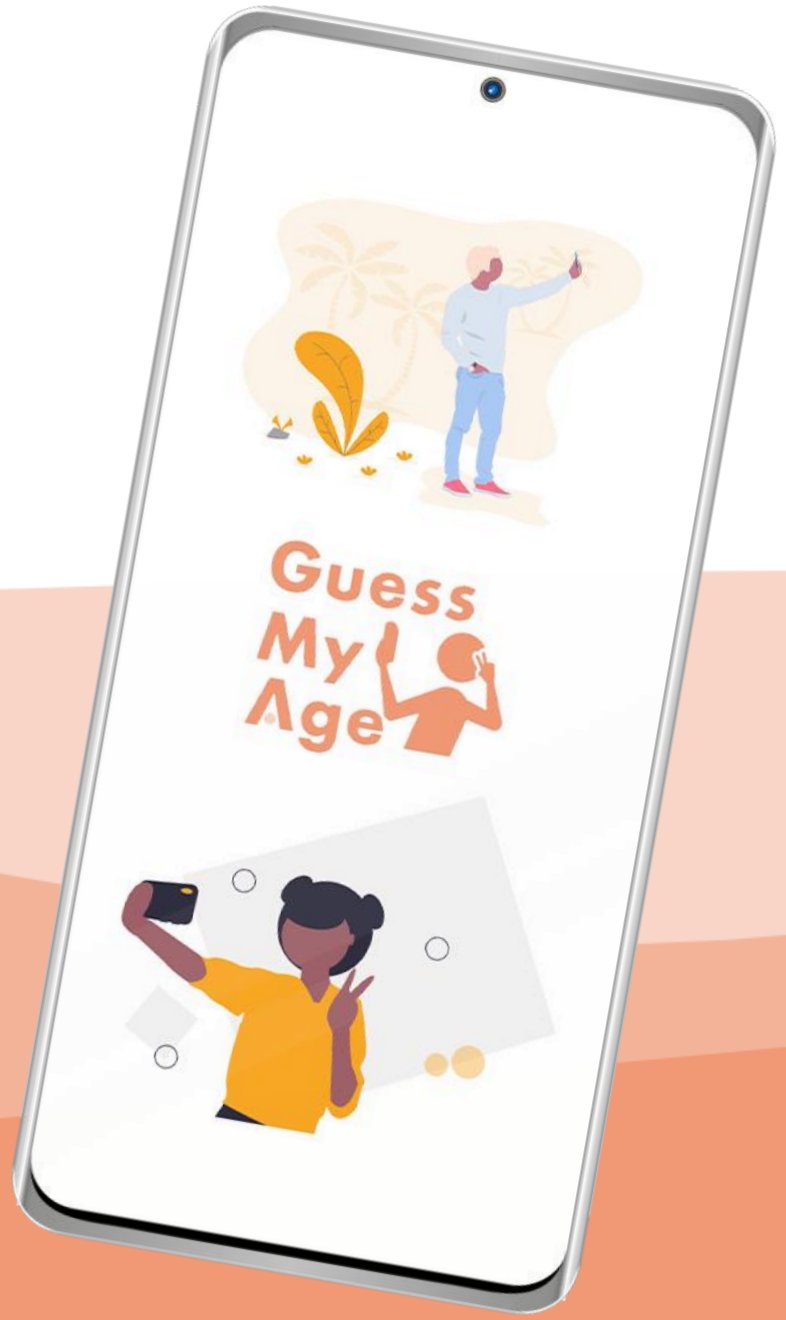
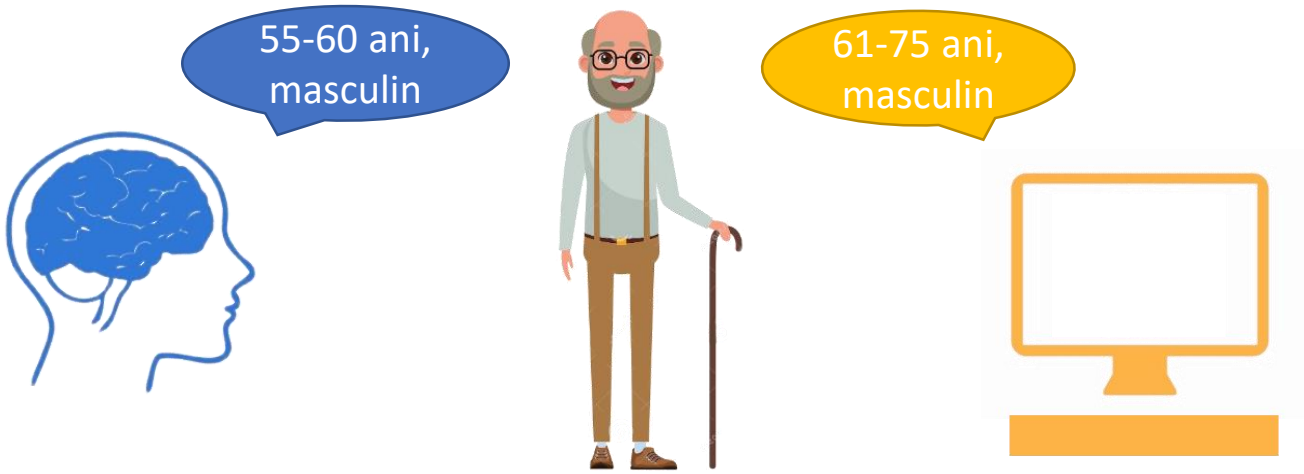


