

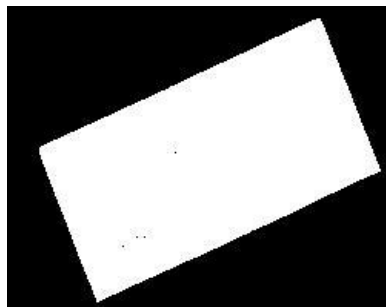
识别系统实例

- 钱币识别
 - 纸币-人民币识别
 - 硬币识别
- 指纹识别
- 掌纹识别
- 人脸识别





尺寸大小



人民币面值识别系统

图片显示



操作

预处理

打开

灰度处理

阈值化

识别方法

边长识别

颜色识别

边长识别结果显示

人民币坐标显示: (224, 99) (30, 81)
(59, 166) (195, 14)

实际人民币尺寸: (418*196)

实际钞票面积 83298.55

面额为50元整

颜色识别结果显示

面值比率:

颜色

人民币面值识别系统

图片显示



操作

预处理

打开

灰度处理

阈值化

识别方法

边长识别

颜色识别

边长识别结果显示

人民币坐标显示: (222, 78) (9, 150)
(204, 175) (30, 49)

实际人民币尺寸: 不能正确显示人民币尺寸

实际钞票面积 94477.85

面额为100元整

颜色识别结果显示

面值比率:

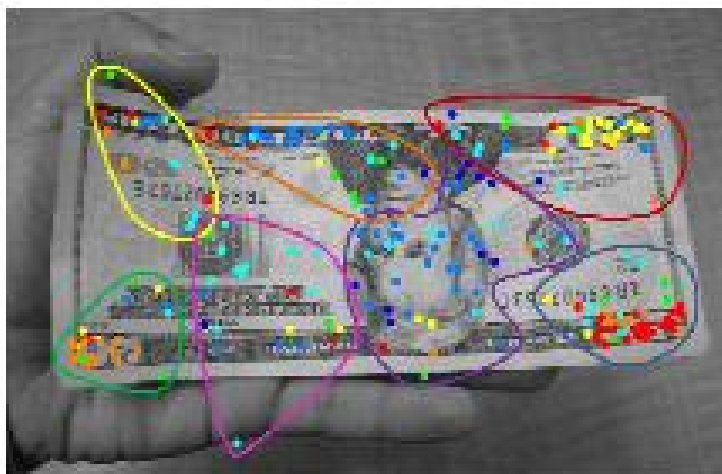
100元:60.4%	20元:31.5%	50元:0.6%
10元:2.0%	5元:0.3%	1元:0.1%

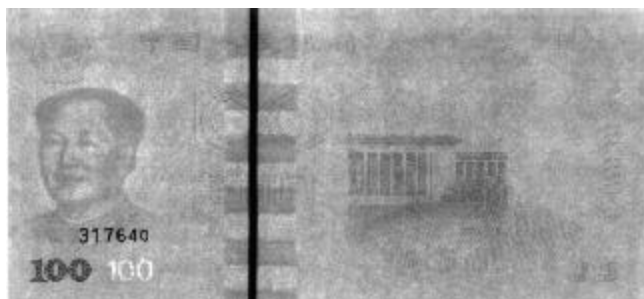
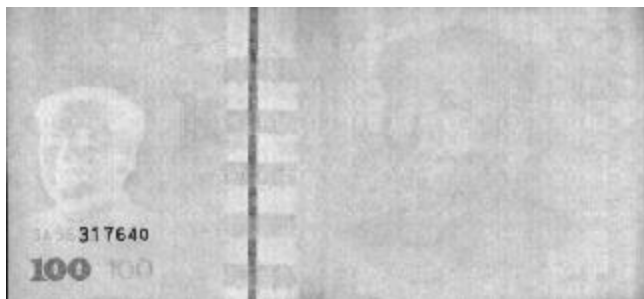
实验结果

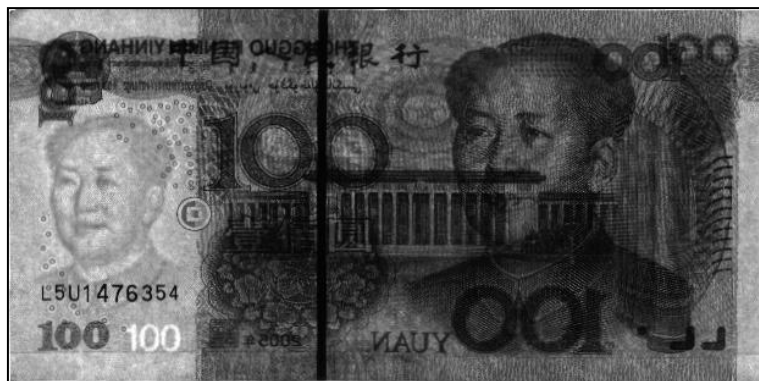
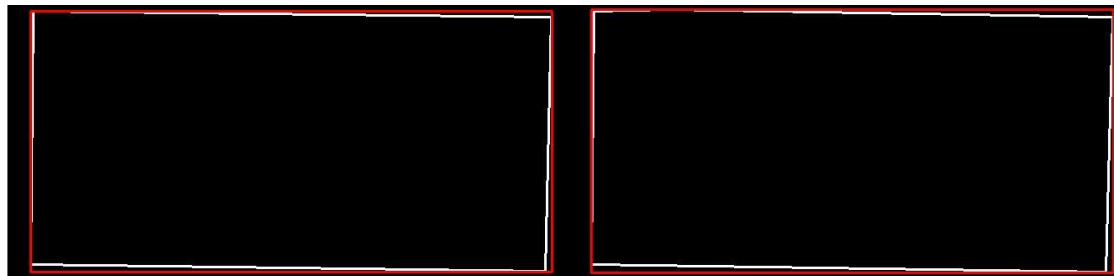
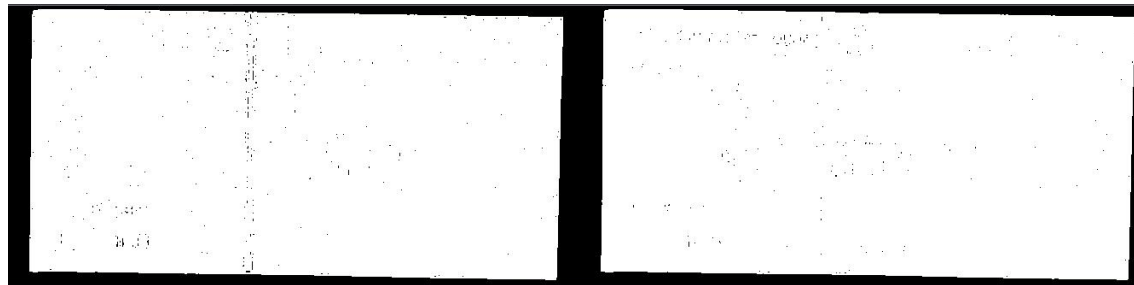
表 2 几何信息提取与颜色的面值识别率结果

