Project 7 Android Face recognition

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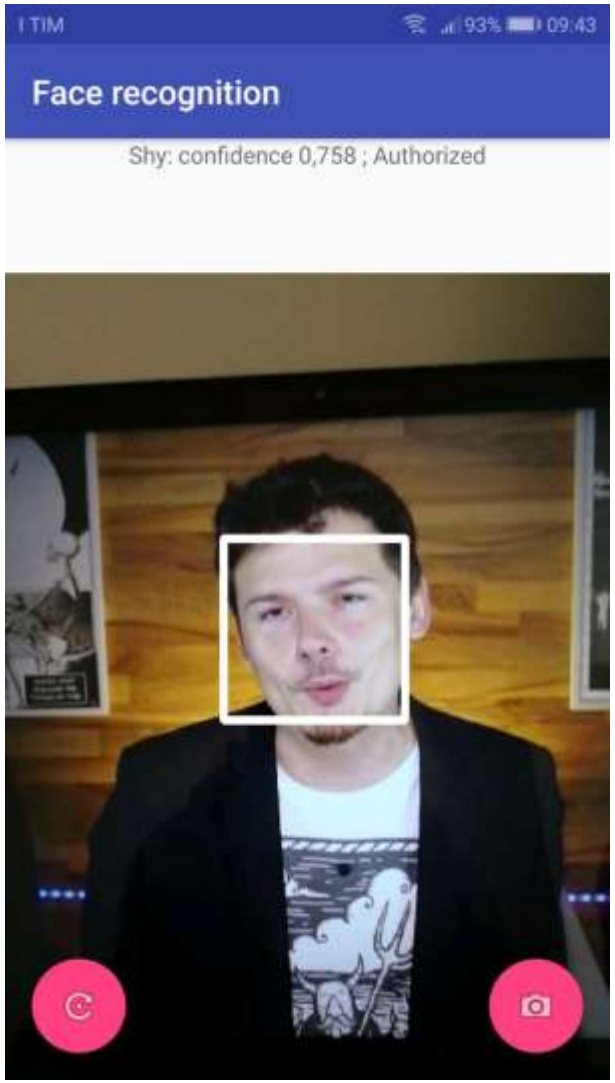
Summary