Aplicație pentru clasificarea categoriei de vârstă

Cuprins

- Motivație
- Tehnologii și librării folosite
- Etape în dezvoltarea aplicației
- Interfață
- Funcționalități
- Rezultate

Motivație

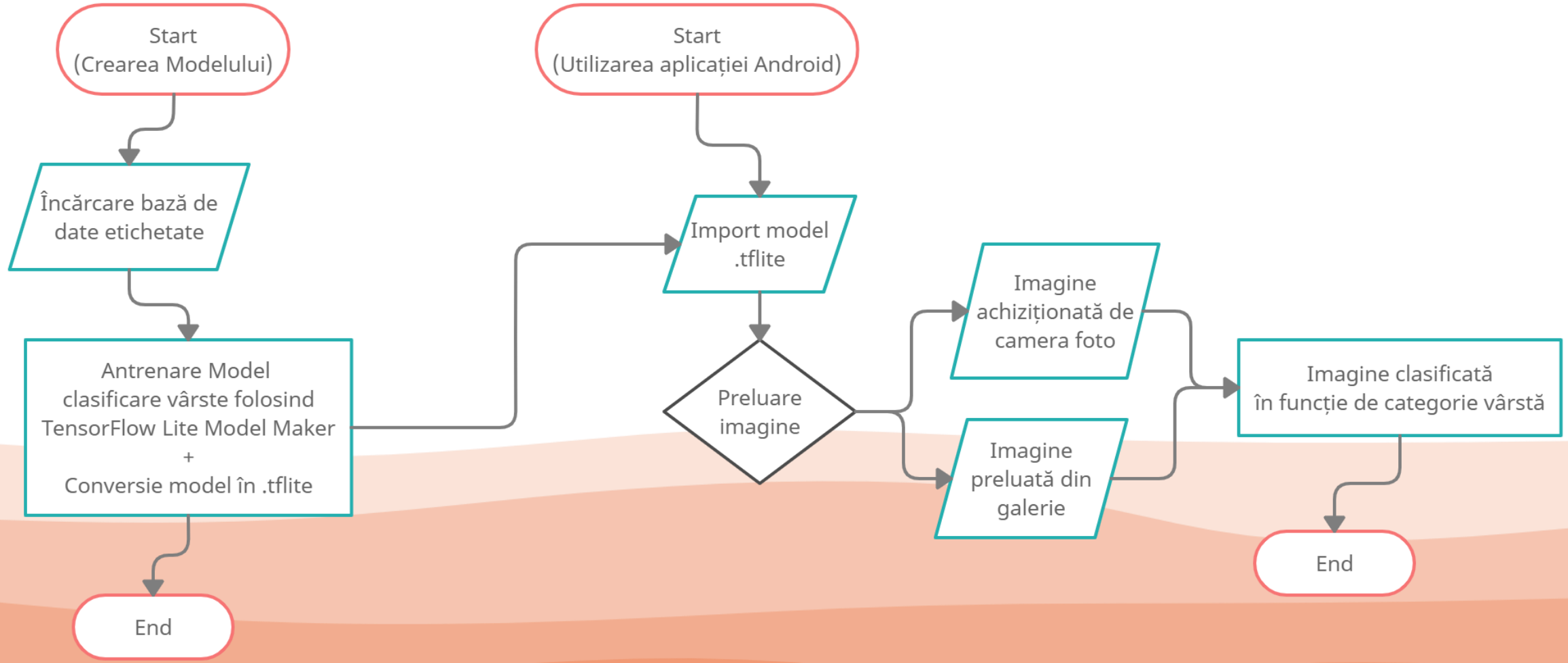


- Amuzament
- Estimare automată a vârstei