钞票面额	总共图片	成功识别数目	失败数目	识别率
100	101	101	0	100%
50	94	94	0	100%
20	93	93	0	100%
10	90	90	0	100%
5	104	104	0	100%
1	91	91	0	100%
非人民币	4	4	0	100%
	573	573	0	100%









L5U1476354

L5U1476354

L5U1476354

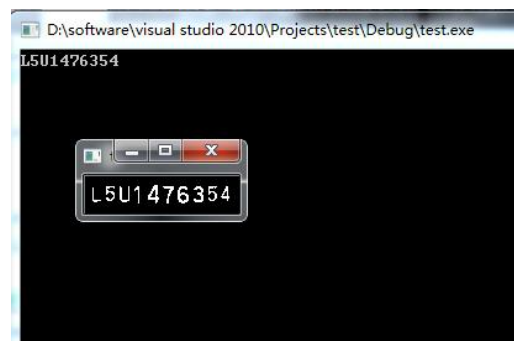
L5U1476354

L5U1476354

L5U1476354

L 5 U 1 4 7 6 3 5 4

L5U1476354



测试结果

表 5.2 实验结果

	待识别 张数	正确定 位序 列 号图 像 张数	正确分 割序 列 号图 像 张数	人民币识别性能		字符识别性能	
				准确 张数	准确率	准确 个数	准确率
近红外采集 人民币图像 (如图 1.1)	91	91	91	89	97.80%	908	99.78%
扫描仪采集 人民币图像 (如图 1.2)	81	81	81	78	96.20%	806	99.51%



Coin Segmentation



0102.01R0 L_00 333.0°
18.0 1.58

seibersdorf research



Feature Extraction



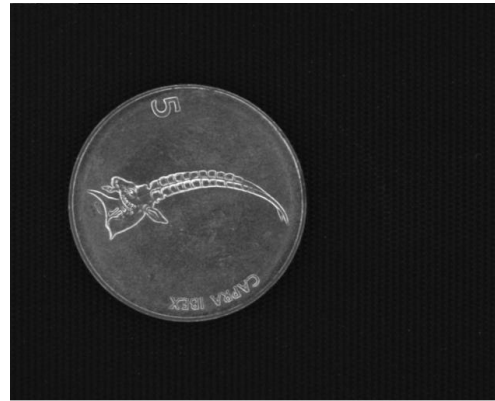
Evaluation

- 109 coin types
- 389 coin classes
- Training set
 - 4575 coins
 - 8762 images
- Test set
 - 1100 coins
 - 2200 images