- 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

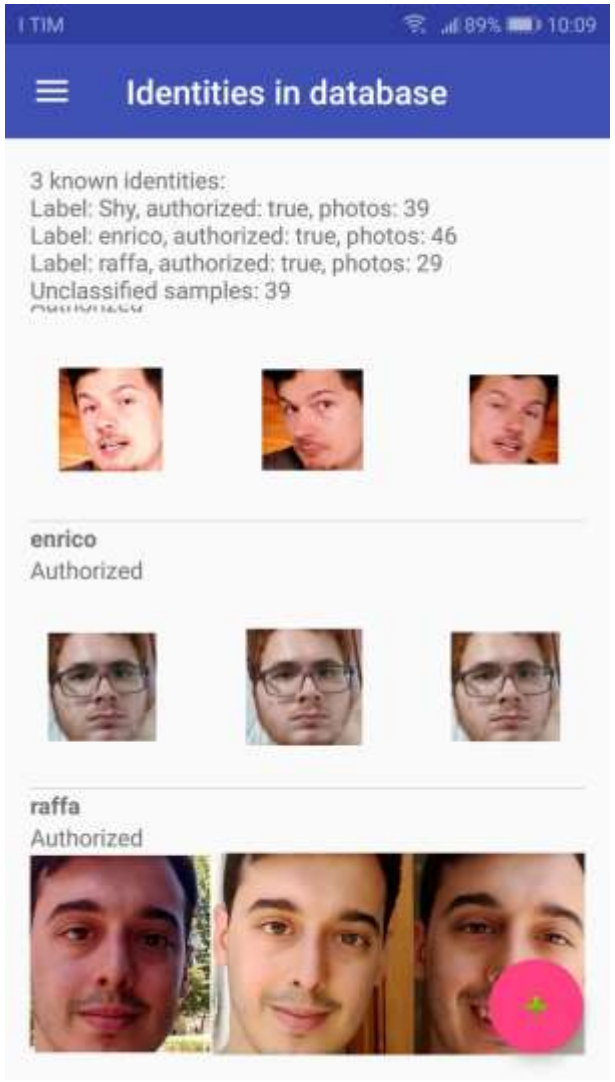
Main activity: live face recognition

- 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



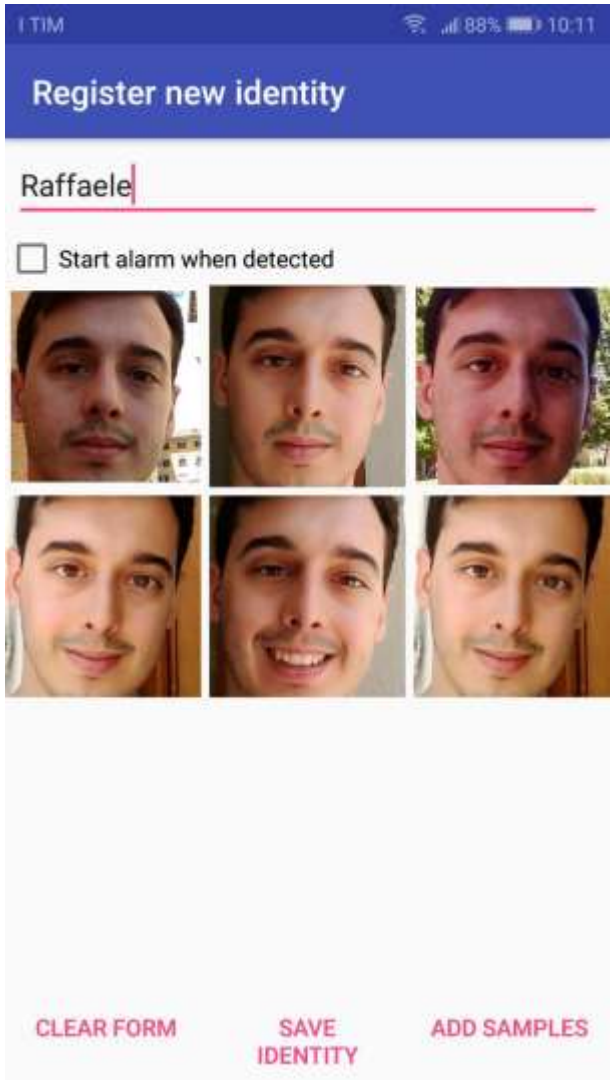