- Integrare → aplicație pentru recomandarea produselor skin-care

Tehnologii și biblioteci

- TensorFlow Lite Model Maker
- IDE:
  - Jupyter Notebook, Google Colab
  - Android Studio (Android SDK)
- Limbaje:
  - Python
  - Java
- Git & GitHub

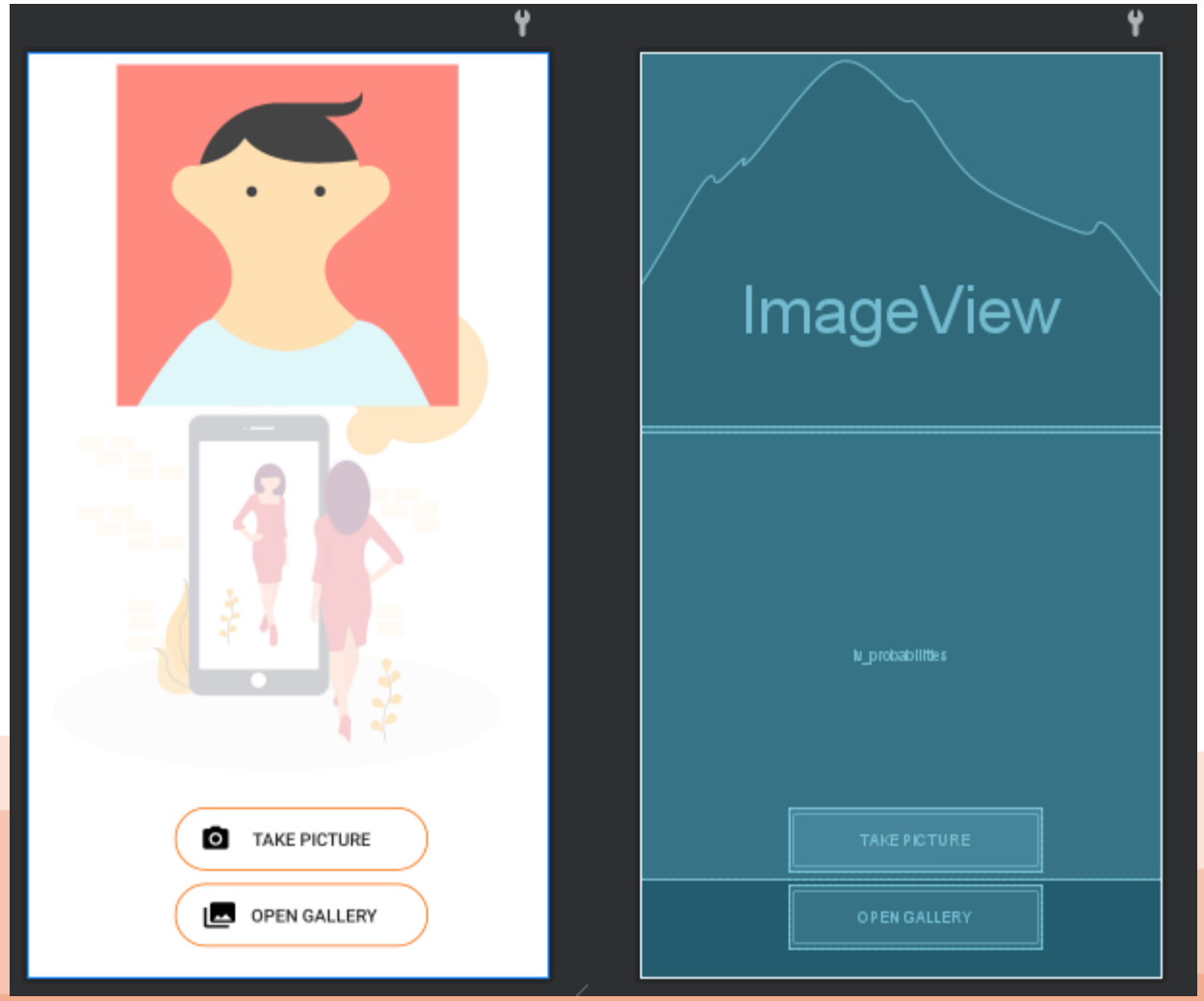
Dezvoltarea modelului și utilizarea aplicației



