

Project 7 Android Face recognition

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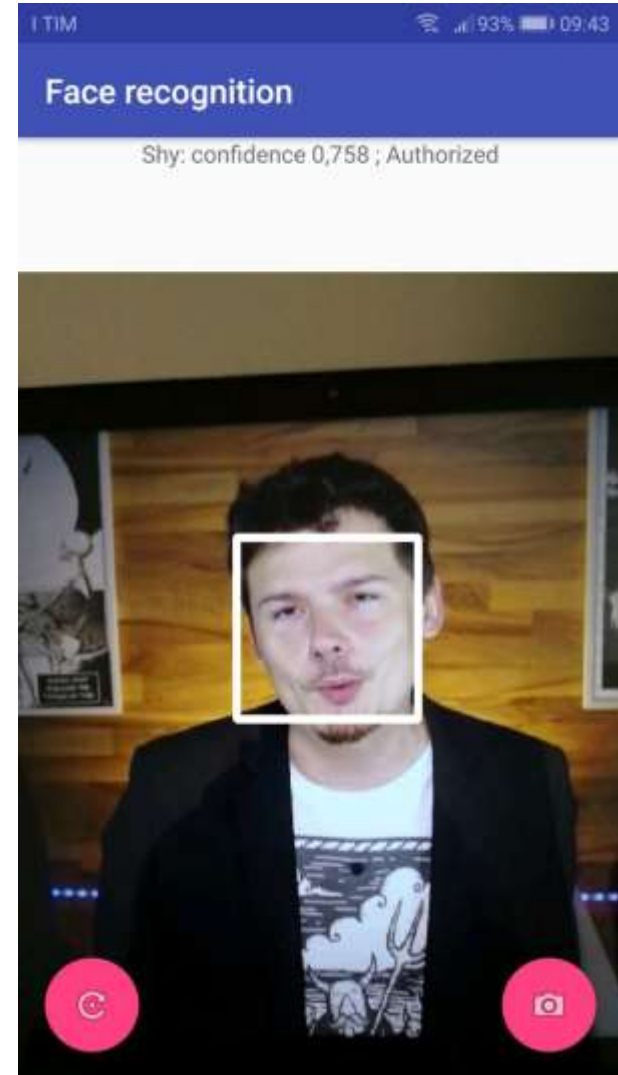
Summary

- Android implementation of face recognition using OpenCV
- Face detection with Haar Cascade Classifier
- Face features extracted using VGG2
- Classification performed with weighted kNN

- User interface
 - Live face recognition
 - View database contents
 - Add identities
 - From pictures or videos
 - From faces collected during live recognition
 - With optional clustering