Identity view activity

- 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



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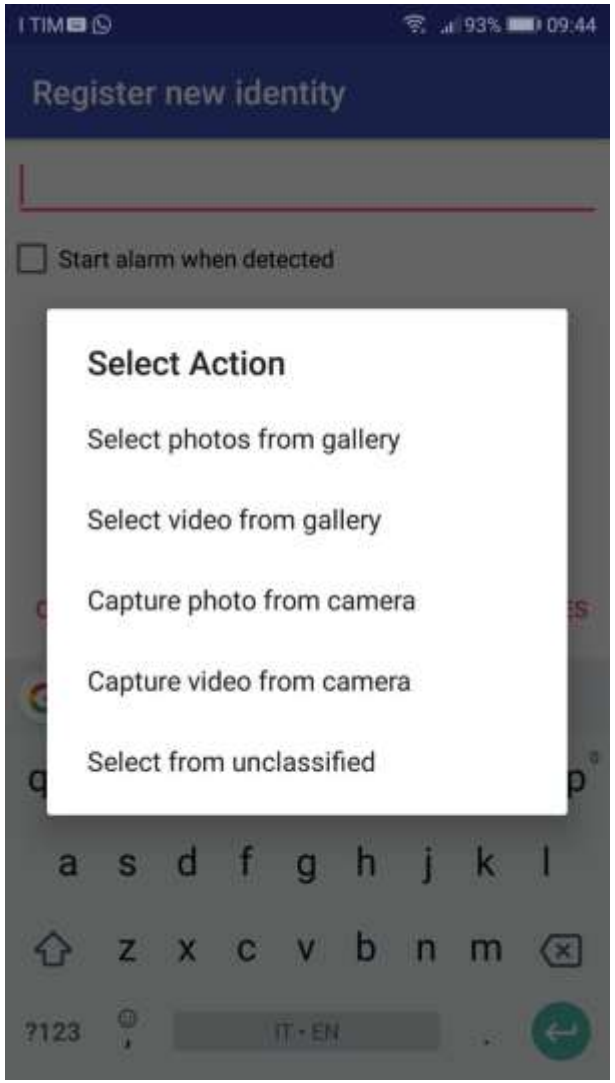
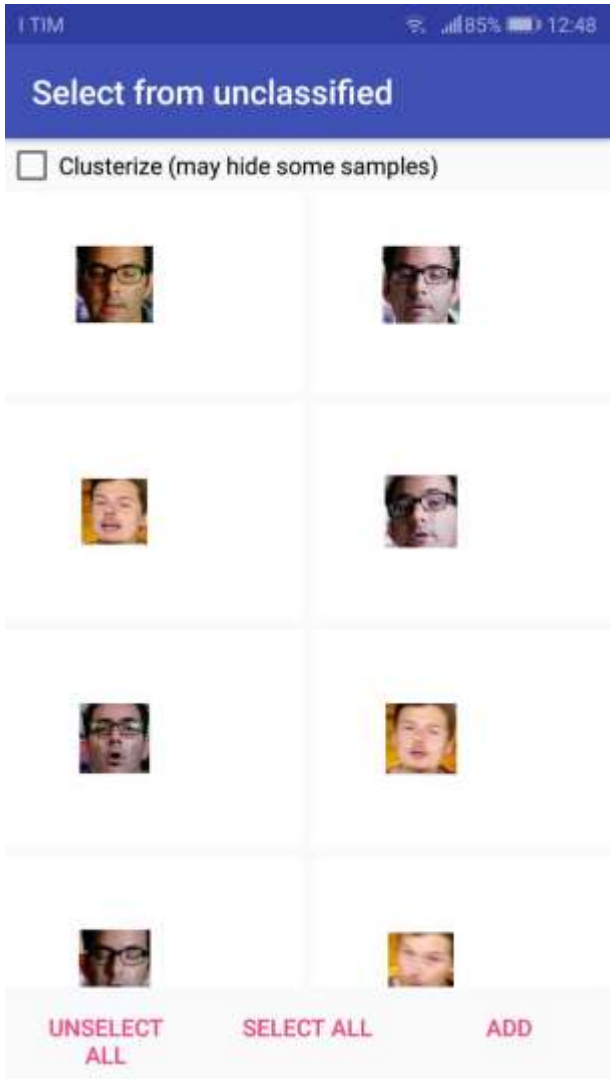


