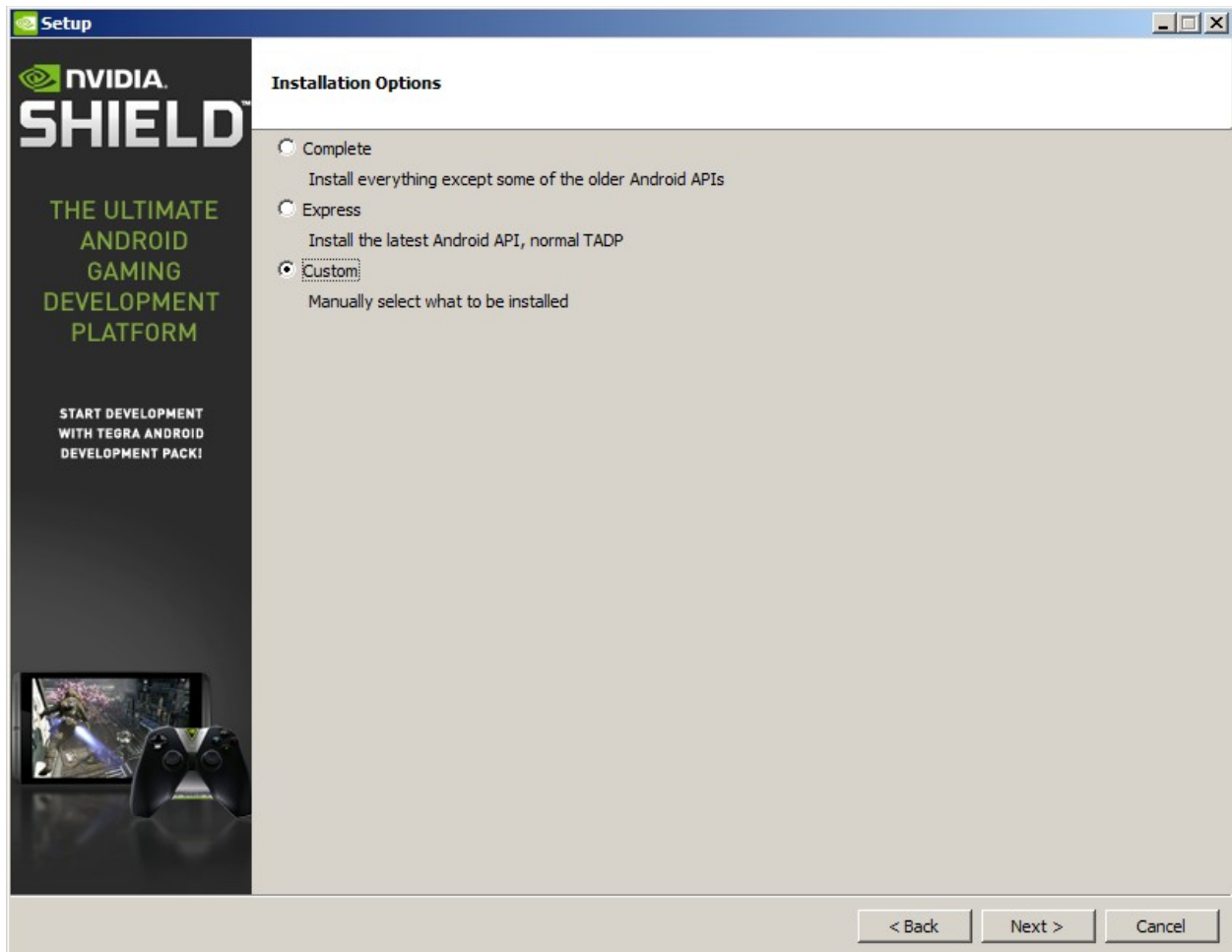


Chapter 1: Getting Yourself Ready




Setup

NVIDIA SHIELD™

THE ULTIMATE ANDROID GAMING DEVELOPMENT PLATFORM

START DEVELOPMENT WITH TEGRA ANDROID DEVELOPMENT PACK!



Select Components

Select the components you want to install; clear the components you do not want to install. Click Next when you are ready to continue.

- Tegra Android Development Pack
 - Android SDK r23.0.2
 - Android NDK r10c
 - JDK 1.7.0_45
 - Eclipse 4.3, CDT 8.2.0 and ADT 23.0.2
 - Apache Ant 1.8.2
 - Gradle 2.1
 - USB Driver
 - OpenCV for Tegra 2.4.8.2
 - PerfHUD ES 2.2.0
 - Tegra Graphics Debugger 1.3
 - Tegra System Profiler 2.2
 - PhysX 3,3.0 for Android
 - Samples
 - Tegra Samples
 - NVIDIA GameWorks™ Samples 2.0
 - NVIDIA PerfKit
 - Documentation
 - NVIDIA Nsight Tegra 2.0 Visual Studio Edition
- Tegra Android OS
 - For Ardbeg KitKat (4.4)
- Post Setup
 - Compile Samples and Install to device

< Back Next > Cancel

Android SDK Manager

Packages Tools

SDK Path: C:\NVPACK\android-sdk-windows

Packages

Name	API	Rev.	Status
Tools			
Android 5.0.1 (API 21)			
Android 4.4W.2 (API 20)			
Android 4.4.2 (API 19)			
SDK Platform	19	4	Installed
Samples for SDK	19	6	Not installed
ARM EABI v7a System Image	19	2	Not installed
Intel x86 Atom System Image	19	2	Not installed
Google APIs (x86 System Image)	19	10	Not installed
Google APIs (ARM System Image)	19	10	Not installed
Glass Development Kit Preview	19	11	Not installed
Sources for Android SDK	19	2	Not installed
Android 4.3.1 (API 18)			
SDK Platform	18	3	Installed
Samples for SDK	18	1	Not installed
ARM EABI v7a System Image	18	2	Not installed
Intel x86 Atom System Image	18	1	Not installed
Google APIs	18	3	Not installed
Sources for Android SDK	18	1	Not installed
Android 4.2.2 (API 17)			
SDK Platform	17	3	Installed
Samples for SDK	17	1	Not installed
ARM EABI v7a System Image	17	2	Not installed
Intel x86 Atom System Image	17	1	Not installed
MIPS System Image	17	1	Not installed
Google APIs	17	3	Not installed

Show: Updates/New Installed Obsolete Select [New](#) or [Updates](#)

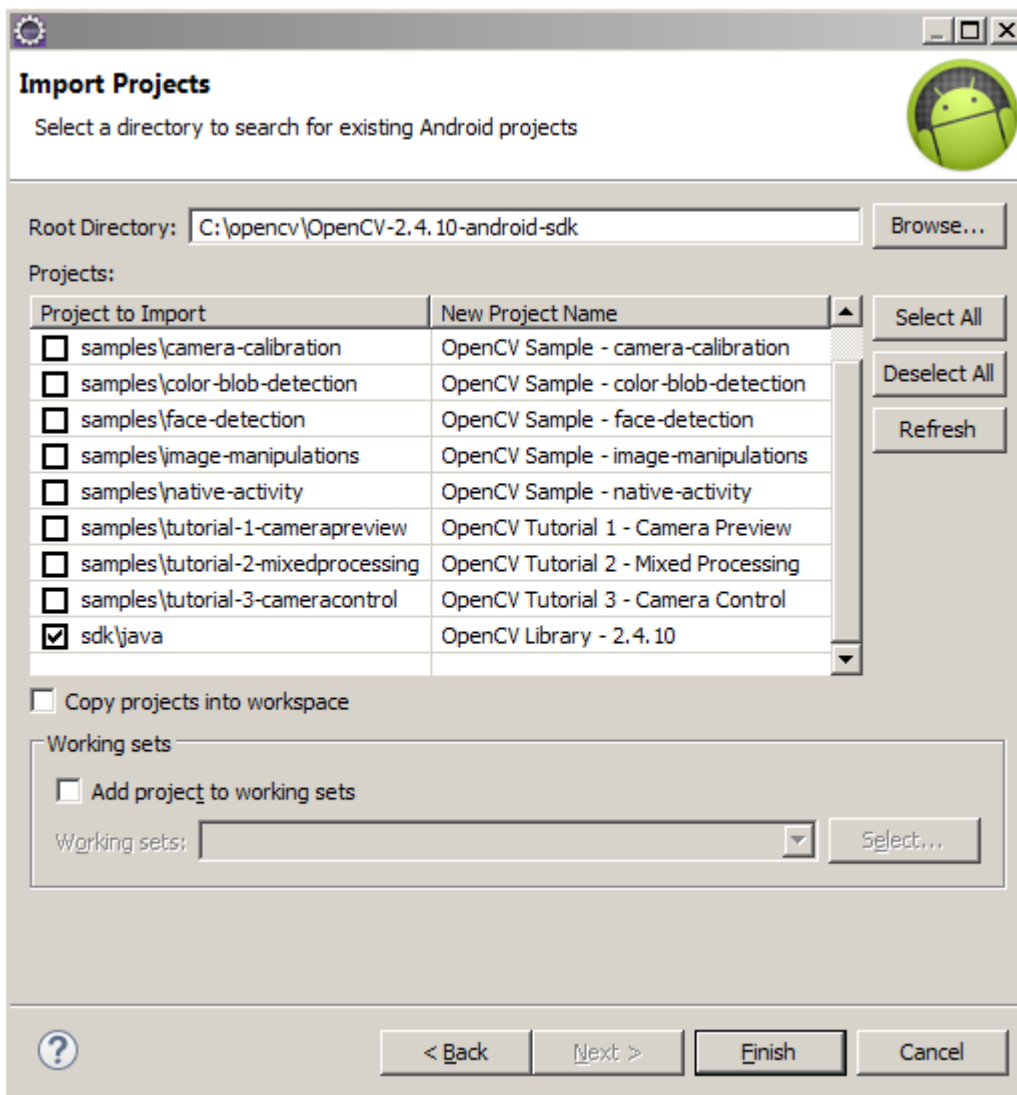
Sort by: API level Repository [Deselect All](#)

