Camera Dialer

Team Members Names:

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COMPUTER VISION COMPETITION

IHUB

Ninja Team

IMAGE PROCESSING

TA. ALY OSAMA

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OBJECTIVE

Android application for name / phone extraction from any given card and save them on the phone.

DESCRIPTION

We are seeking to build an application where users will be able to scan phone Numbers easily from Business cards.

They will have the options of:

- Calling the scanned Phone number immediately
- Scanning the Phone Number and the Name both and saving them to the user's Contacts log
- Scanning the Phone Number only and the user will have the Option to write the name himself before saving it to the user's Contacts log

INPUT

Business Card like this:

Then the Name and the Phone Number will be scanned

NEEDED INSTALLATION

For python

“requirements.txt” → needed pip installations

“APTFILE” → needed apt installations

IMPLEMENTATION PLAN

- **Part 1: Preprocessing the image**

  Find contours in the image to get the boundaries of the card.

  Remove noise from the image and apply Binarization.

  Scan the Name and the Phone Number from the image.

- **Part2: Android Application**

  The Application will give the options to the user whether to directly call the scanned Phone Number or to save the Phone Number to the Contacts log

- **Part3: Integration**

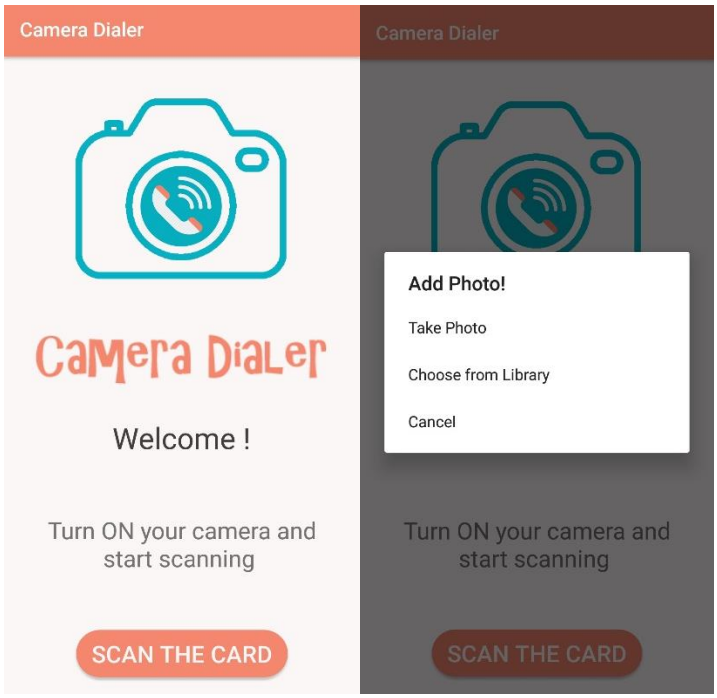
  Communication between python and andoid.

PROCEDURE AND DEMO WITH PICTURES:

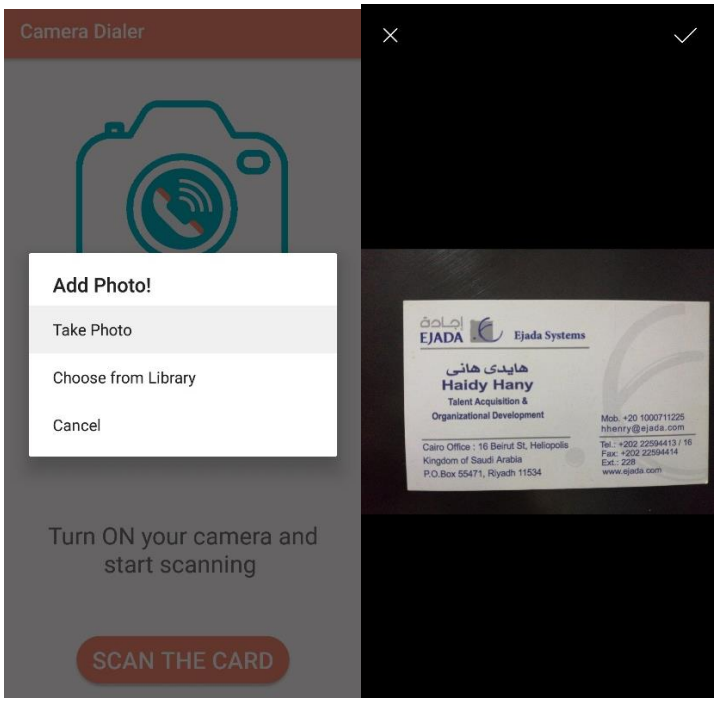
1. Open “Camera Dialer” Application
2. Take the photo from the user
3. Card segmentation from the image
4. Image processing on the card to remove noise and ensure it has no rotation angle
5. Text extraction
6. Numbers/Names detection
7. Output the detected names/phones for the user to choose which one to Save in his contacts or Call immediately.