Interfață

```
<androidx.constraintlayout.widget.ConstraintLayout
xmlns:android="http://schemas.android.com/apk/res/android"
    xmlns:app="http://schemas.android.com/apk/res-auto"
    xmlns:tools="http://schemas.android.com/tools"
    android:layout_width="match_parent"
    android:layout_height="match_parent"
    android:background = "@drawable/bg_activity_main"
    tools:context=".MainActivity">

  <Button .../>

  <Button .../>

  <ImageView .../>

  <ListView .../>

</androidx.constraintlayout.widget.ConstraintLayout>
```

```
    <Button
        android:id="@+id/bt_take_picture"
        android:layout_width="200dp"
        android:layout_height="50dp"
        android:layout_marginBottom="84dp"
        android:background="@drawable/btn_picture_round_button"
        android:drawableStart="@drawable/btn_camera"
        android:drawablePadding="2dp"
        android:gravity="center"
        android:paddingLeft="20dp"
        android:paddingRight="30dp"
        android:singleLine="true"
        android:text="@string/take_picture"
        app:layout_constraintBottom_toBottomOf="parent"
        app:layout_constraintEnd_toEndOf="parent"
        app:layout_constraintHorizontal_bias="0.554"
        app:layout_constraintStart_toStartOf="parent" />
```



Funcționalități

- Inițializare componente UI
  - Afișarea imaginii încărcate
  - Creare buton pentru cameră foto / galerie
  - Apelare funcții trigger la apăsarea butoanelor

```
private ImageView imageView;
private ListView listView;
private ImageClassifier imageClassifier;

private void initializeUIElements() {
    imageView = findViewById(R.id.iv_capture);
    listView = findViewById(R.id.lv_probabilities);
    Button takePicture = findViewById(R.id.bt_take_picture);
    Button openGallery  = findViewById(R.id.bt_open_gallery);

    /*
     * Creating an instance of our tensor image classifier
     */
    try {
        imageClassifier = new ImageClassifier(this);
    } catch (IOException e) {
        Log.e("Image Classifier Error", "ERROR: " + e);
    }

    takePicture.setOnClickListener(new View.OnClickListener() {
        @Override
        public void onClick(View v) {
            // checking whether camera permissions are available.
            // if permission is avaialble then we open camera intent to get picture
            // otherwise reqeusts for permissions
            if (hasPermission()) {
                openCamera();
            } else {
                requestPermission();
            }
        }
    });

    openGallery.setOnClickListener(new View.OnClickListener() {
        @Override
        public void onClick(View v) {
            openGallery(v);
        }
    });
}
```