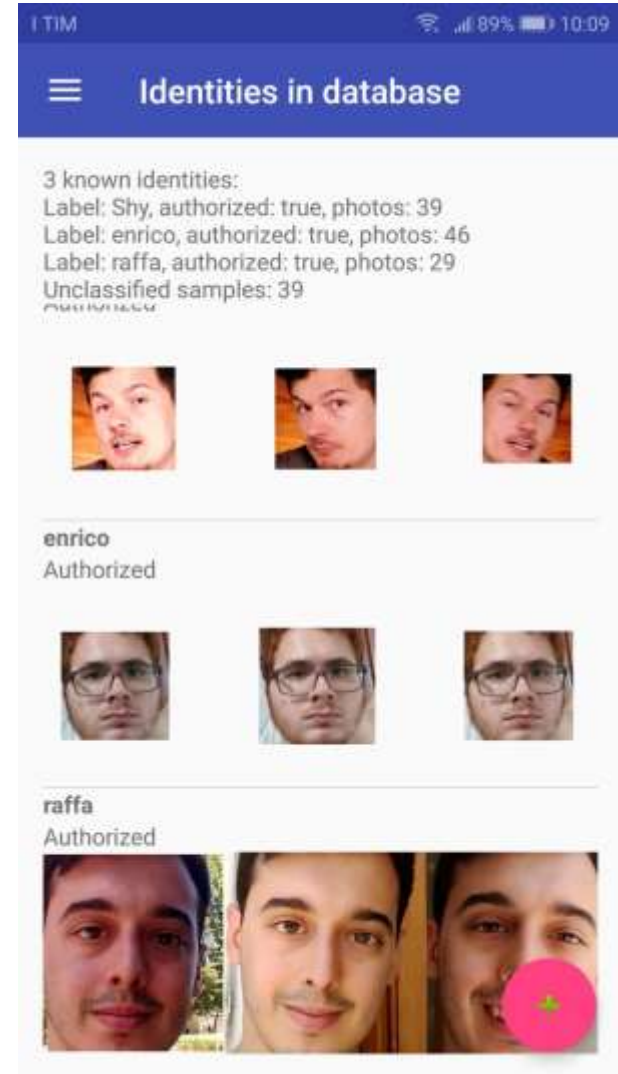
Main activity: live face recognition

- Camera feed shows detected faces with boxes
- Labeling is shown in the textbox
- To improve performance, the two operations are independent and run at their best rates
- Distinction between *unknown* and *unclassified*
 - In both cases the face is recorded to database



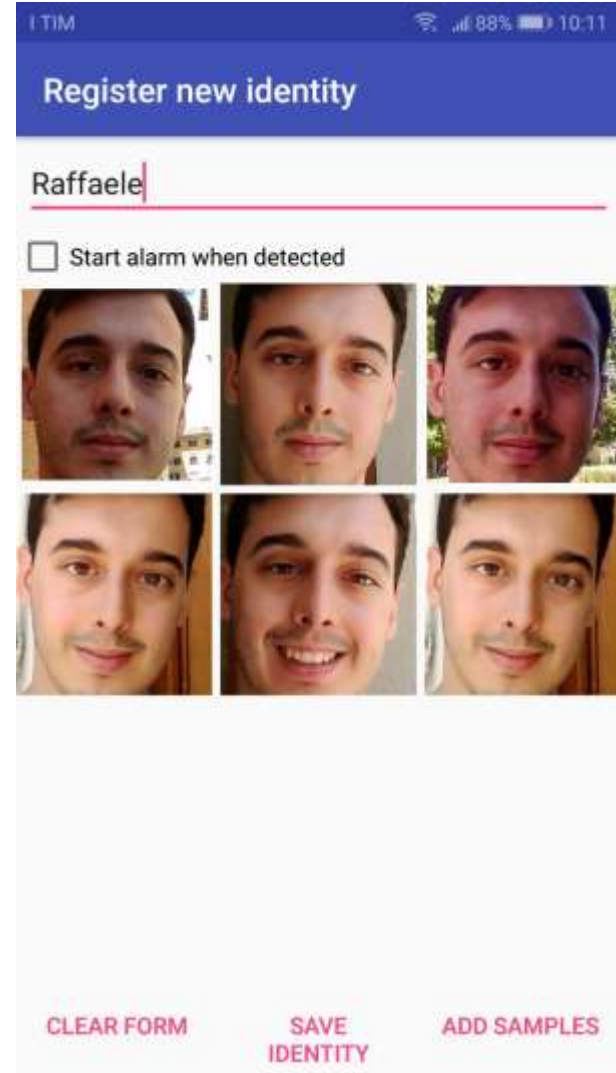
Identity view activity

- Display the current state of the database
- Database utils
 - Import/export
 - Clear