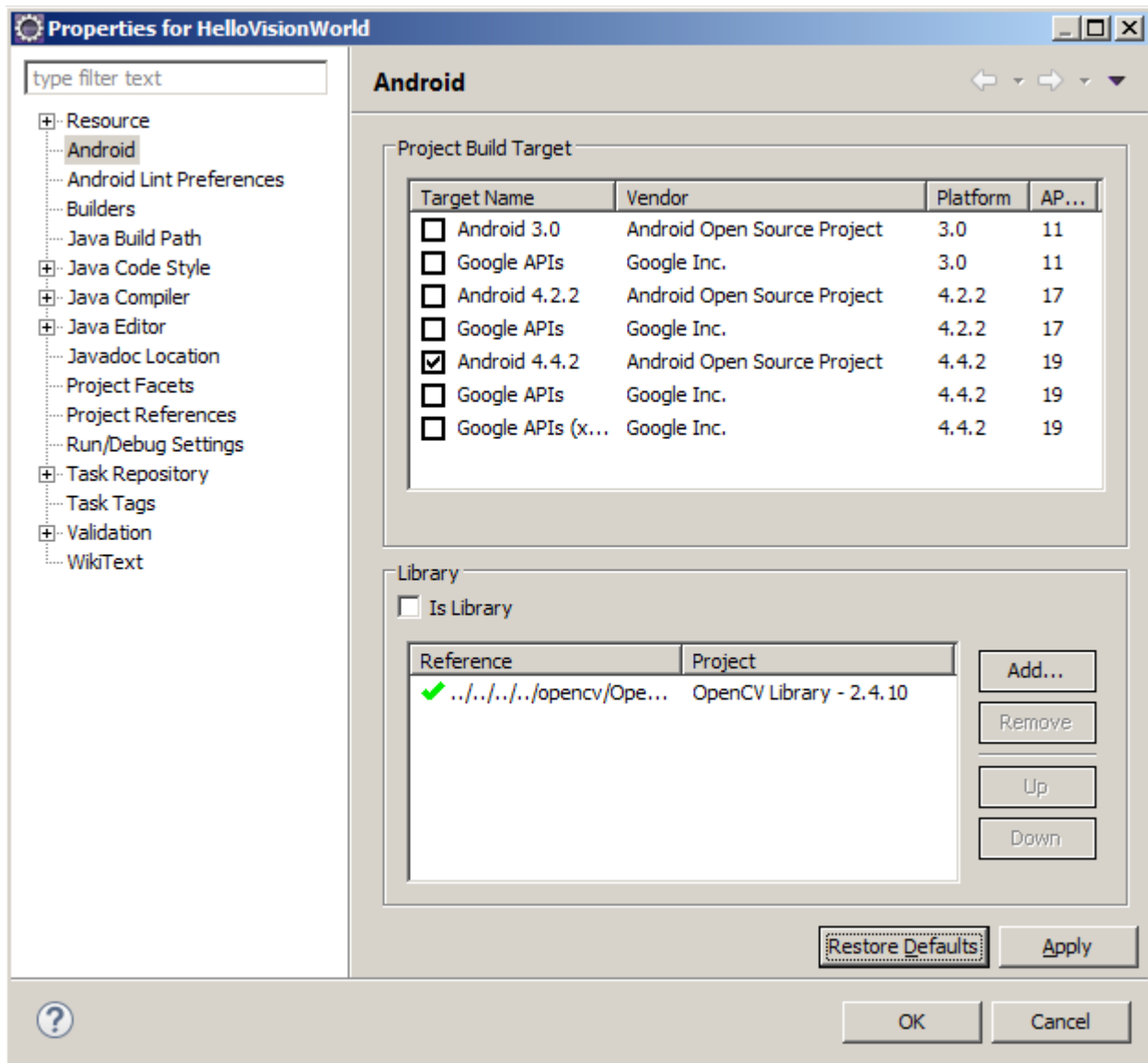
Install 20 packages...

Delete 3 packages...



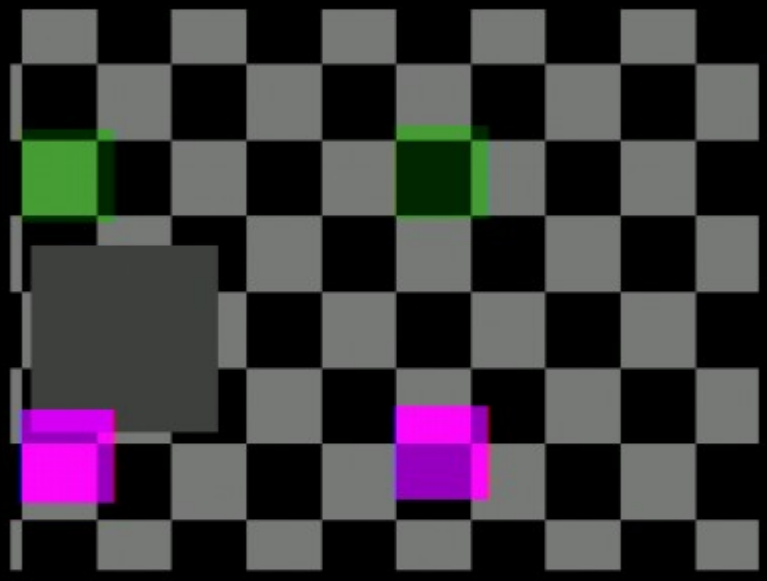
```
C:\windows\system32\cmd.exe
C:\android\android-ndk-r10d\samples\hello-jni>ndk-build
Android NDK: WARNING: APP_PLATFORM android-15 is larger than android:minSdkVersion 3 in ./AndroidManifest.xml
[arm64-v8a] Gdbserver      : [aarch64-linux-android-4.9] libs/arm64-v8a/gdbserver
[arm64-v8a] Gdbsetup      : libs/arm64-v8a/gdb.setup
[x86_64] Gdbserver       : [x86_64-4.9] libs/x86_64/gdbserver
[x86_64] Gdbsetup        : libs/x86_64/gdb.setup
[mips64] Gdbserver       : [mips64el-linux-android-4.9] libs/mips64/gdbserver
[mips64] Gdbsetup        : libs/mips64/gdb.setup
[armeabi-v7a] Gdbserver   : [arm-linux-androideabi-4.6] libs/armeabi-v7a/gdbserver
[armeabi-v7a] Gdbsetup   : libs/armeabi-v7a/gdb.setup
[armeabi] Gdbserver      : [arm-linux-androideabi-4.6] libs/armeabi/gdbserver
[armeabi] Gdbsetup      : libs/armeabi/gdb.setup
[x86] Gdbserver          : [x86-4.6] libs/x86/gdbserver
[x86] Gdbsetup           : libs/x86/gdb.setup
[mips] Gdbserver         : [mipsel-linux-android-4.6] libs/mips/gdbserver
[mips] Gdbsetup          : libs/mips/gdb.setup
[arm64-v8a] Install      : libhello-jni.so => libs/arm64-v8a/libhello-jni.so
[x86_64] Install         : libhello-jni.so => libs/x86_64/libhello-jni.so
[mips64] Install         : libhello-jni.so => libs/mips64/libhello-jni.so
[armeabi-v7a] Install    : libhello-jni.so => libs/armeabi-v7a/libhello-jni.so
[armeabi] Install       : libhello-jni.so => libs/armeabi/libhello-jni.so
[x86] Install            : libhello-jni.so => libs/x86/libhello-jni.so
[mips] Install           : libhello-jni.so => libs/mips/libhello-jni.so
C:\android\android-ndk-r10d\samples\hello-jni>
```