0606.01F0 L_16
20.9 1.62

seibersdorf research



2806.01F0 L_04
25.7 1.71

seibersdorf research



0102.01F0 L_00 333.0°
18.0 1.58





seibersdorf research



0105.01F0 L_01
19.0 1.52

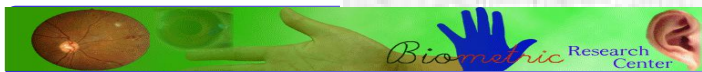
seibersdorf research

Results

	es]] m [6]		o)
Wavelet feature [6]		46.0	
	Nc Eu Nc + Chi		

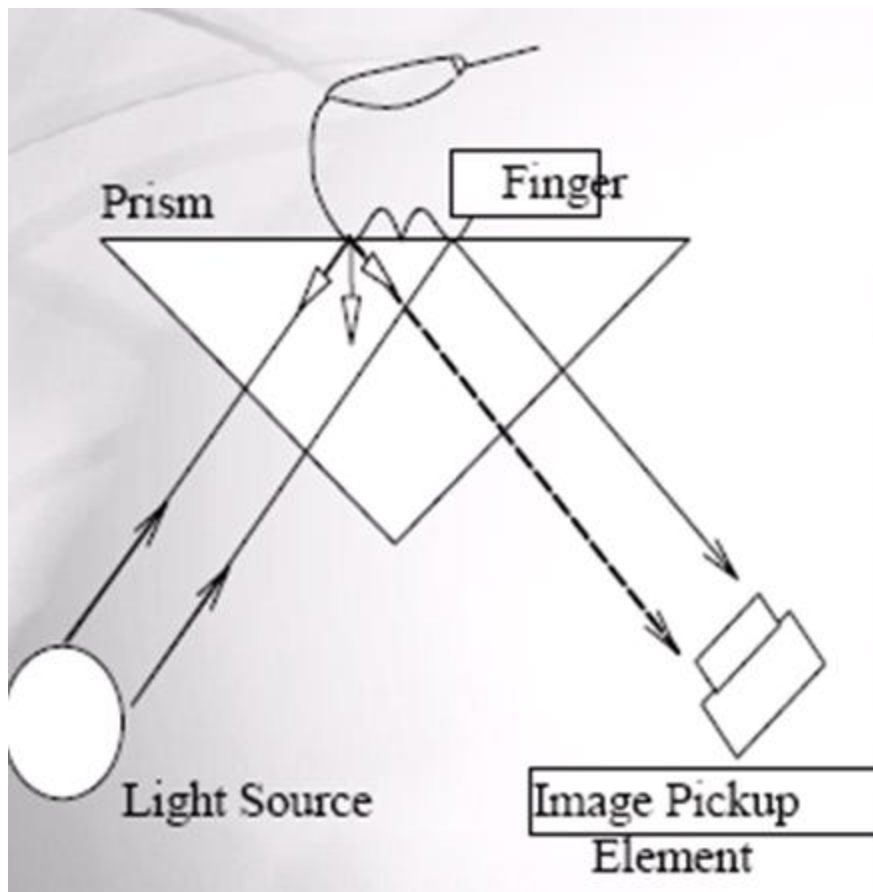
指纹识别

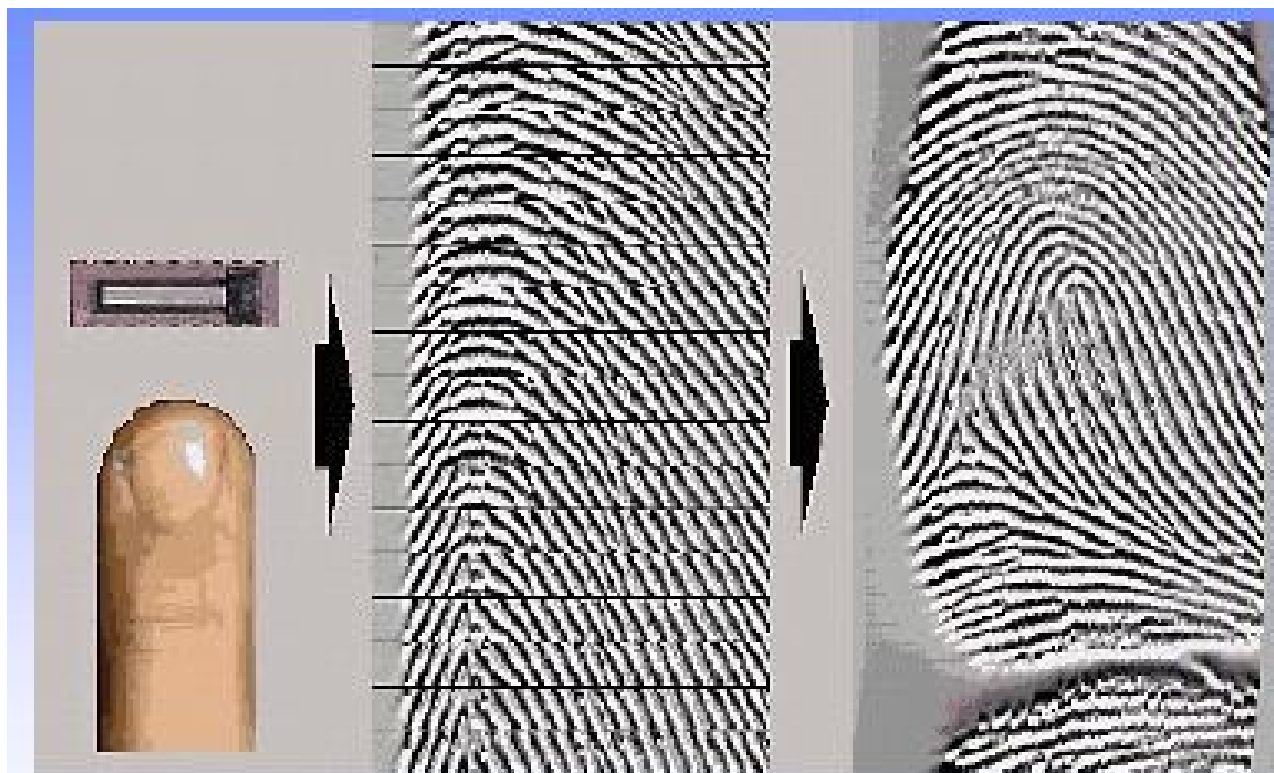
APPLICANT Leave Blank		Teacher, Theresa C.		Leave Blank	
308 School Street Hammonton, NY 12110		Formerly: Theresa Smith		NY1210402 NYST ED Dept 1040 ALBANY, NY	
5/90/90		US		11/24/90	
Smart Falls Central School Dist Smart Falls, NY 12110		Leave Blank		Leave Blank	
Leave Blank		Leave Blank		Leave Blank	

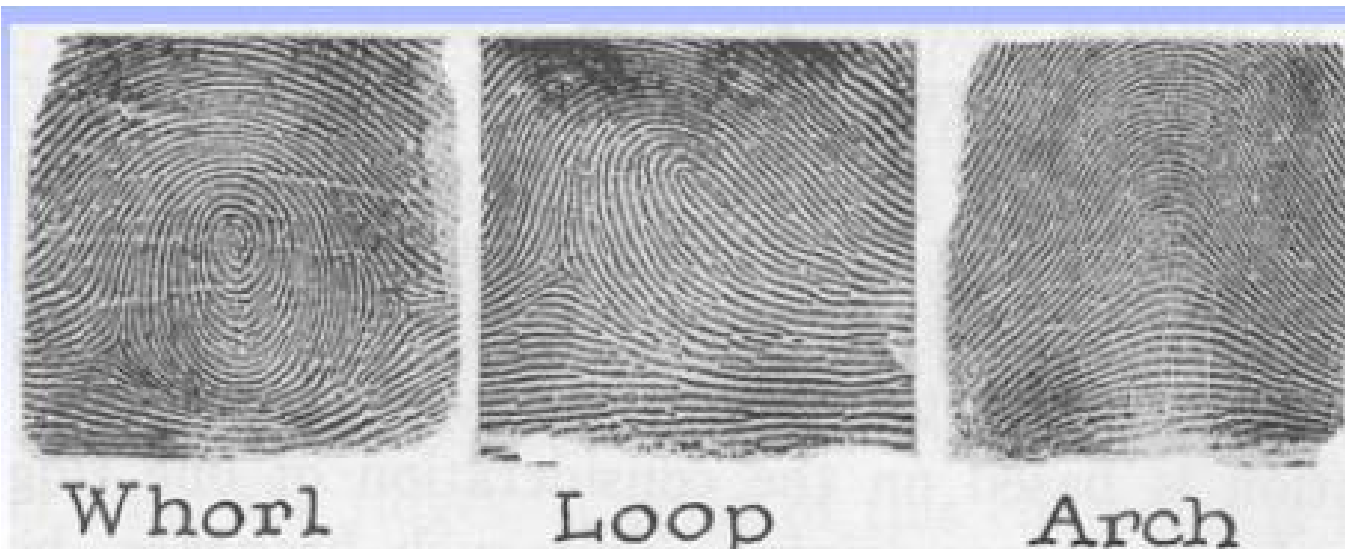


深圳大学—德州仪器DSP实验室



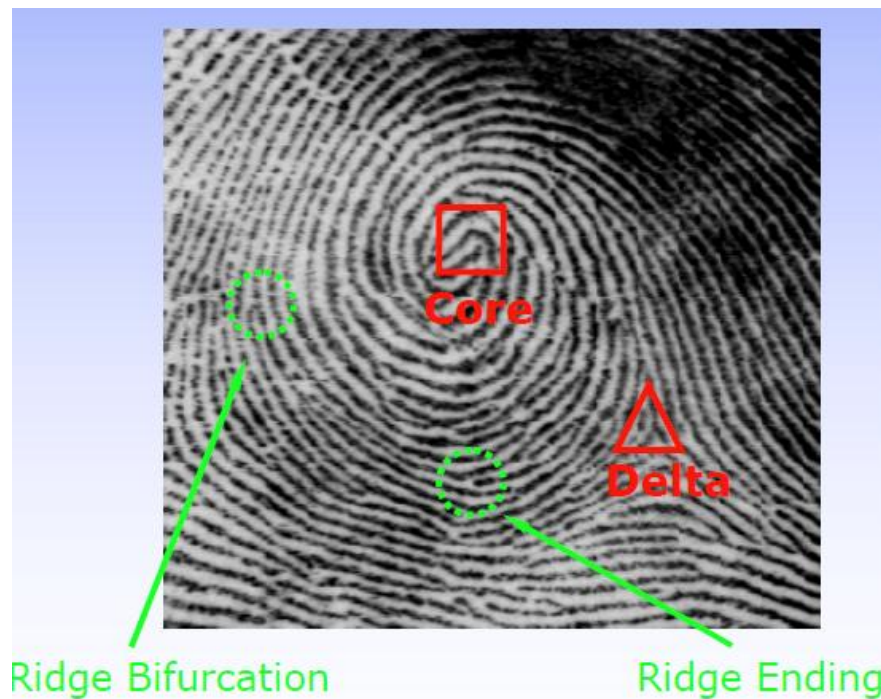
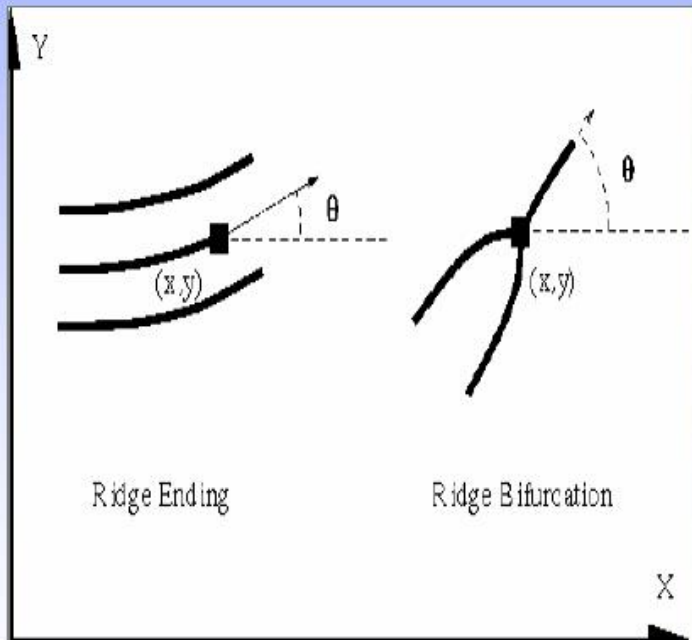