Add identity activity

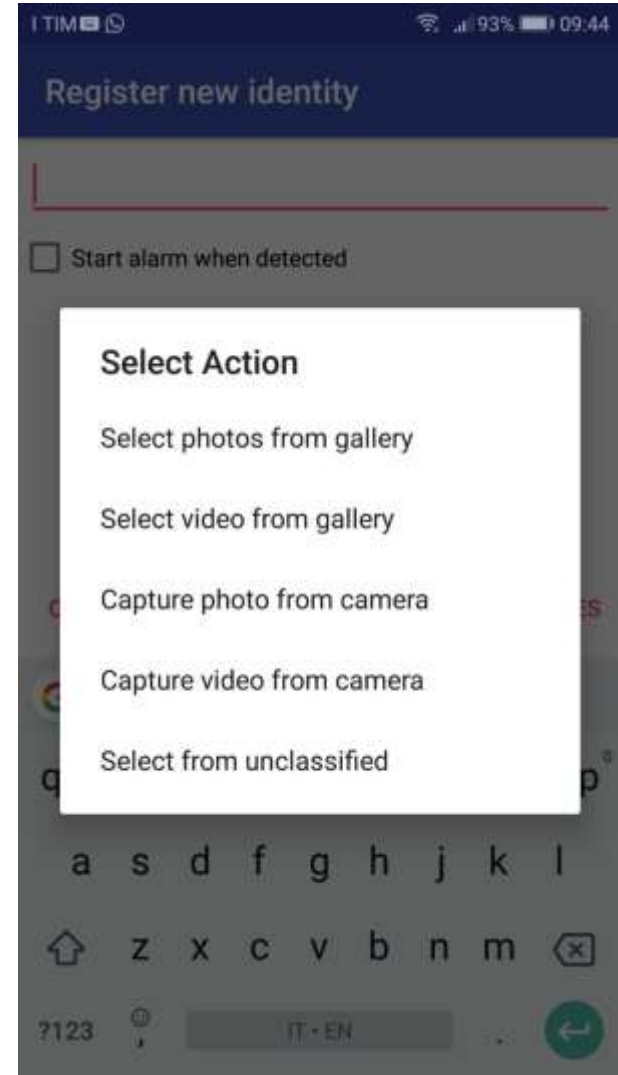
- Interface to add a new identity to the database
- Can add samples from multiple sources
 - Pictures and videos from gallery
 - Pictures and videos from camera
 - Unclassified faces from live face recognition
- Can be used to add samples to an already existing identity



The screenshot shows a mobile application interface for registering a new identity. At the top, the status bar displays 'TIM', signal strength, 88% battery, and the time 10:11. The app's title bar is blue with the text 'Register new identity'. Below the title bar, there is a text input field containing the name 'Raffaele'. Underneath the input field is a checkbox labeled 'Start alarm when detected'. The main area of the screen is filled with a grid of six face images of a man, arranged in two rows of three. At the bottom of the screen, there are three buttons: 'CLEAR FORM', 'SAVE IDENTITY', and 'ADD SAMPLES'.