5554:AVD_for_Galaxy_Nexus_by_Go

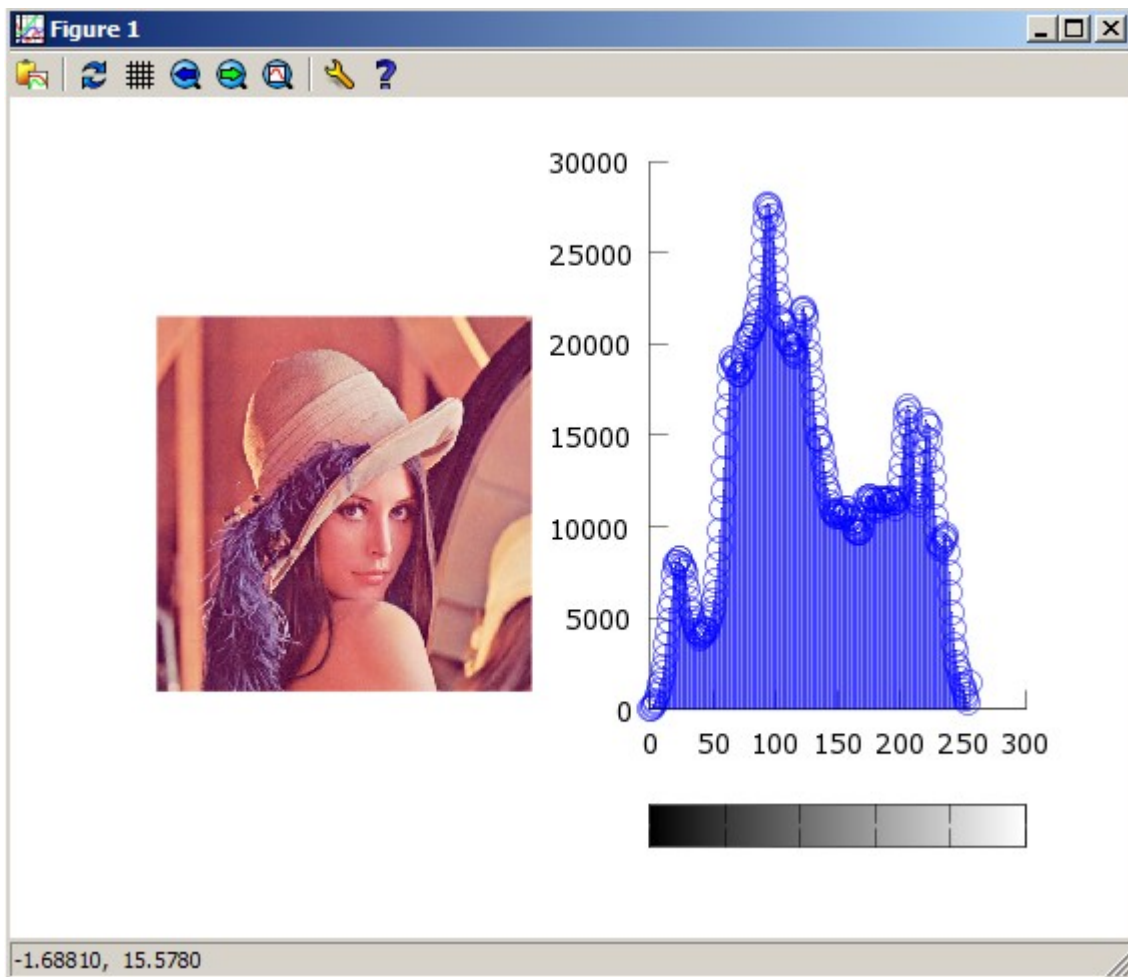
1.77 FPS@640x480



Chapter 2: App 1 - Building Your Own Darkroom

$$2^8$$

$$8 \times 3 (RGB) = 24 \text{ megabyte}$$

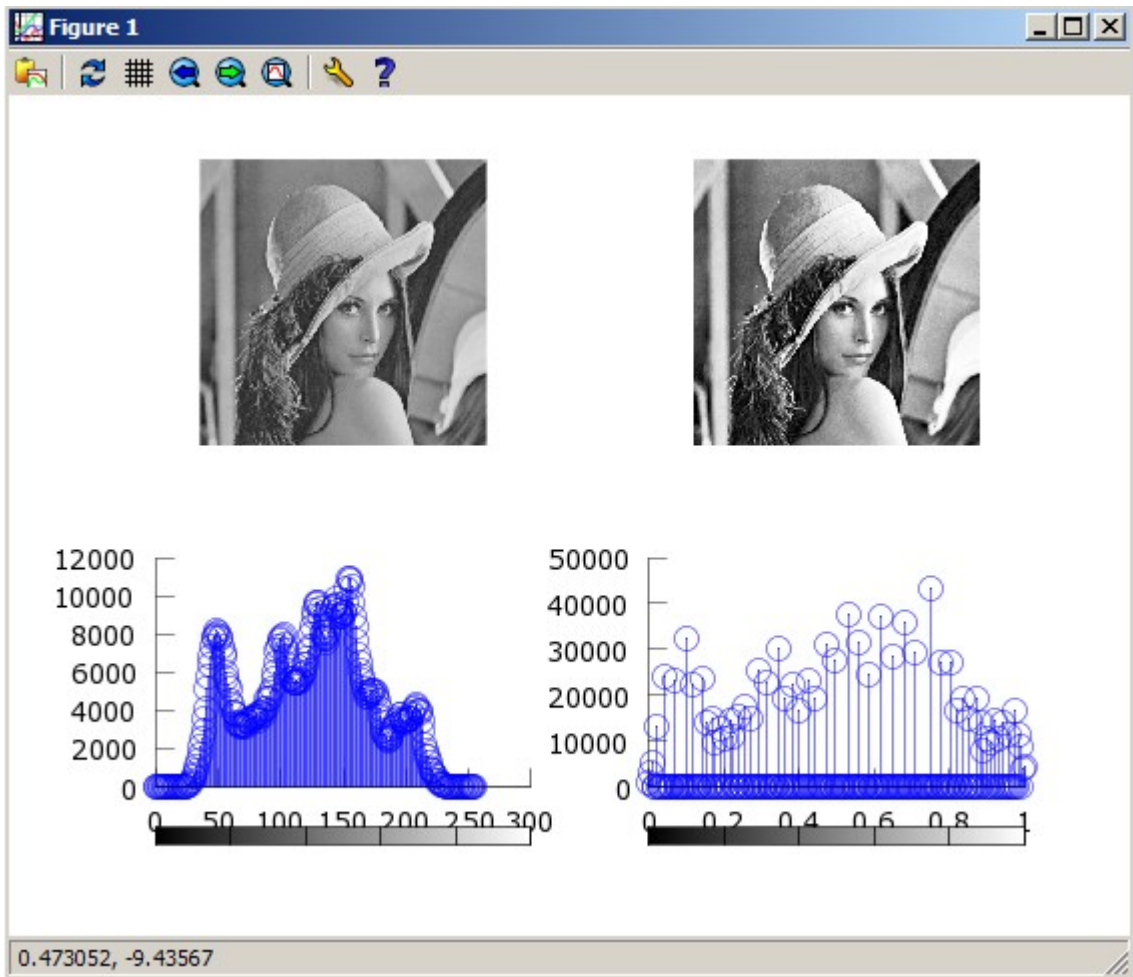


$$1 \times 1 \times 1 (\text{rows} \times \text{columns} \times \text{channels})$$

$$1 \times 1 \times \text{number of bins}$$

2x1x1



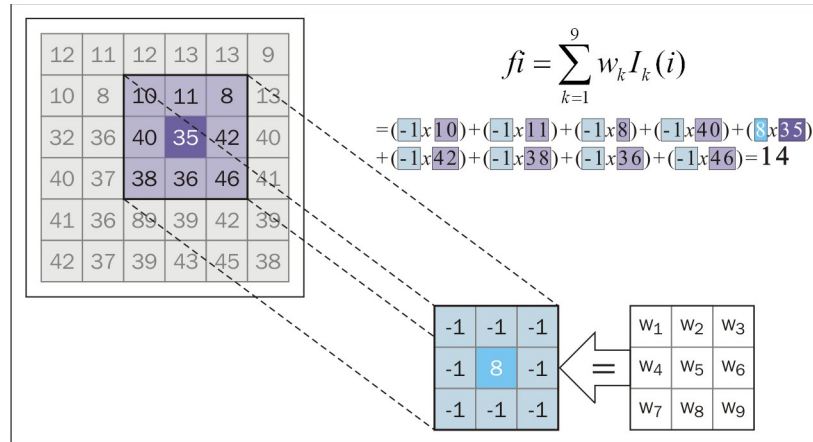








Chapter 3: App 2 - Software Scanner



k

3×3

$$k = \frac{1}{9} \times \begin{bmatrix} 1 & 1 & 1 \\ 1 & 1 & 1 \\ 1 & 1 & 1 \end{bmatrix}$$