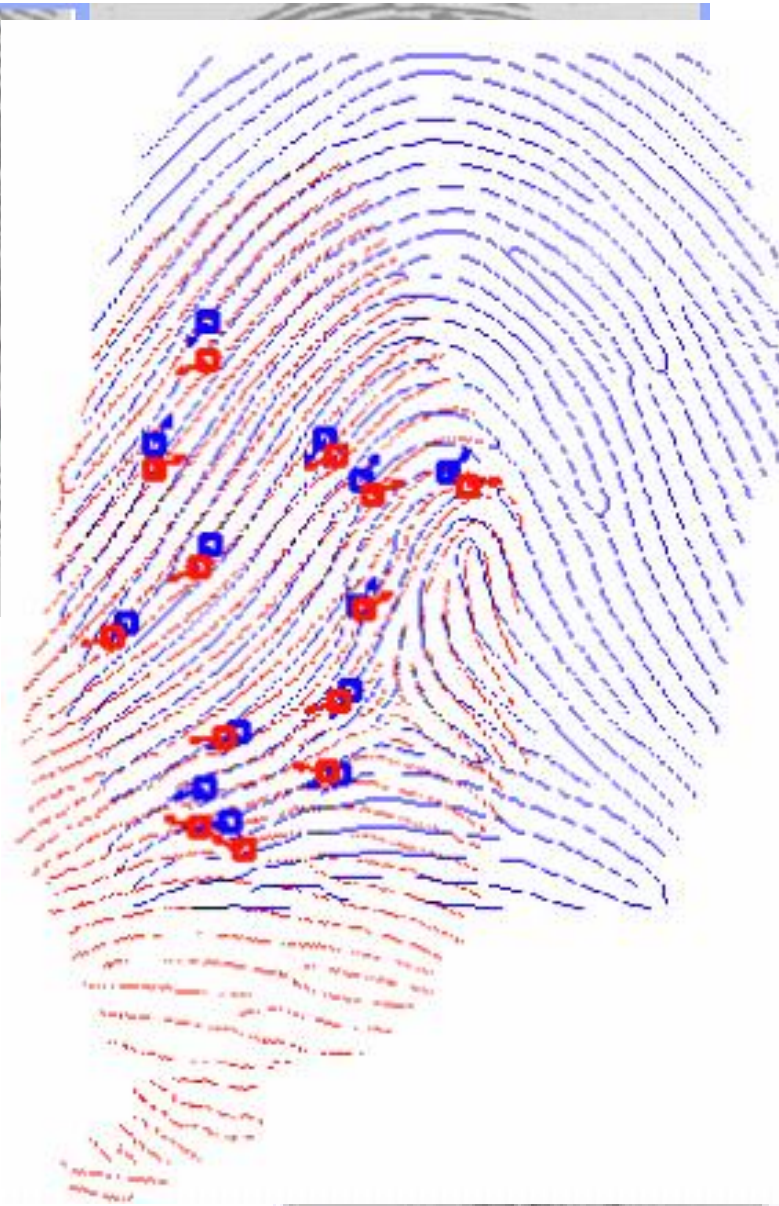
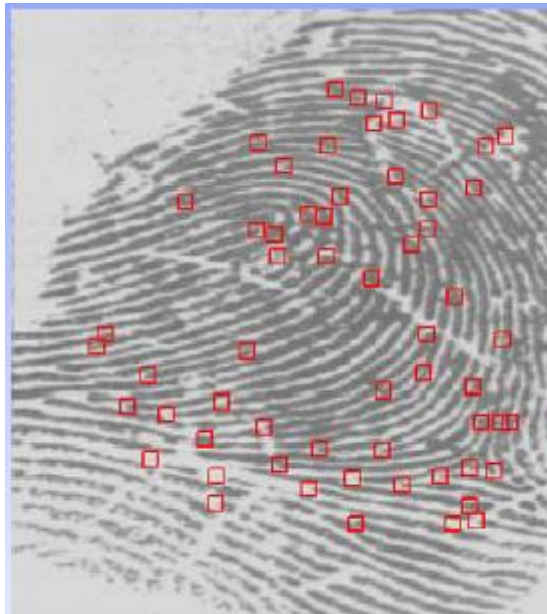