Select from unclassified activity

- 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



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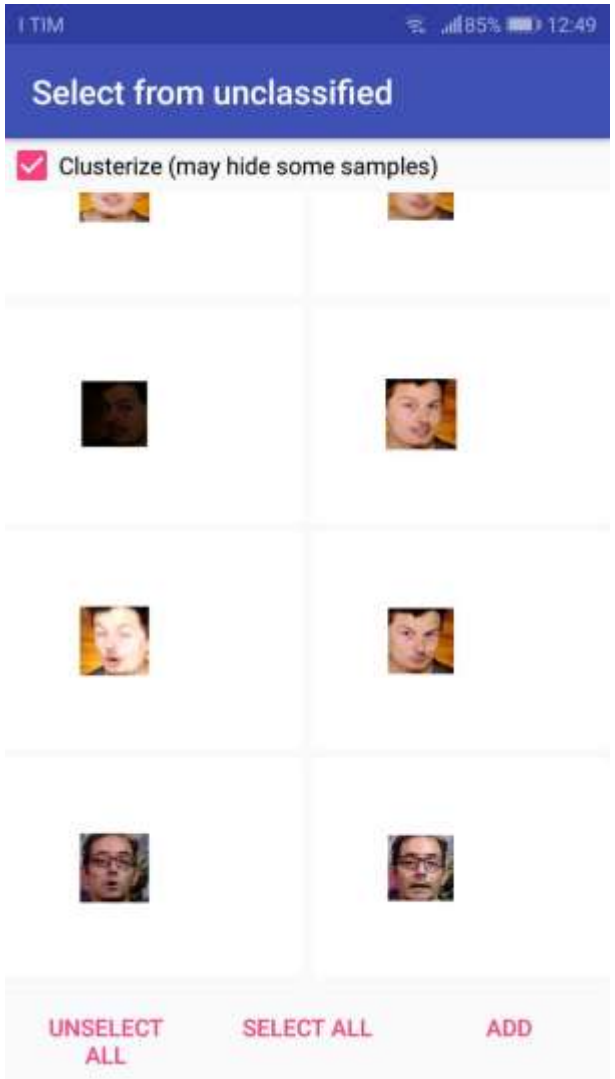
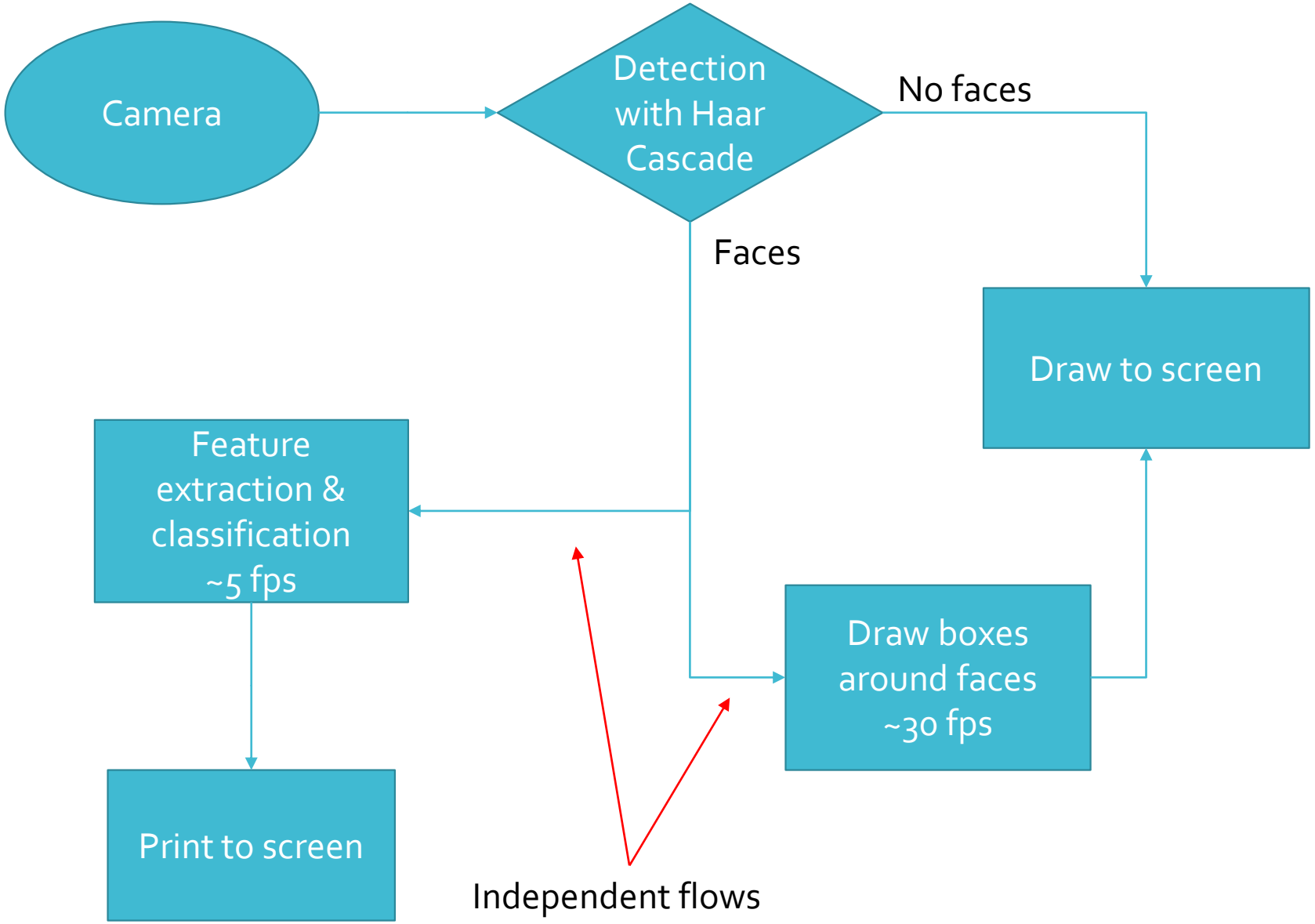


Implementation overview

- 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