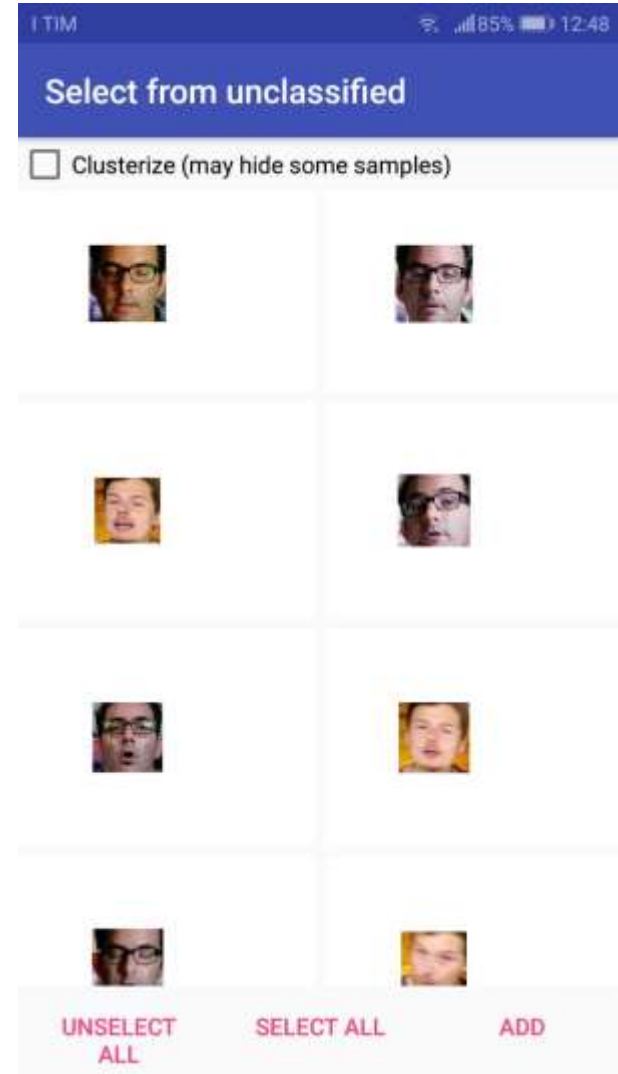
Add identity activity

- Interface to add a new identity to the database
- Can add samples from multiple sources
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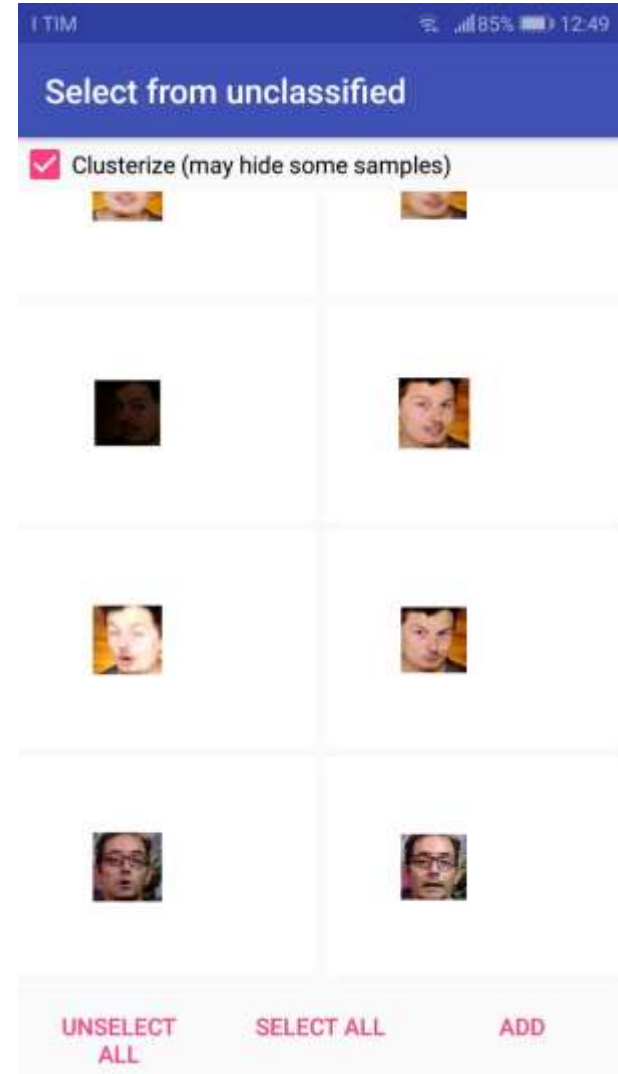
Select from unclassified activity

- Shows unclassified faces collected during live face recognition
- Which can be selected to create a new identity
- Optional clustering
 - Hides non-clustered samples
 - Based on DBSCAN