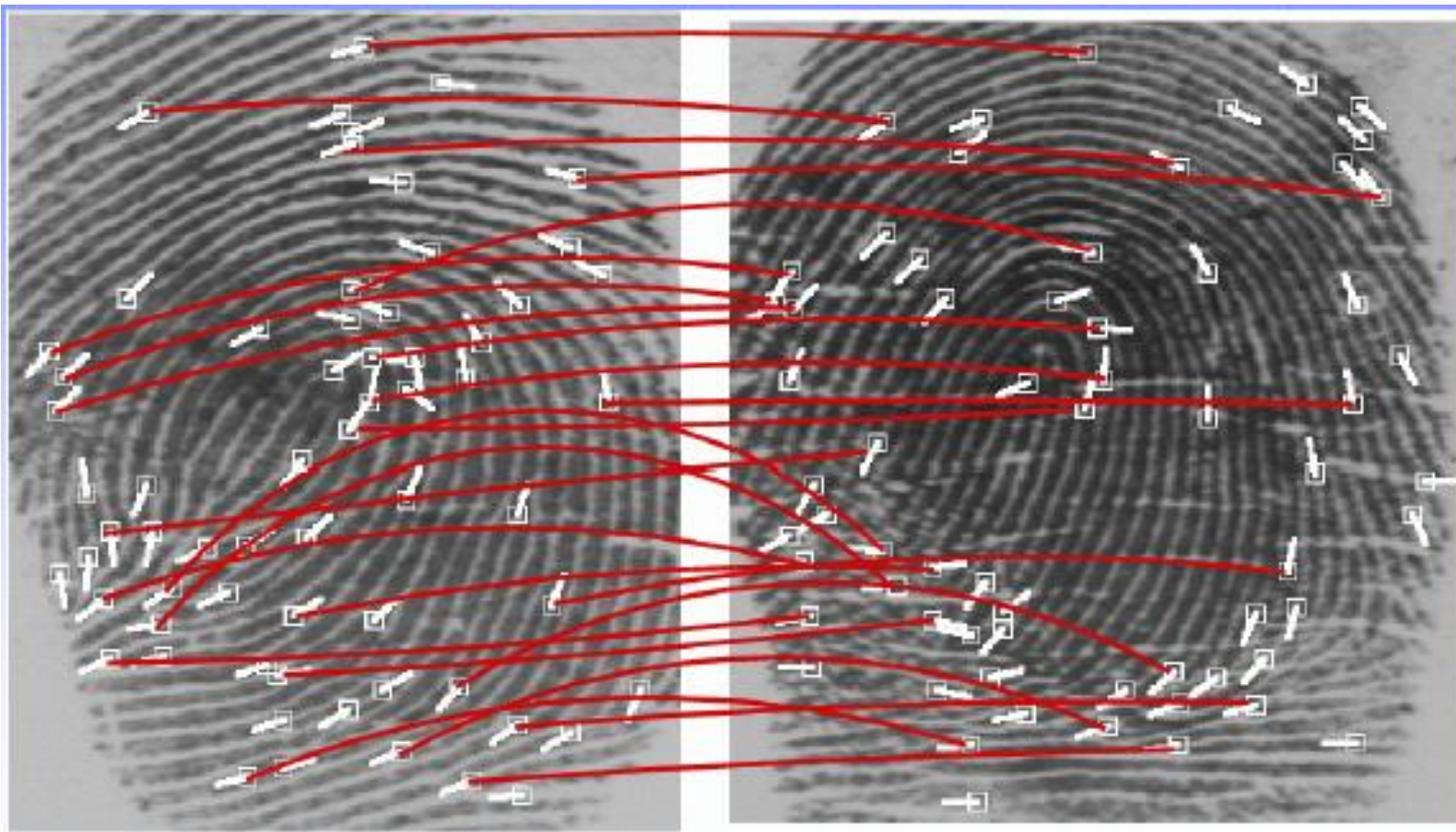


"Only Once during the Existence of Our Solar System Will two Human Beings Be Born with Similar Finger Markings". *Harper's headline, 1910*

"Two Like Fingerprints Would be Found Only Once Every 10^{48} Years". *Scientific American, 1911*







Disney World, Orlando



Throughput: 100K/day



US-VISIT



~ 60 million visitors have been processed through US-VISIT; 1,100 criminals denied entry

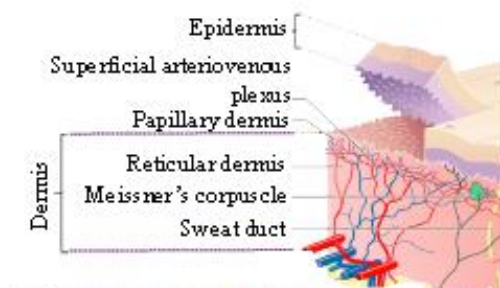


深圳大学—德州仪器DSP实验室

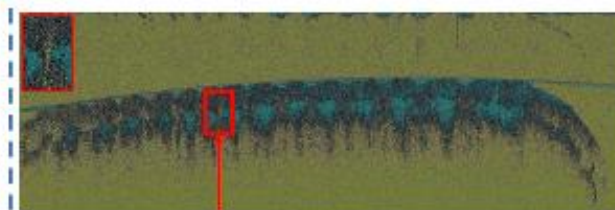


好好睡，我找人替您打卡去

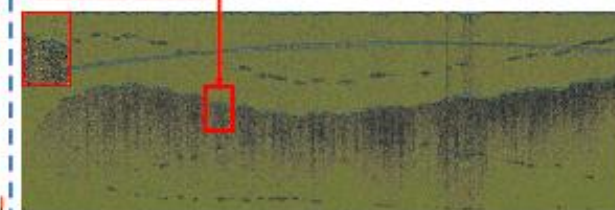




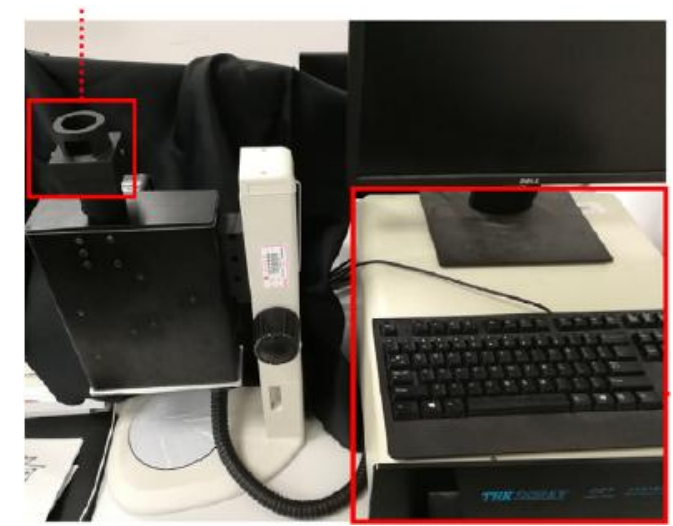
B-scan



Different feature Bona fide B-scan



PA(Transparent Silica Gel) B-scan



(c)