Funcționalități

```
    private void openCamera() {
        Intent cameraIntent = new Intent(MediaStore.ACTION_IMAGE_CAPTURE);
        startActivityForResult(cameraIntent, CAMERA_REQUEST_CODE);
    }
```

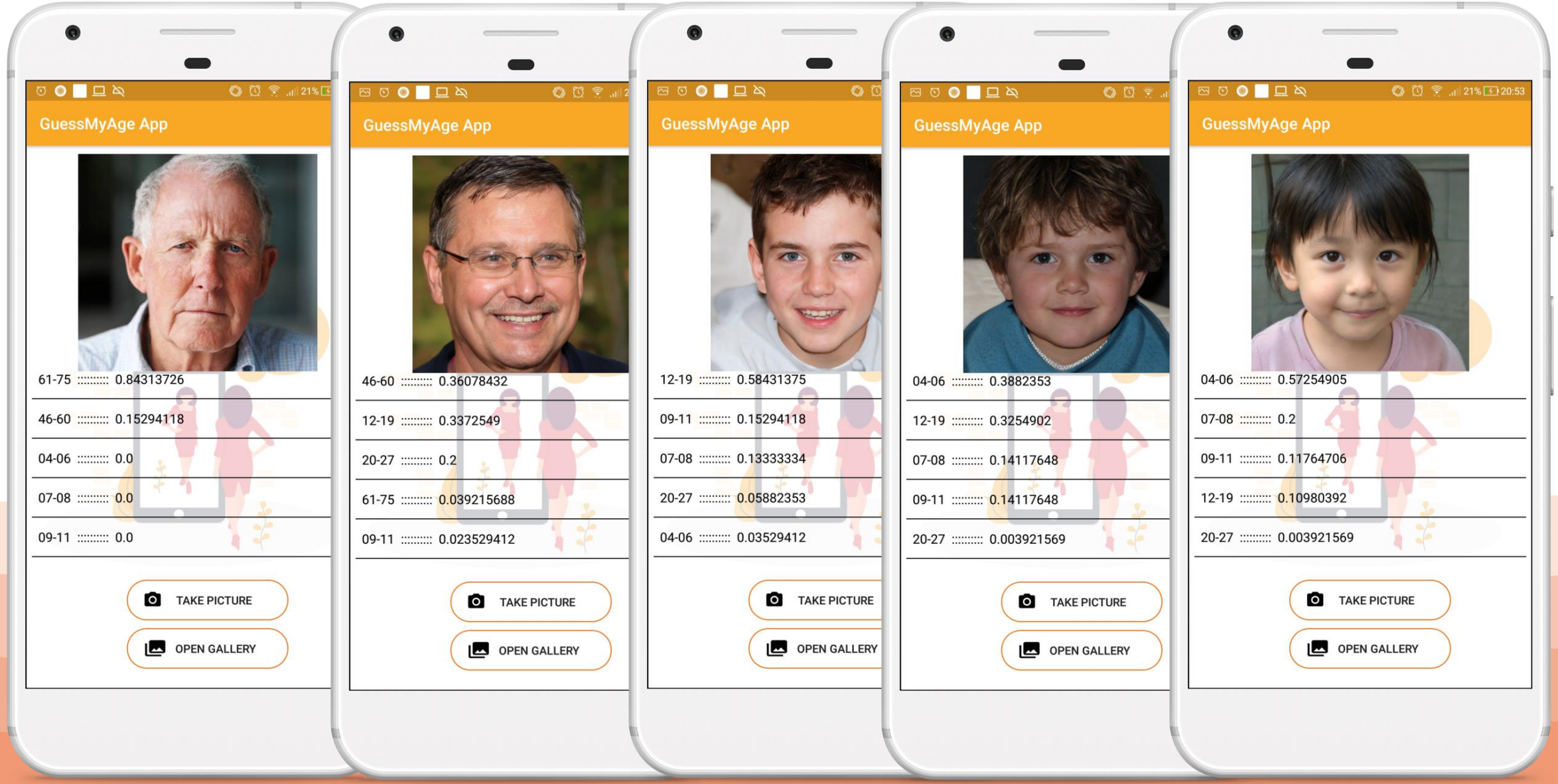
```
    public void openGallery(View v){
        // invoke the img gallery using an implicit intent
        Intent photoPickerIntent = new Intent(Intent.ACTION_PICK);

        File pictureDirectory =
Environment.getExternalStoragePublicDirectory(Environment.DIRECTORY_PICTURES);
        String pictureDirectoryPath = pictureDirectory.getPath();
        // get a URI representation
        Uri data = Uri.parse(pictureDirectoryPath);

        // set the data and type. Get all image types
        photoPickerIntent.setDataAndType(data,"image/*");
        // invoke activity
        startActivityForResult(photoPickerIntent, IMAGE_GALLERY_REQUEST);
    }
```