3×3

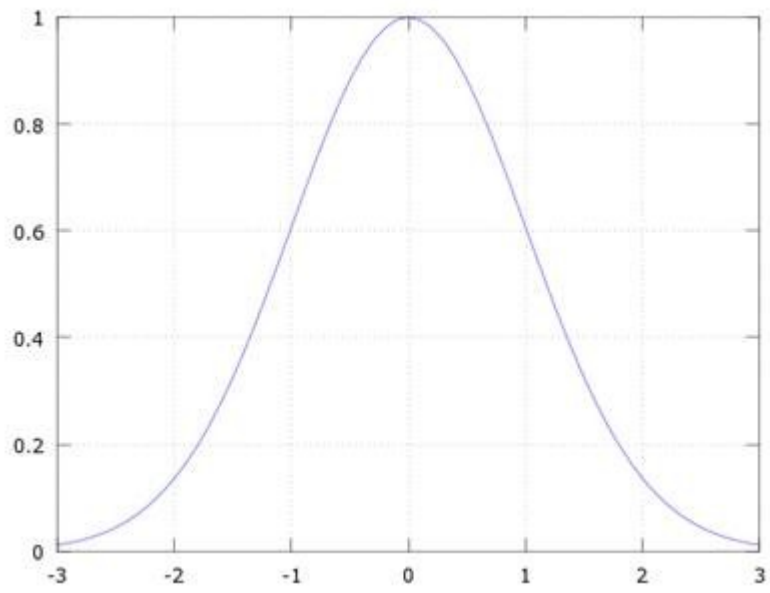
$$f(x) = ae^{-\frac{(x-b)^2}{2c^2}}$$

a

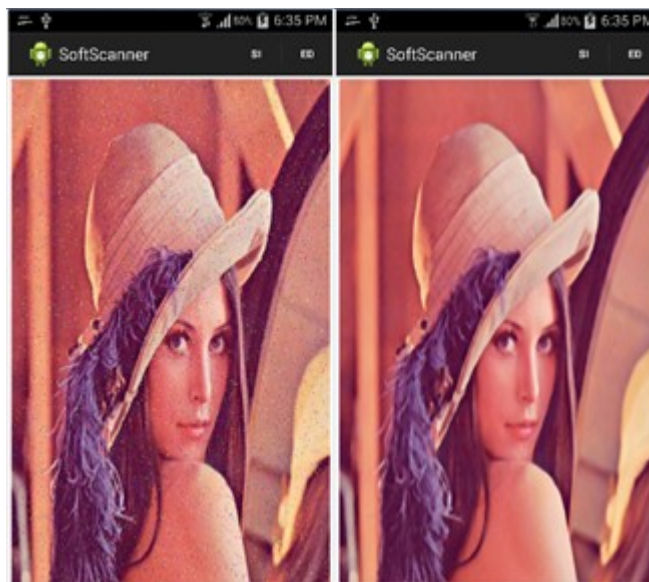
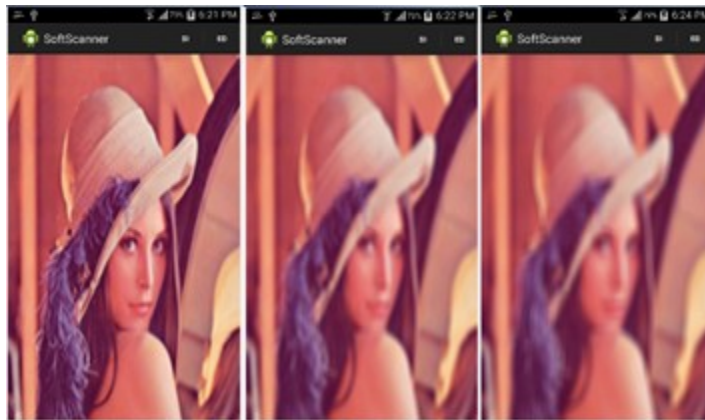
b

c

$$a = 1, b = 0, c = 1$$



7×7



$n \times n$

$1, 2, \dots, n$

$1, 2, \dots, n$

$1.1, 1.2, \dots, \text{and so on}$

$$\frac{\partial I}{\partial x} = I(x+1, y) - I(x-1, y)$$

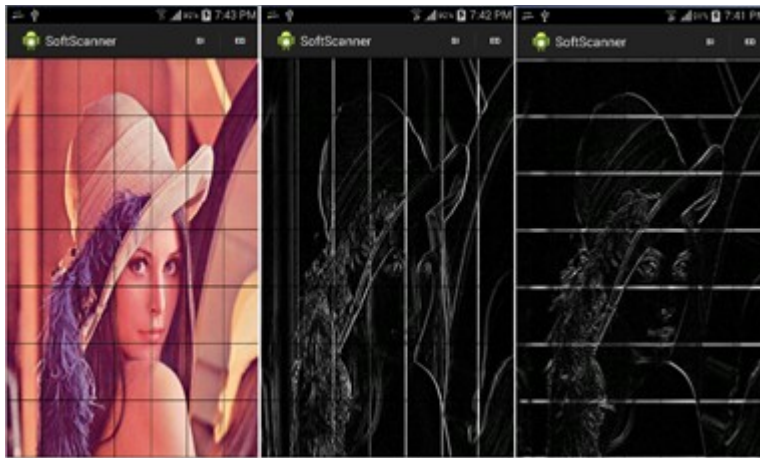
$$\frac{\partial I}{\partial y} = I(x, y+1) - I(x, y-1)$$

$$\begin{bmatrix} \frac{\partial I}{\partial x} \\ \frac{\partial I}{\partial y} \end{bmatrix}$$

$$K_x = \frac{1}{3} \times \begin{bmatrix} -1 & 0 & 1 \\ -1 & 0 & 1 \\ -1 & 0 & 1 \end{bmatrix}, K_y = \frac{1}{3} \times \begin{bmatrix} 1 & 1 & 1 \\ 0 & 0 & 0 \\ -1 & -1 & -1 \end{bmatrix}$$