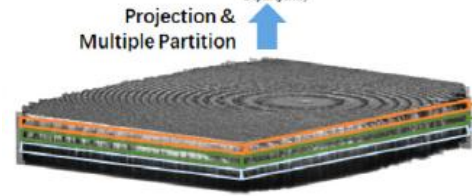
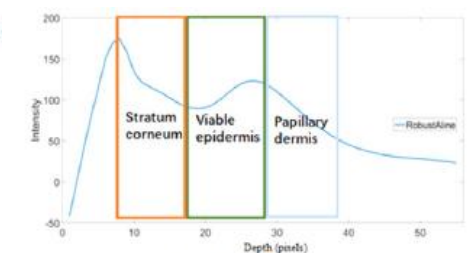
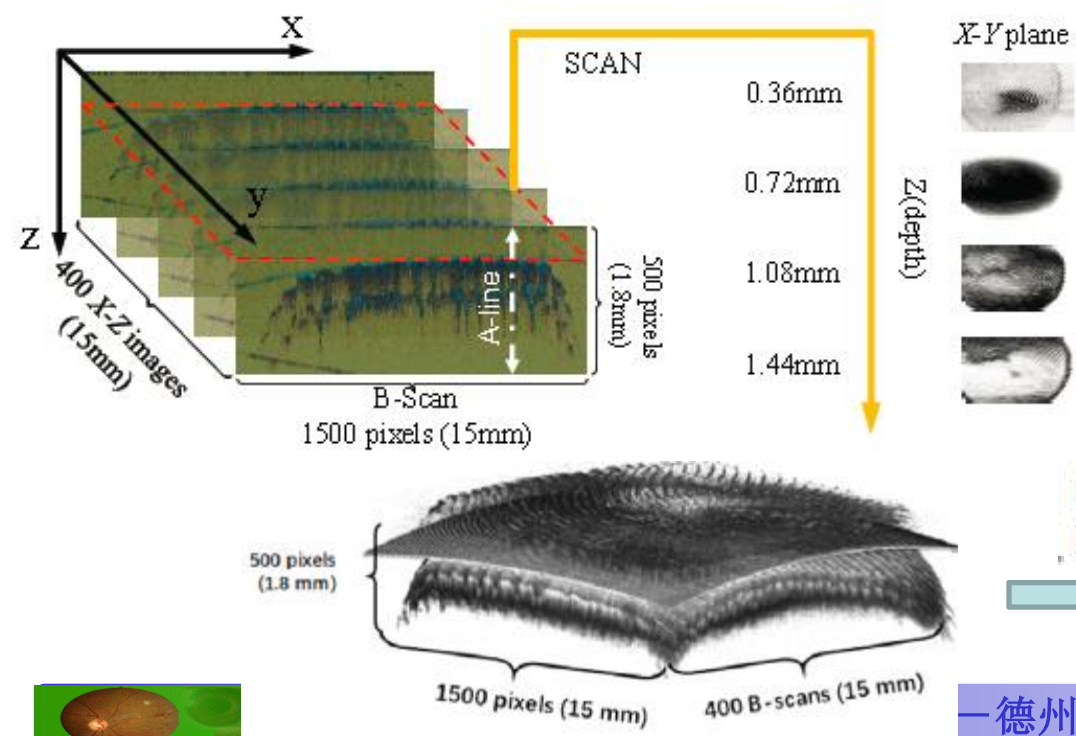
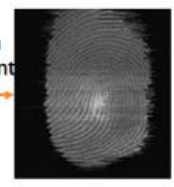
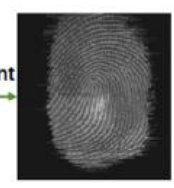