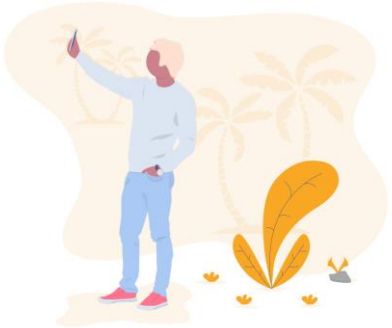
Funcționalități

- Clasificarea propriu-zisă a imaginii și afișarea claselor cu probabilitățile aferente (prin popularea listei)

```
    @Override
    protected void onActivityResult(int requestCode, int resultCode, @Nullable Intent data) {

        if (requestCode == CAMERA_REQUEST_CODE) {
            // getting bitmap of the image
            Bitmap photo = (Bitmap)
Objects.requireNonNull(Objects.requireNonNull(data).getExtras()).get("data");

            int width = photo.getWidth();
            int height = photo.getHeight();

            // display this bitmap in imageview
            imageView.setImageBitmap(photo);

            // pass this bitmap to classifier to make prediction
            List<ImageClassifier.Recognition> predictions = imageClassifier.recognizeImage(
                    photo, 0);

            // creating a list of string to display in list view
            final List<String> predicitonsList = new ArrayList<>();
            for (ImageClassifier.Recognition recog : predictions) {
                predicitonsList.add(recog.getName() + "  ::::::::::  " +
recog.getConfidence());
            }

            // creating an array adapter to display the classification result in list view
            ArrayAdapter<String> predictionsAdapter = new ArrayAdapter<>(
                    this, R.layout.support_simple_spinner_dropdown_item, predicitonsList);
            listView.setAdapter(predictionsAdapter);
        }
    }
```

Rezultate


GuessMyAge App
61-75 ..... 0.84313726
46-60 ..... 0.15294118
04-06 ..... 0.0
07-08 ..... 0.0
09-11 ..... 0.0
TAKE PICTURE
OPEN GALLERY
GuessMyAge App
46-60 ..... 0.36078432
12-19 ..... 0.3372549
20-27 ..... 0.2
61-75 ..... 0.039215688
09-11 ..... 0.023529412
TAKE PICTURE
OPEN GALLERY
GuessMyAge App
12-19 ..... 0.58431375
09-11 ..... 0.15294118
07-08 ..... 0.13333334
20-27 ..... 0.05882353
04-06 ..... 0.03529412
TAKE PICTURE
OPEN GALLERY
GuessMyAge App
04-06 ..... 0.3882353
12-19 ..... 0.3254902
07-08 ..... 0.14117648
09-11 ..... 0.14117648
20-27 ..... 0.003921569
TAKE PICTURE
OPEN GALLERY
GuessMyAge App
04-06 ..... 0.57254905
07-08 ..... 0.2
09-11 ..... 0.11764706
12-19 ..... 0.10980392
20-27 ..... 0.003921569
TAKE PICTURE
OPEN GALLERY



Guess My Age

Vă mulțumesc!