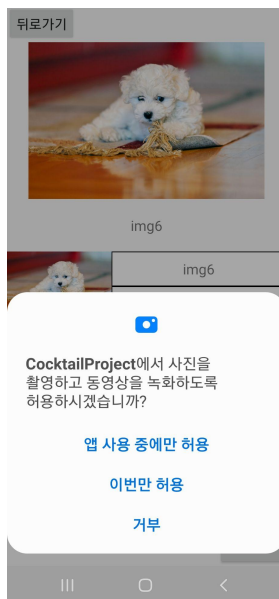
Basic UI



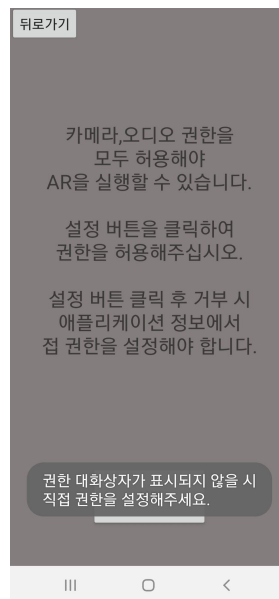
Cocktail List



Details



Permission Request



Permission Settings



Recognition Result

Prototype Execution Results

Model Comparison

뒤로가기



재료 무엇
넣으세요.

다음 단계

Original Model

뒤로가기



재료 무엇
넣으세요.

다음 단계

Trained with
100 Datas

뒤로가기



재료 무엇
넣으세요.

다음 단계

Trained with
200 Datas

Prototype Execution Results

Cup Recognition :
transparent cylindrical cups



ex 1 : A Tumbler



ex 2 : A cylindrical cup

Prototype Execution Results

Recognition based on
the color of liquid



재료 무엇 넣으세요.

다음 단계

Colorless
Liquid



재료 무엇 넣으세요.

다음 단계

Colored
Liquid

Prototype Execution Results

Recognition while pouring liquid



재료 무엇 넣으세요.

다음 단계



뒤로가기



재료 무엇 넣으세요.

다음 단계

Prototype Execution Results

Recognition when
there are objects
other than cups in
the background



Prototype Analysis Results

- 1) Colored liquids have a better recognition rate than colorless liquids.
- 2) If there are other objects in the background, the recognition rate is poor.
- 3) Poor liquid recognition rate due to insufficient liquid data.
- 4) The recognition rate depends on the angle of the shot.

Changed requirements in prototypes

1. Android 11 Permission Issue

Starting in Android 11(API 30), if a user makes more than one denial of a particular permission, the app will not be able to request system permission.

-> If the user moves to the Request Permission window and rejects it again, the user must set the permission manually.

Changed requirements in prototypes - Future considerations

2. Dataset-Related Issues

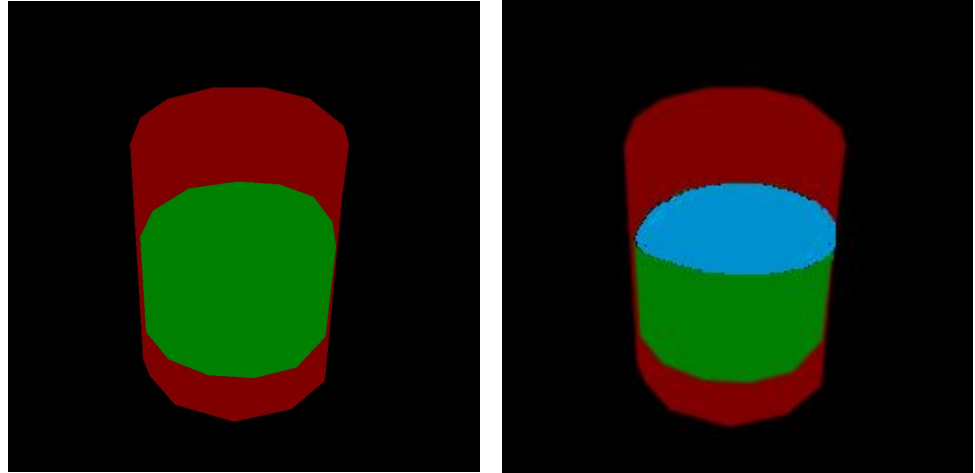
- Since the current model recognizes opaque cups and transparent cups equally, it is necessary to consider whether to distinguish labeling or change requirements to recognize only valid cups.



Changed requirements in prototypes - Future considerations

3. Recognition Issues

- Need to consider labeling the top of the liquid separately
- Requires post-processing function to smooth out the recognized range
- Requires a function to calculate the amount of liquid



04

Closing

What we learned

- Need to Learn more about DeepLab, AR, and Android.
- Dataset needs to be collected and configured more diversely.

Future Schedules

- **June** : Present prototype, write report, collect additional Dataset
- **July & August** : Improve model accuracy, extract and test models every 1-2 weeks, proceed AR study, collect additional Dataset
- **Second semester** : Add AR function and complete the application



Q&A