K_x

K_y



$$K_x = \begin{bmatrix} -1 & 0 & 1 \\ -2 & 0 & 2 \\ -1 & 0 & 1 \end{bmatrix}$$

$$K_y = \begin{bmatrix} -1 & -2 & -1 \\ 0 & 0 & 0 \\ 1 & 2 & 1 \end{bmatrix}$$

K_x

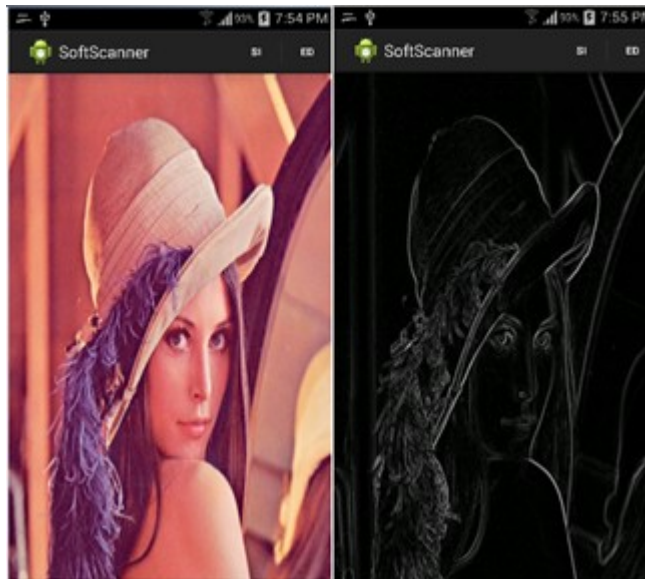
K_y

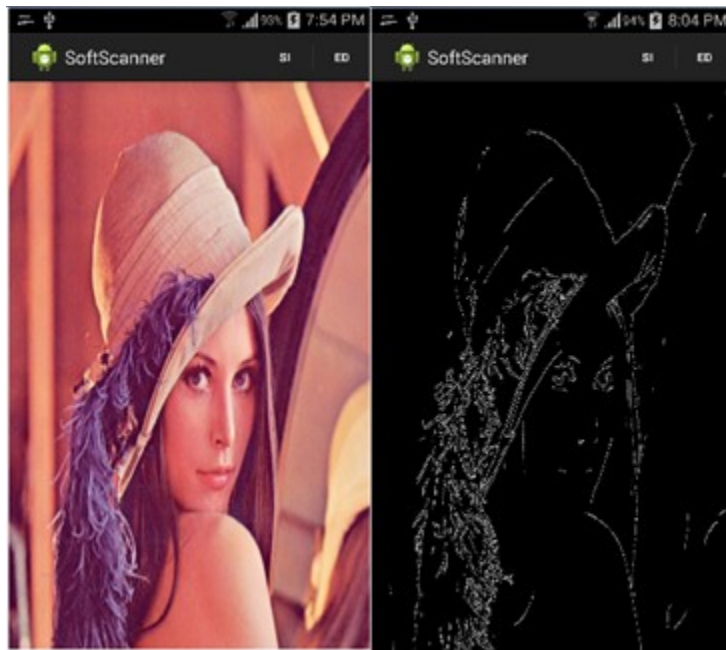
7×7

$$\text{derivative} = -255 - 0 = -255$$

$$\text{gradient magnitude} = \sqrt{f_x^2 + f_y^2}$$

f_x and f_y





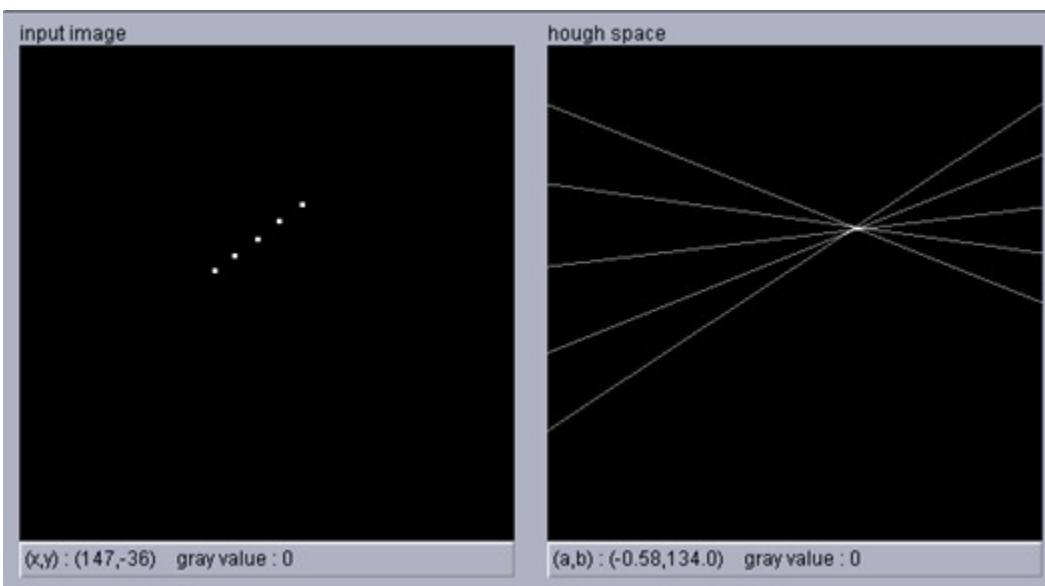
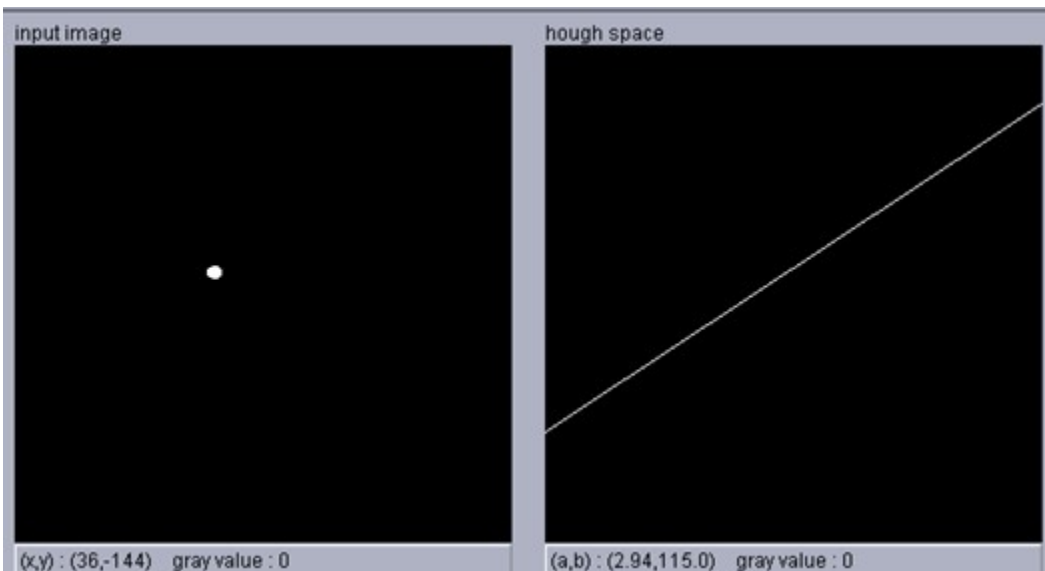
x, y

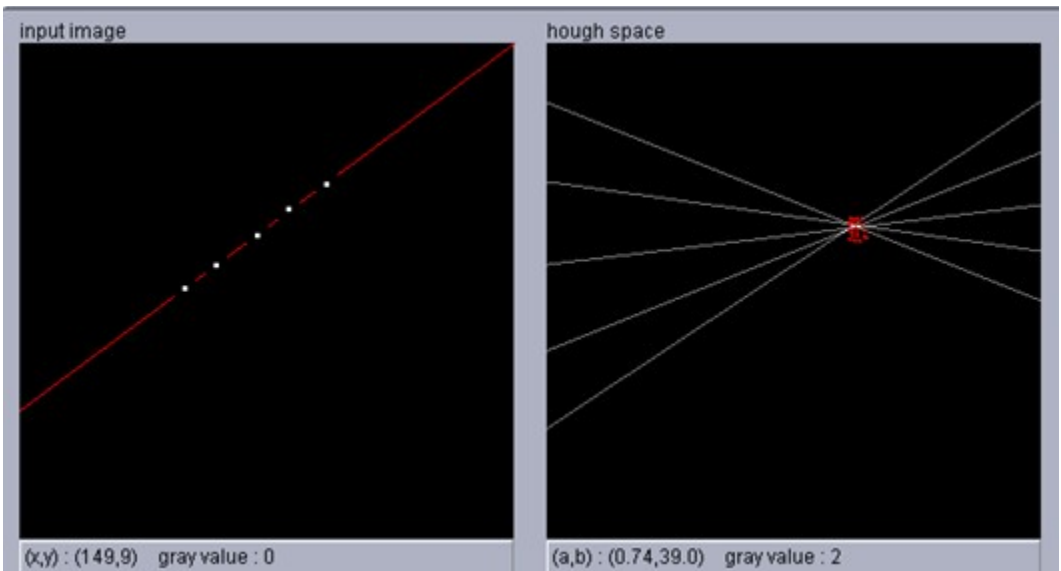
x

$$y = ax + b$$

(a)

