# Android - Camera

- Application to demonstrate the use of camera in android.
- A `SurfaceView` is created for the camera preview.
- `SurfaceHolder.Callback` is used to get notifications about the changes in the surface.
  - o `surfaceCreated()`
    - called immediately after the surface is first created
  - o `surfaceChanged()`
    - when there are any structural changes to the surface
  - o `surfaceDestroyed()`
    - called just before the surface is being destroyed

- The `CAMERA` permissions should be declared in the `AndroidManifest.xml` file to access the camera device.
- `<uses-feature>` element is used to declare the features of the camera that will be used by the application.

- An instance of camera is obtained using `open()`
- Default `Camera.Parameters` can be obtained and modified using `getParameters()` and `setParameters()`
- `setPreviewDisplay()` sets the surface required for the camera preview.
  - A fully initialized `SurfaceHolder` must be passed to this method.
- `startPreview()` updates the preview surface
- `setPreviewDisplay()` must be called before calling `startPreview()`
- Preview should be started before taking a picture

- When image is captured using the button, the `takePicture()` is called which initiates a series of Callbacks for image capture.
  - A shutter callback occurs close to the moment of image capture.This callback can be used to play shutter sound
  - A raw callback occurs when raw image data is available.
  - A jpeg callback occurs when compressed image is available.
    - Image data that is available after image capture is supplied using the callback interface `PictureCallback` via `onPictureTaken()`
  - A null can be passed when a callback is not required.
- Since camera is a shared resource it is good practice to release the resource when not using it.

- Below screenshots demonstrate how the camera application is rendered on an emulator.
- Once the button is clicked, you can verify the captured image (which is typically an android icon on an emulator) by browsing to the gallery.
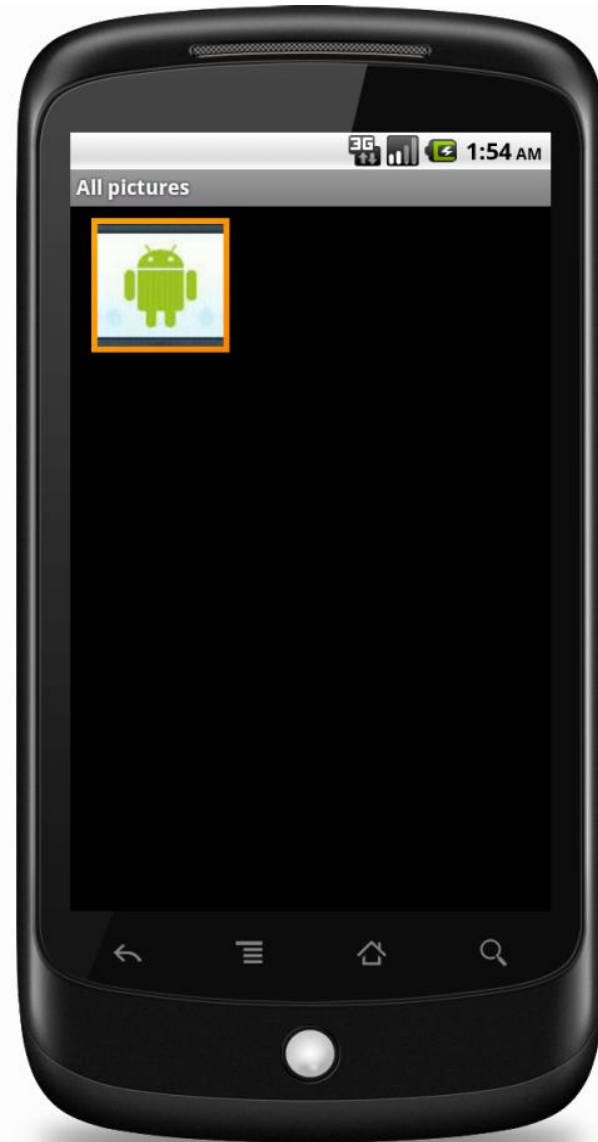
References

- Camera
- Camera Parameters
- SurfaceHolder
- SurfaceView
- SurfaceHolder Callback
- ShutterCallback
- PictureCallback

Exercise

- Change the application such that the picture is taken with the front camera instead of the back camera (assume that the device supports both front and back camera).