Here is the demo:

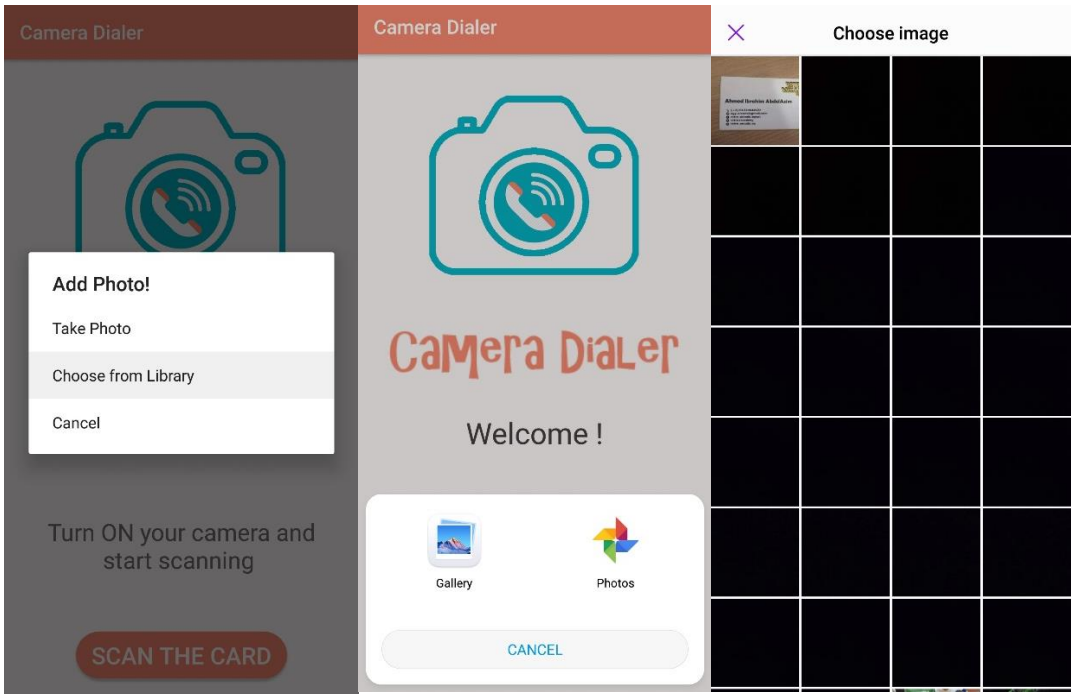
Open The application and click Scan The Card button.