$$b = (-x)a + y$$





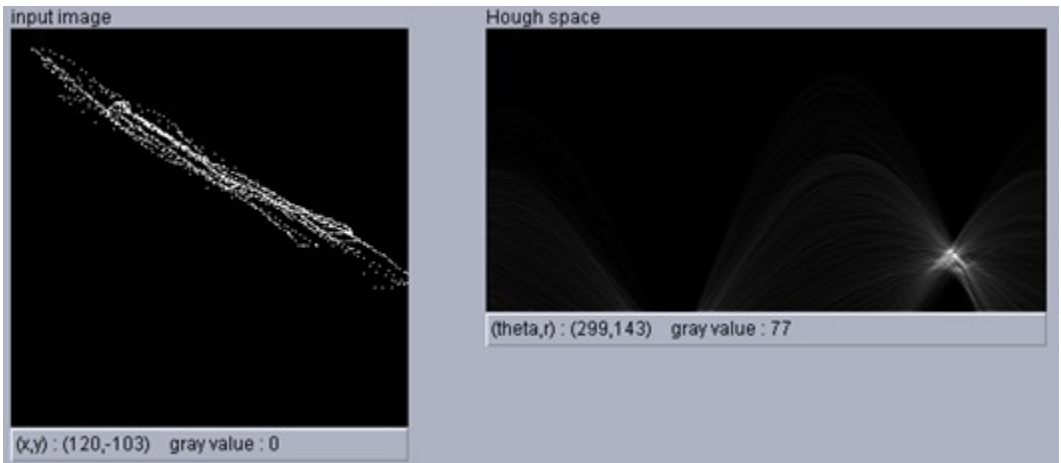
$$r = x \cos \theta + y \sin \theta$$

$r(\rho)$

θ

r

θ



r

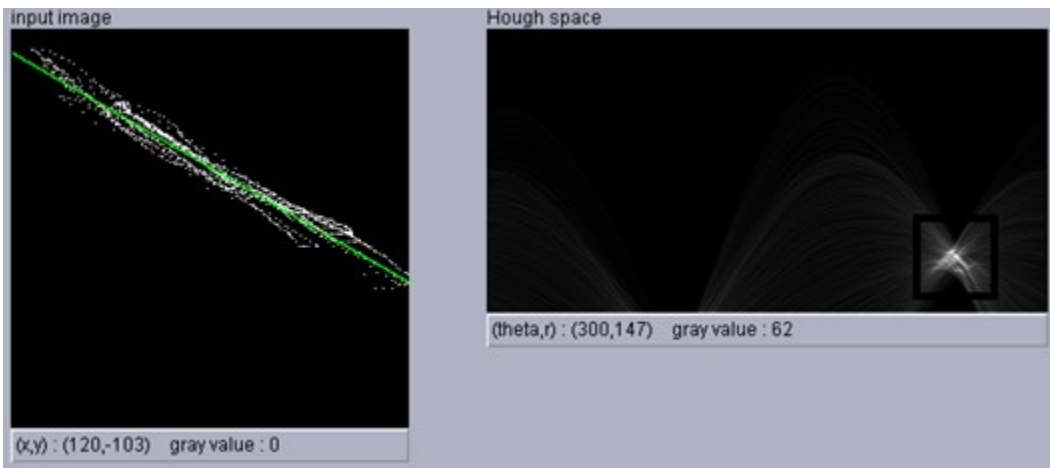
θ

x

y

r

θ



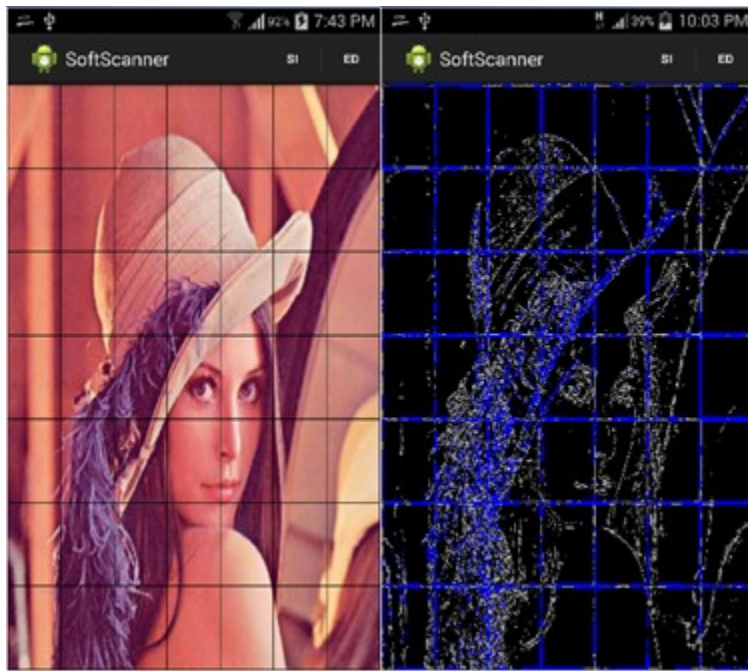
$(x_{start}, y_{start}, x_{end}, y_{end})$

ρ

θ

$\left(\frac{\pi}{180}\right)$

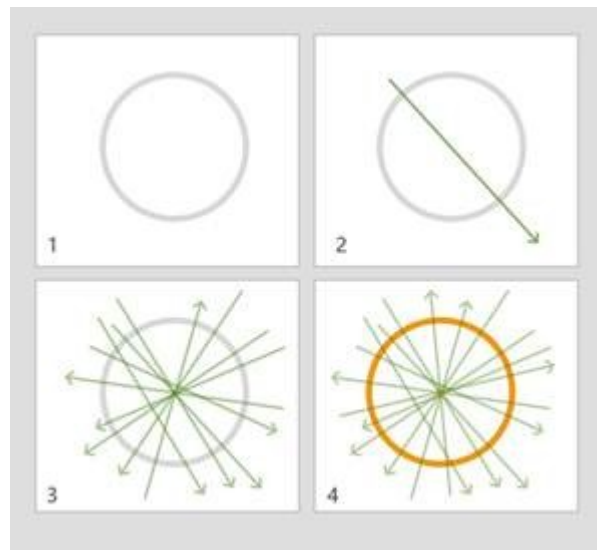
$(x_{start}, y_{start}, x_{end}, y_{end})$



x, y

$$r^2 = (x-a)^2 + (y-b)^2$$

$r, a, \text{ and } b$



$(x, y, radius)$

Chapter 4: App 2 - Applying Perspective Correction

$$t_x$$

$$t_y$$

$$p' = p + t$$

$$p' = Rp + t$$

$$R = \begin{bmatrix} \cos \theta & -\sin \theta \\ \sin \theta & \cos \theta \end{bmatrix}$$