Image Processing

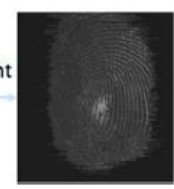
Corneum fingerprint



Internal fingerprint



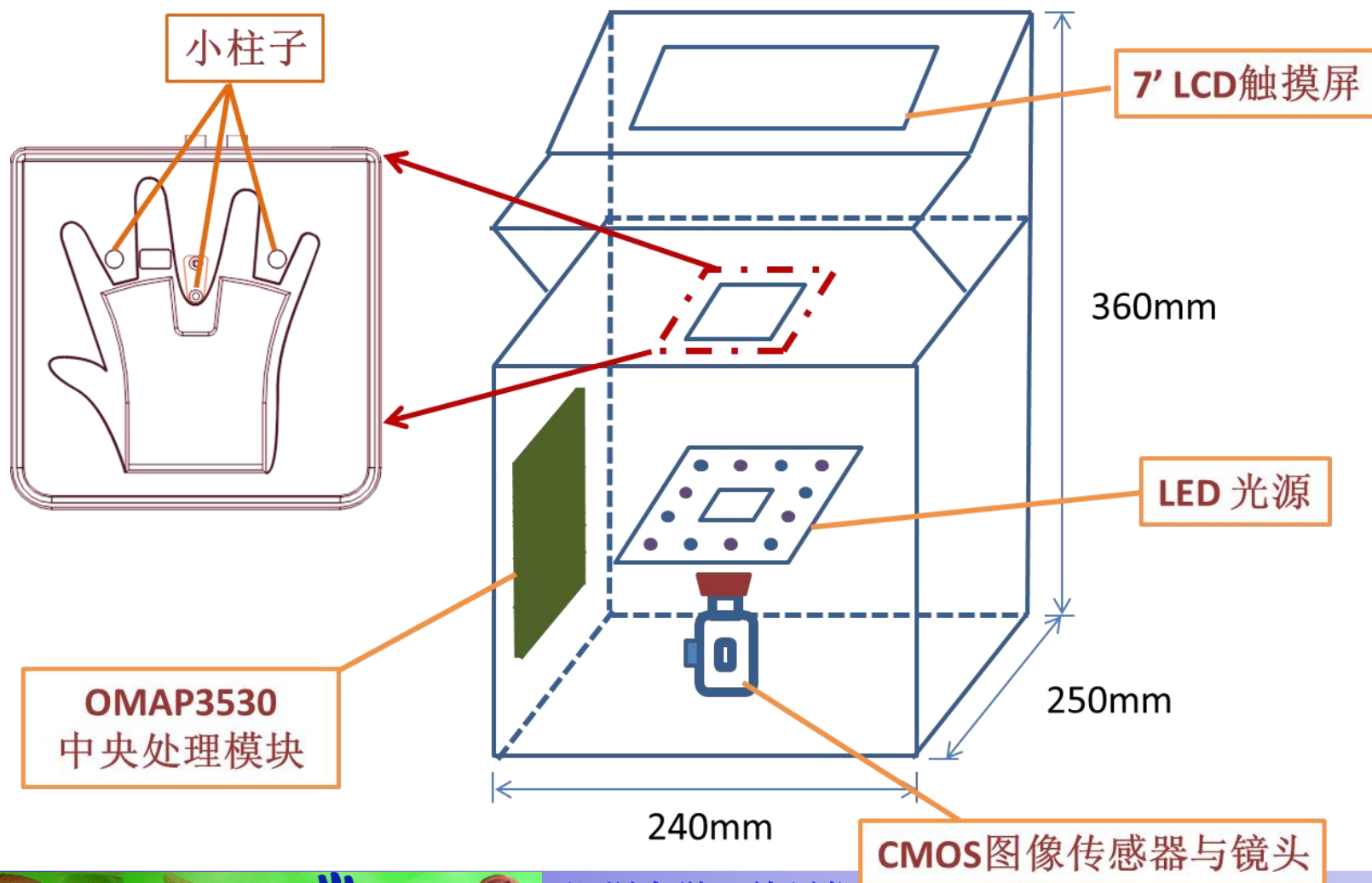
Papillary fingerprint



掌纹识别



采集系统设计



Preprocessing

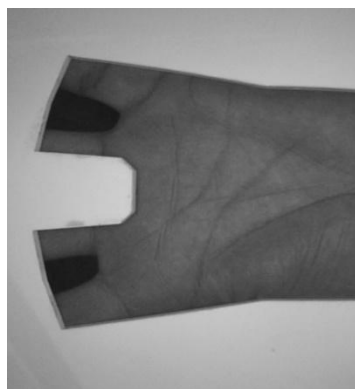
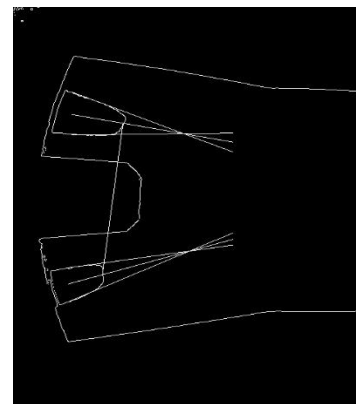
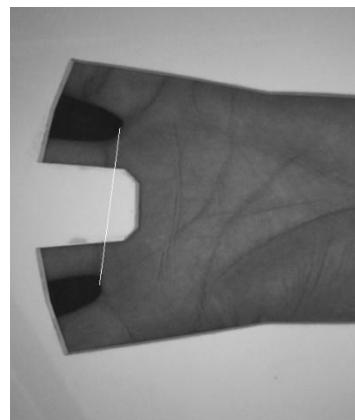
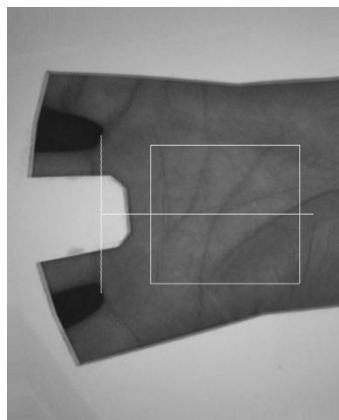
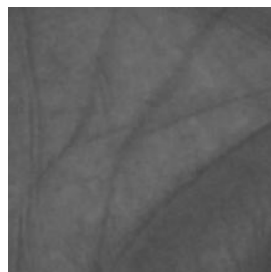
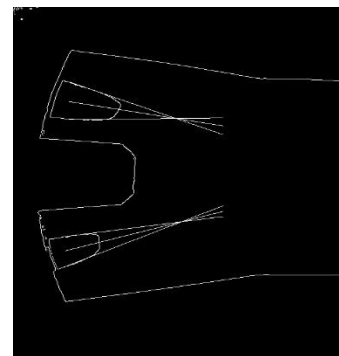
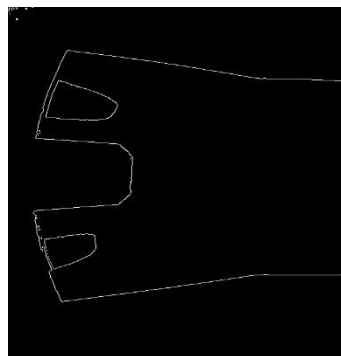
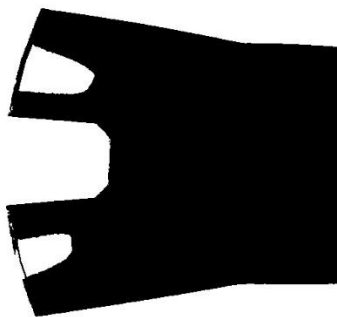
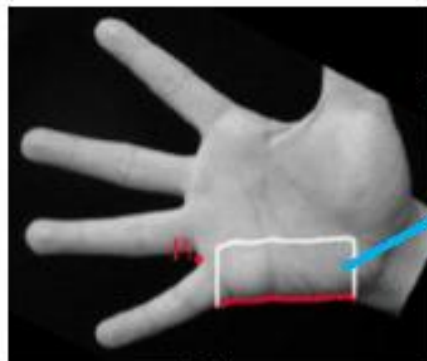


Figure 1

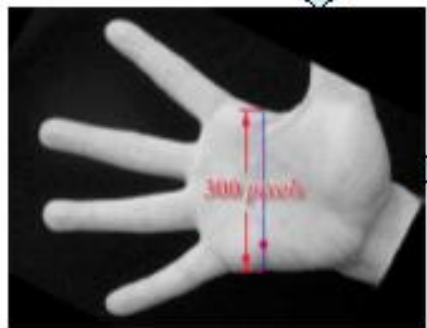




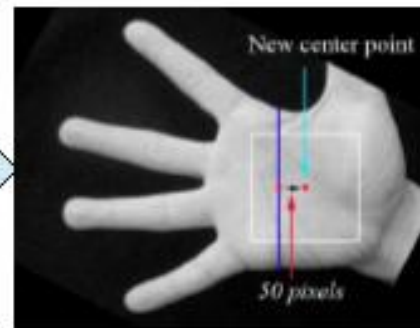
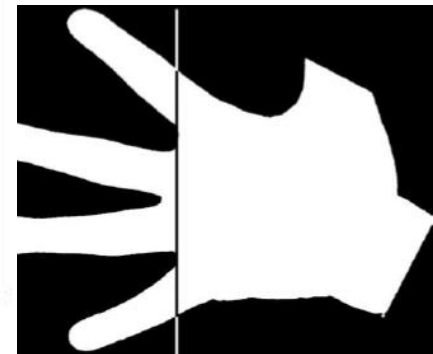
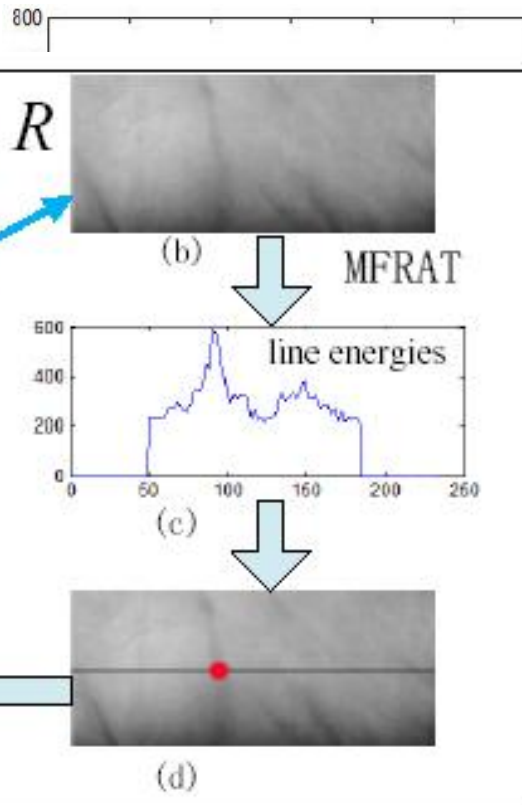
(a)



(e)



(f)



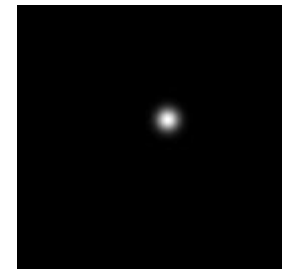
New center point

50 pixels

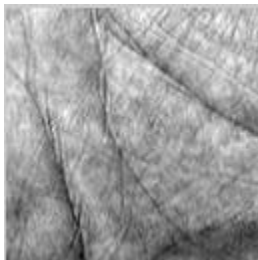


Feature Extraction

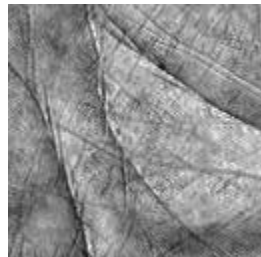
- Parameters
 - Orientation $\pi/4$
 - Frequency 0.0916 cycles/pixel
 - Width of Gaussian 5.6179