Select from unclassified activity

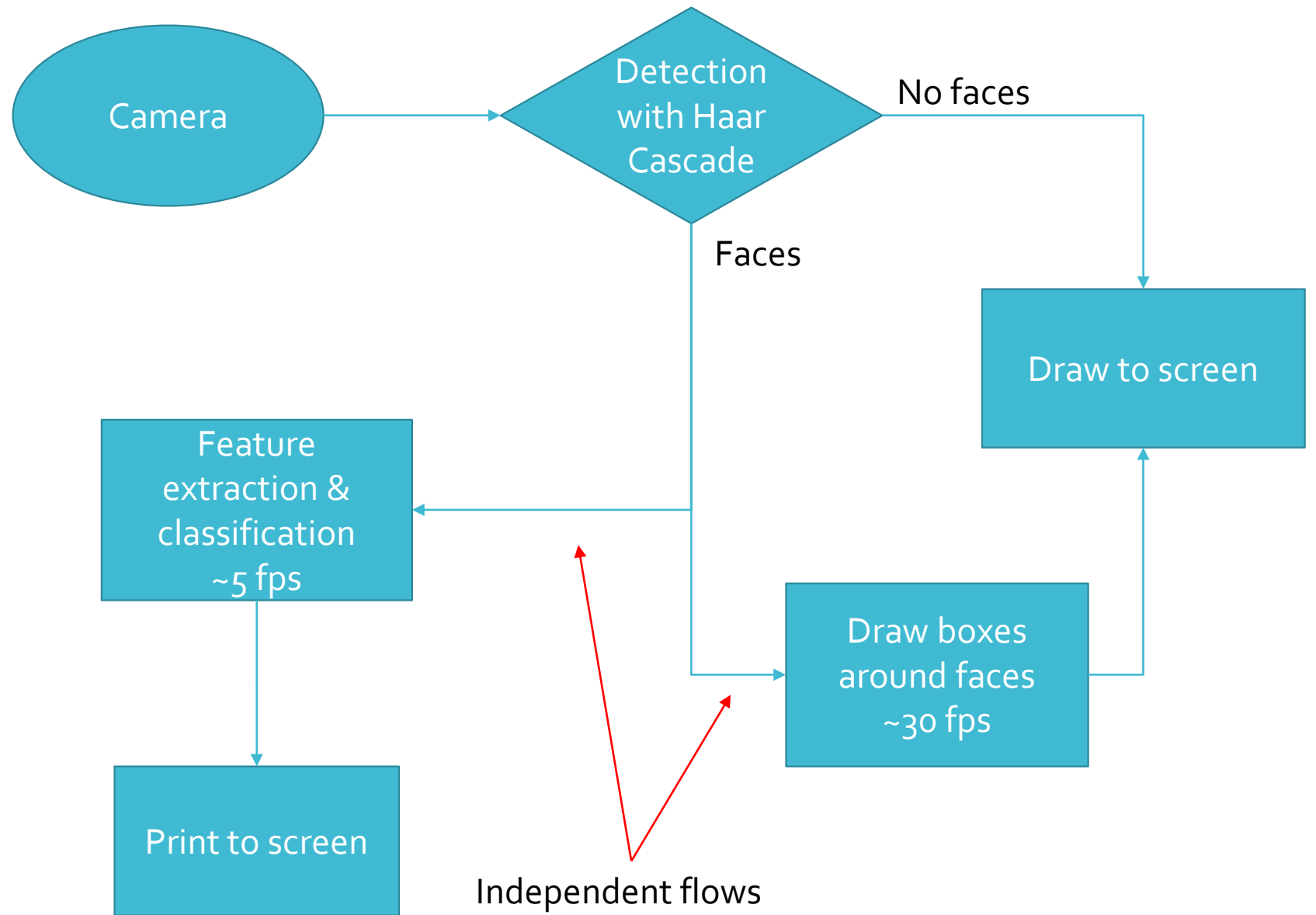
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Implementation overview

- Implemented on Android using Java
- Using OpenCV for Android library
- Live camera feed implemented with Camera2 APIs
- DBSCAN implementation from Apache Math Commons library
- Object-based face database serialized to internal memory when modified

Live face recognition pipeline





Live demo