$$\theta$$

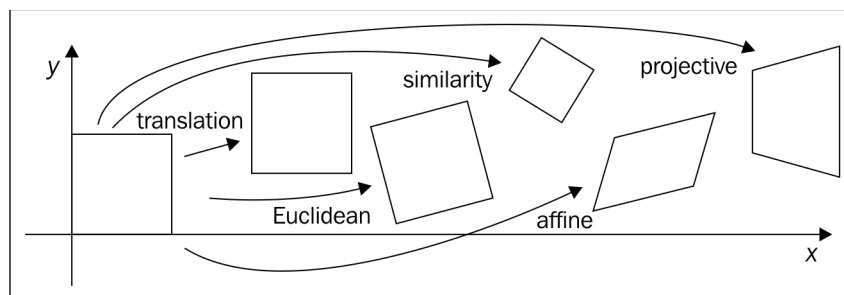
$$s$$

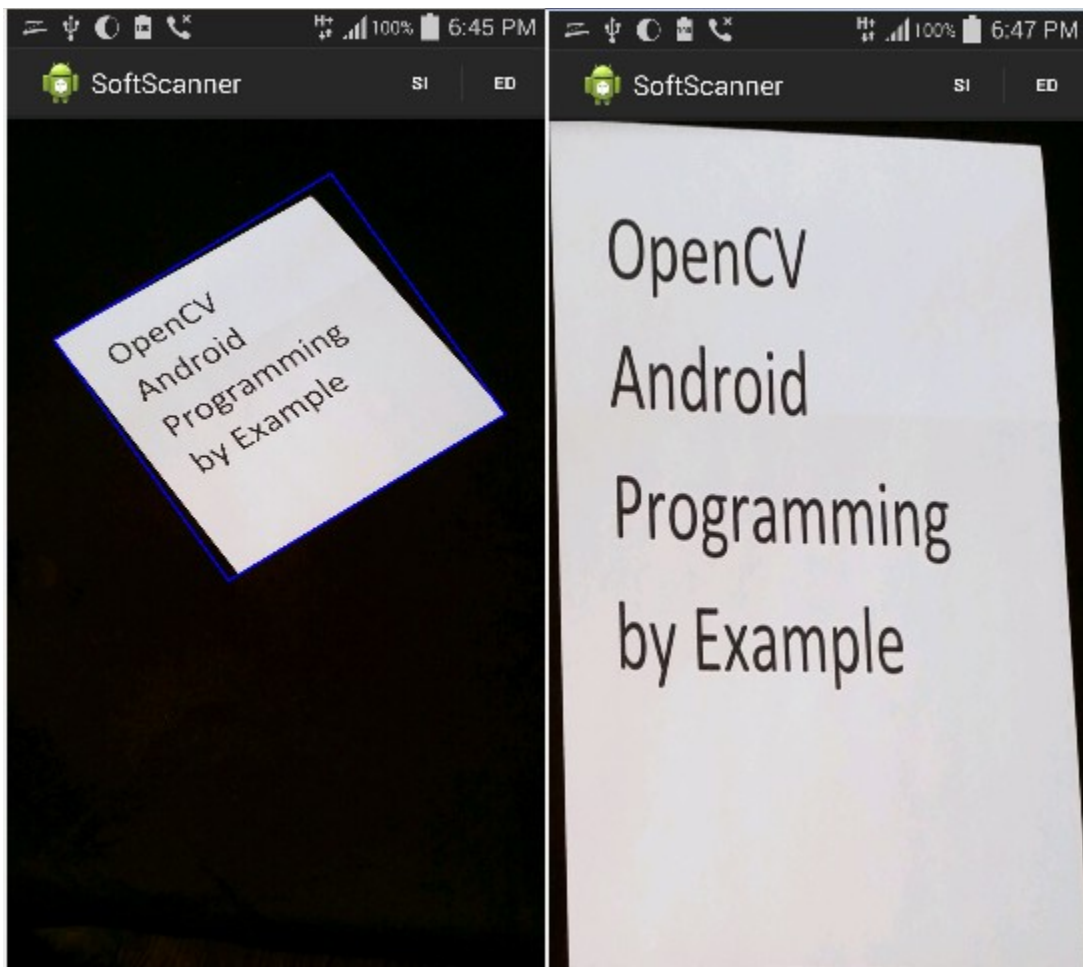
$$p' = sRp + t$$

$$p' = Ap\tilde{}$$

$$p\tilde{=} = [x, y, 1],$$

$$\begin{bmatrix} a & b & c \\ d & e & f \end{bmatrix}$$





L_1

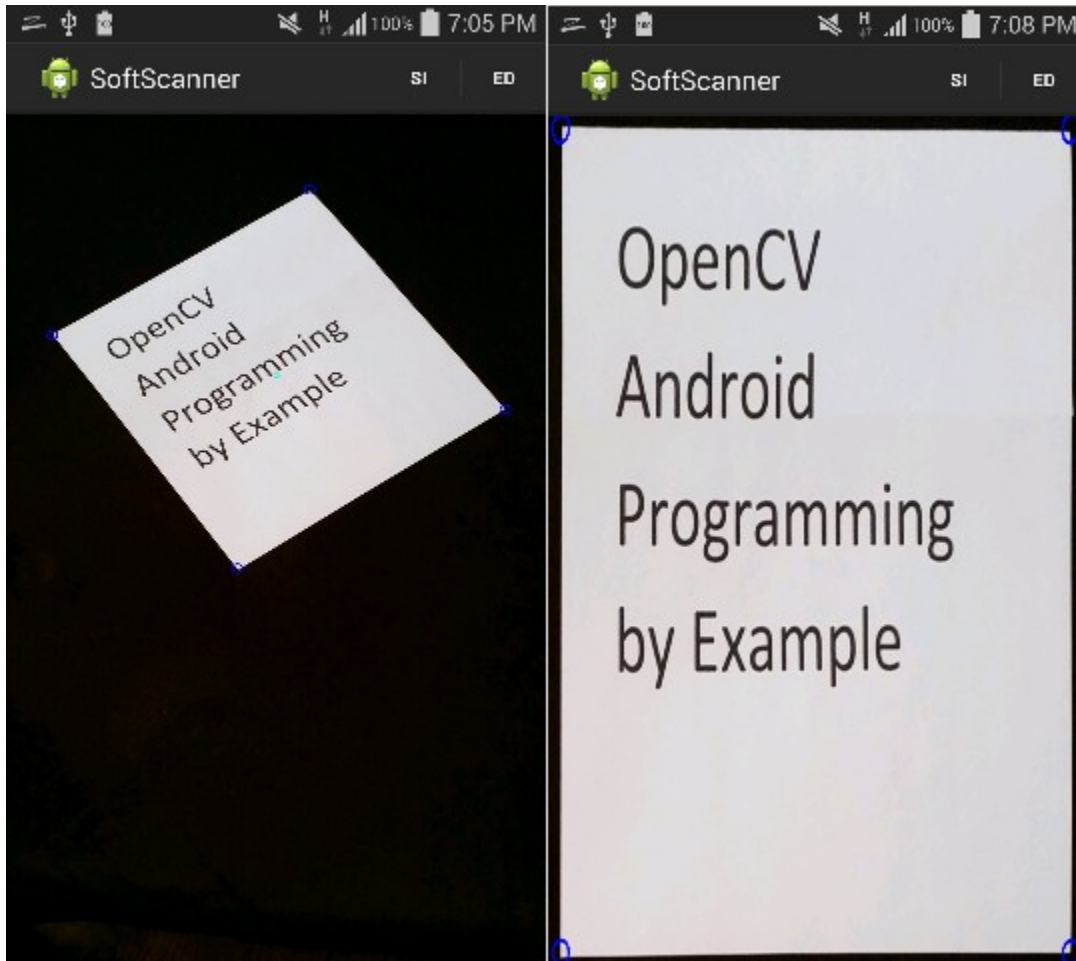
$(X_1, Y_1), (X_2, Y_2)$

L_2

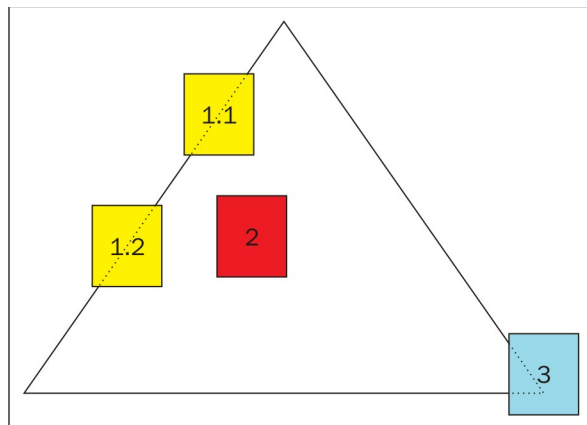
(X_3, Y_3) and (X_4, Y_4)

$$IP_x = \left(\frac{(x_1 y_2 - y_1 x_2)(x_2 - x_4) - (x_1 - x_2)(x_2 y_4 - y_2 x_4)}{(x_1 - x_2)(y_2 - y_4) - (y_1 - y_2)(x_2 - x_4)} \right)$$

$$IP_y = \left(\frac{(x_1 y_2 - y_1 x_2)(y_8 - y_4) - (y_1 - y_2)(x_8 y_4 - y_8 x_4)}{(x_1 - x_2)(y_8 - y_4) - (y_1 - y_2)(x_8 - x_4)} \right)$$



Chapter 5: App 3 - Panoramic Viewer



Convert to C or C++

C Project C++ Project

Project options

Specify project type


Project type:

- Executable
- Shared Library
- Static Library
- Makefile project

Toolchains:

- Other Toolchain --
- Android GCC
- Cross GCC
- Cygwin GCC

Show project types and toolchains only if they are supported on the platform



Builder Settings | Behaviour | Refresh Policy

Build settings

Stop on first build error

Enable parallel build

- Use optimal jobs (4)
- Use parallel jobs:
- Use unlimited jobs

Workbench Build Behavior

Workbench build type: Make build target:

Build on resource save (Auto build) Variables...

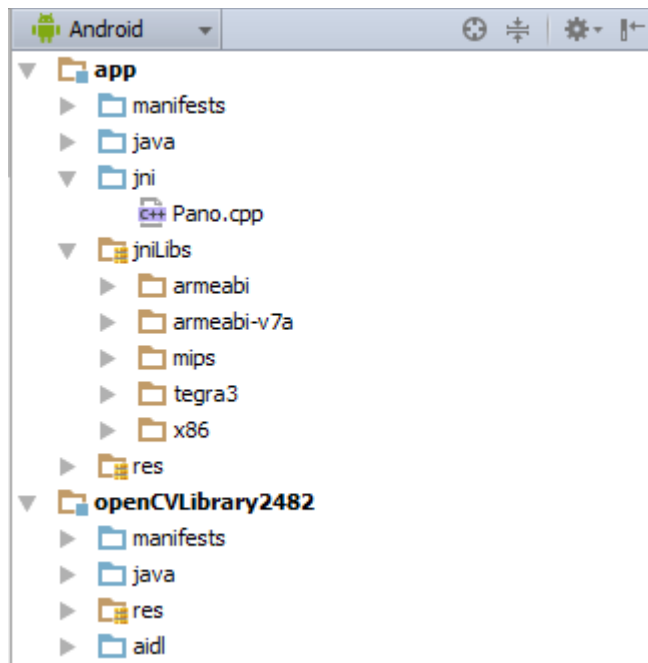
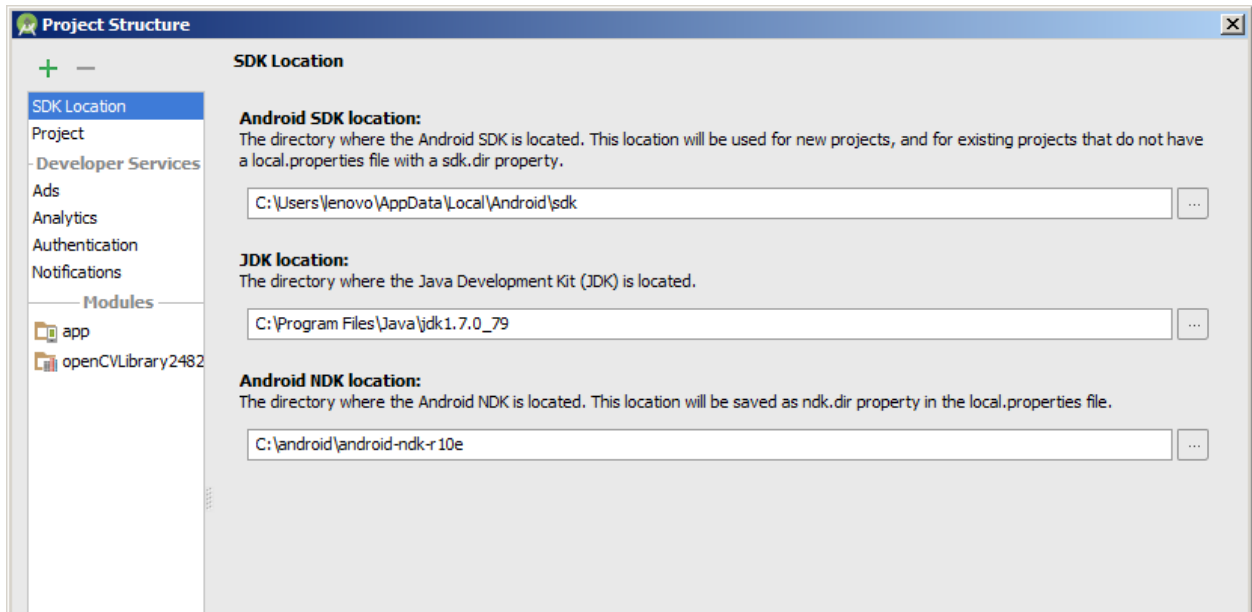
Note: See Workbench automatic build preference

Build (Incremental build) Variables...