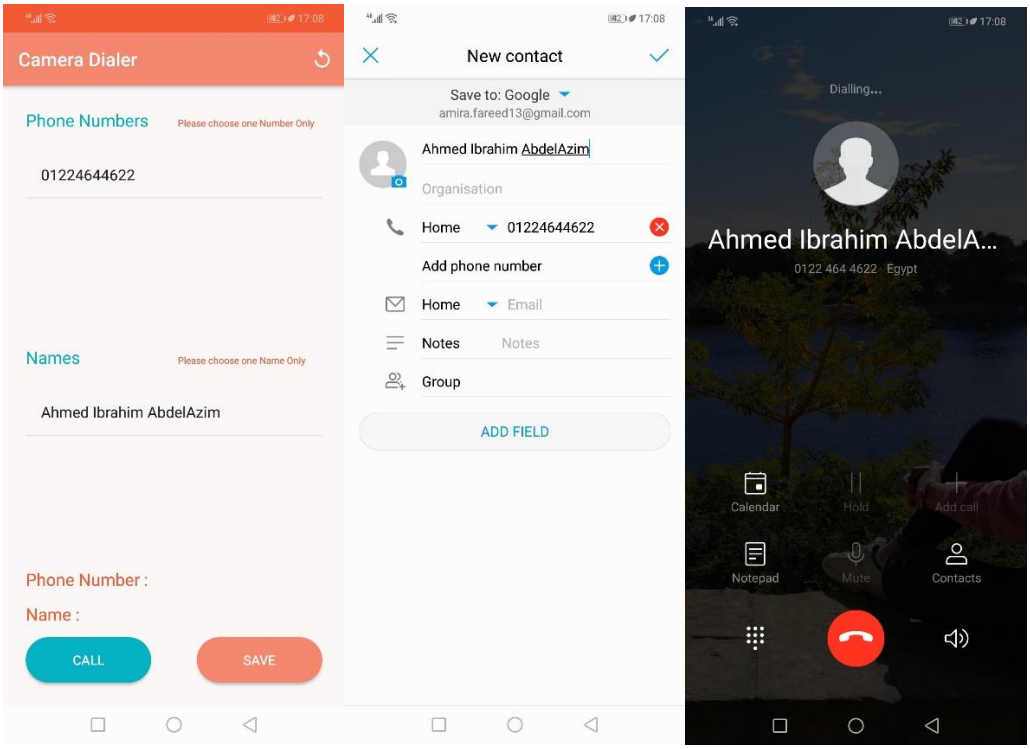
If you choose to take photo by camera, capture the card.



If you choose photo from gallery.



After processing the camera and extract phone numbers and names, Select the suitable ones, Click Save button to save the contact and number to your phone OR Call button to Call him/her.



TOOLS

- Python
- Android Studio
- Flask
- Heroku Server
- Java
- Emulator or Android Phone

MANAGEMENT

We were divided into two teams; (Python and Detection) Team and Android team.

Python team:

- Nourhan Mohamed Salah AND Eslam Alaa Zaki

1. Card Detection

We started by detecting the card from any captured image assuming we received it from the user, filtered it from noise, and used **Canny Edge Detection** and CV2 functions for rectangular detection using contours.

2. Image processing on the card

We made sure there's no rotation in the image using "**Four_Point_Transform**" function.

3- Text Extraction

We used **Pytesseract OCR** for text extraction from the card, unfortunately we found a problem that our rotation function rotates the card according to edges not text! And tesseract works only for un rotated text. so we made "run function" that checks if there's no output from tesseract, it rotates the card and re-extract the text from OCR.

4- Numbers/Names detection

After having tesseract output in a list, we started filtering it by saving phones in “phones_list” and possible names in “names_list” using our own functions for phone and name detection.

Android team:

- Amira Mohamed Fareed, Eslam Medhat Mahrous And Basma Saeed Ragab

There’re 2 activities in the architecture:

1. Main Activity

   The home Page of the application where the user selects a way to Scan the card:

   - From Gallery (using Utility Class)
   - From Camera (using URI Class)

2. Call_Save Activity

   In this class we send the “JSON image” to the server and receive an output of (Names and Phone Numbers Lists) and parse them, then display them to the user to choose the suitable ones to Call immediately or Save to his Contacts.

INTEGRATION

How to make the communication between python and android?

We used FLASK Web frame for python as a server, we converted the image in android to string base64 and sent it in JSON format as a POST Request that will be received by python code on flask server.

And project is deployed on “**Heroku**” server.