Clean Variables...

Restore Defaults Apply

- Android Dependencies
- assets
- bin
- gen [Generated Java Files]
- jni
 - Pano.cpp
 - Android.mk
 - Application.mk

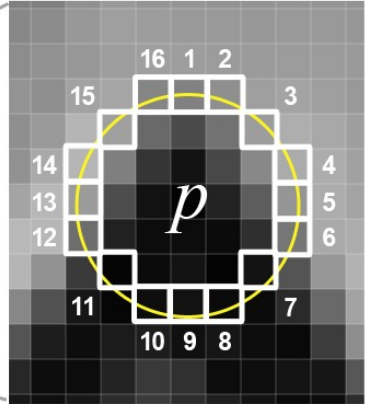


11:05 AM 8% 11:06 AM 8%

Pano

Pano





ψ H+ 9% 11:15 AM ψ H+ 10% 11:16 AM

ψ Pano ψ Pano



ψ H 17 10% 11:21 AM

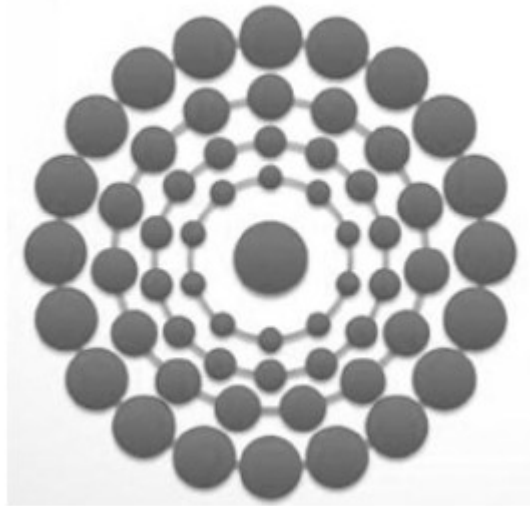
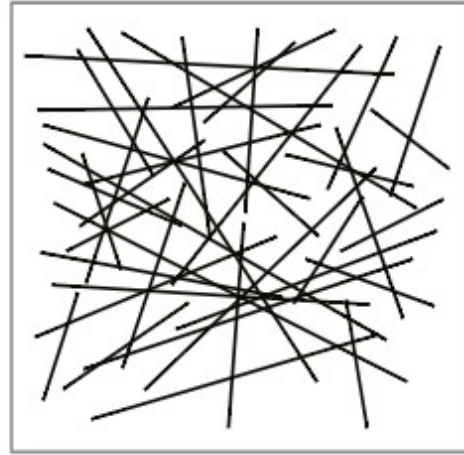
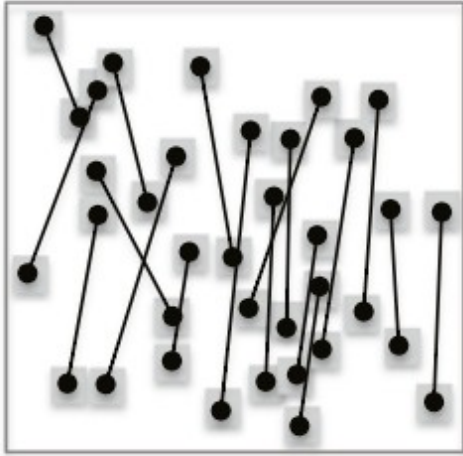
Pano

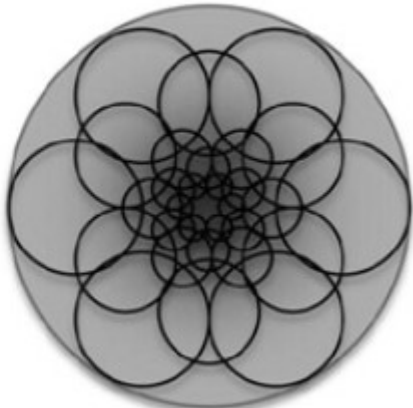
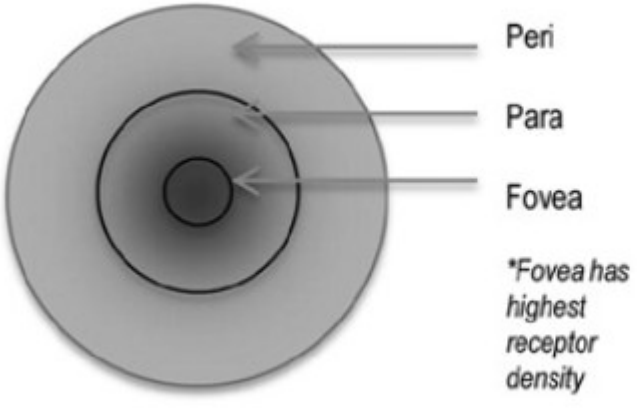


ψ H 17 10% 11:22 AM

Pano







11:37 AM 12% 4G

Pano

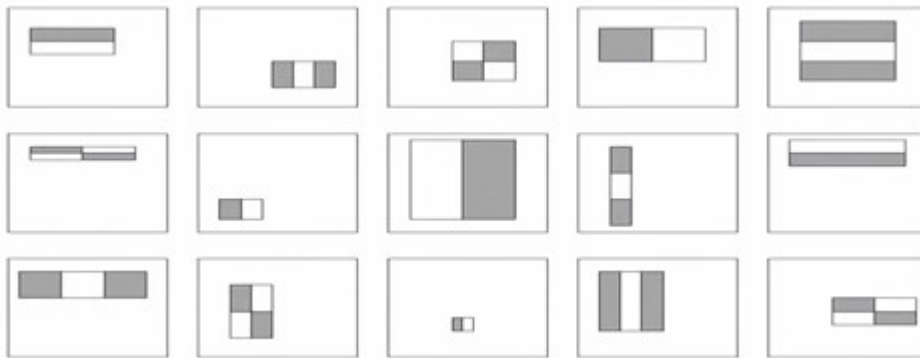
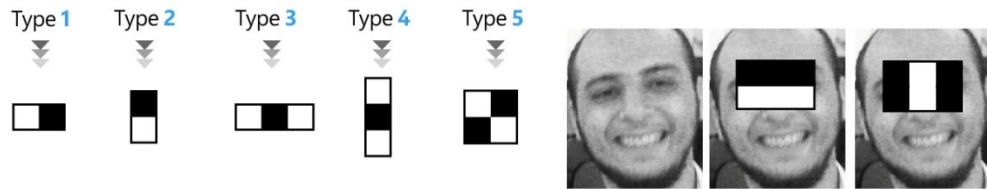


11:46 AM 13% H

Pano



Chapter 6: App 4 - Automatic Selfie



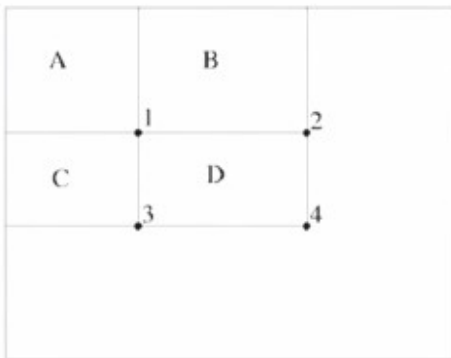
1	1	1
1	1	1
1	1	1

Input image

1	2	3
2	4	6
3	6	9

Sum
above
and
to left

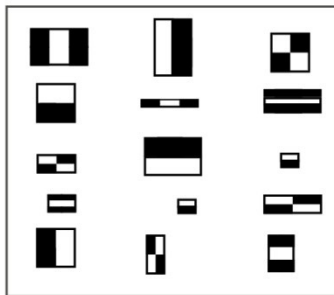
Integral image



Sum of all pixels in

$$\begin{aligned}
 D &= 1 + 4 - (2 + 3) \\
 &= A + (A + B + C + D) - (A + C + A + B) \\
 &= D
 \end{aligned}$$

All features



Relevant
feature



Irrelevant
feature