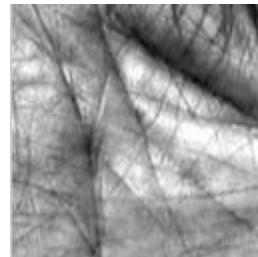
Subject 1



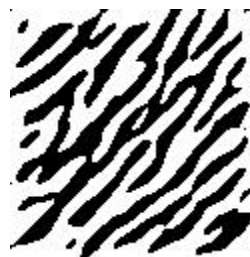
Subject 1



Subject 2



Palmprint Images



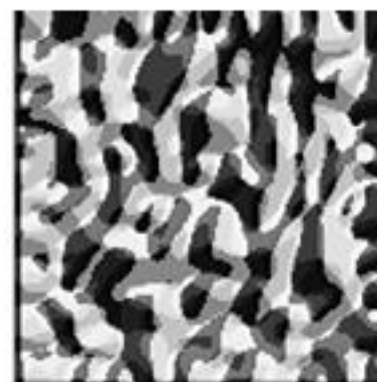
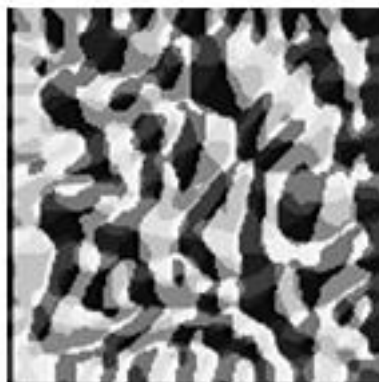
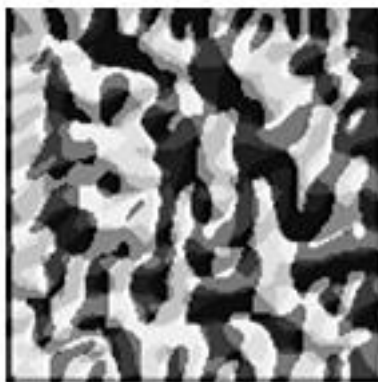
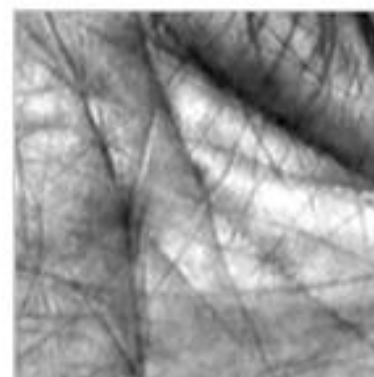
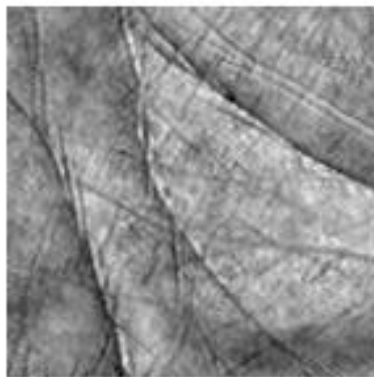
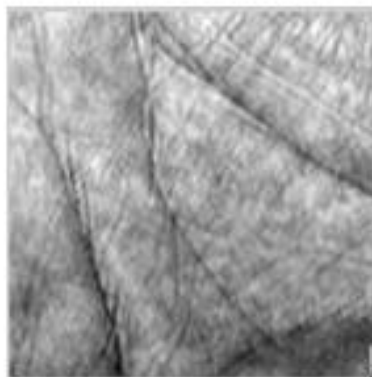
Real Code



Imaginary Code

Distance: 0.2451

Distance: 0.4603



Distance: 0.3036

Distance: 0.4422

Evaluation

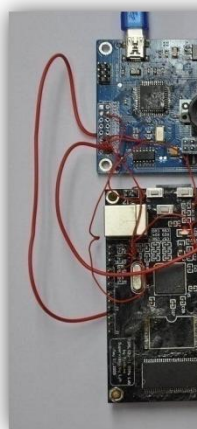
- Database
 - PolyU palmprint database
 - 386 palms from 193 persons
 - 2 sessions, 10 samples per session
- Settings
 - 3 samples in the 1st session as registered templates
 - 1158 templates
 - 10 samples in the 2nd session as testing
 - 3849 testing images

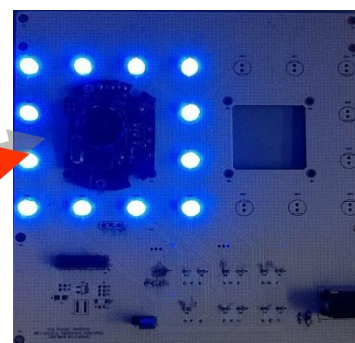
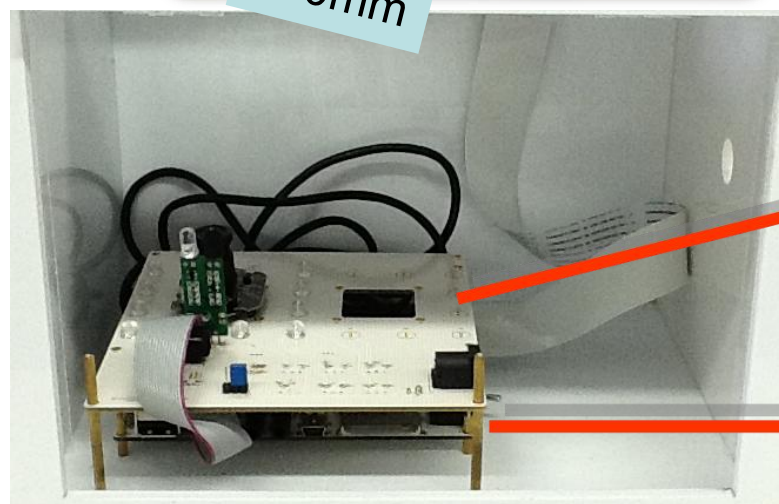
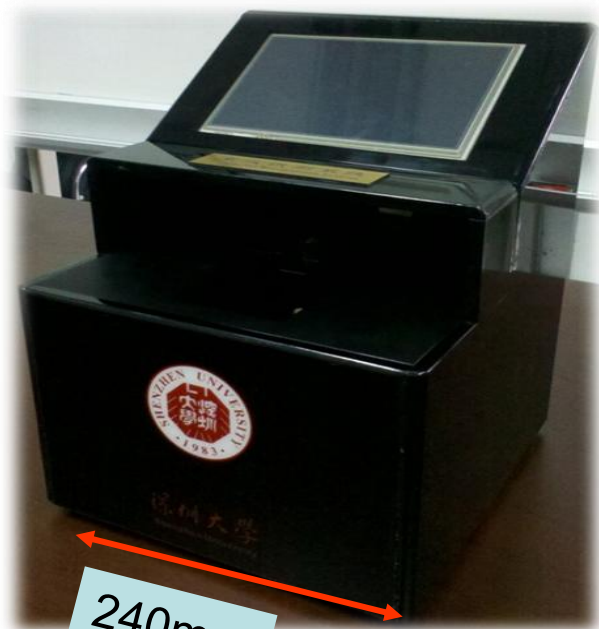
Results

Methods	Identification Rate	Feature Extraction	Matching
PalmCode	88.43%	51.8 ms	4.3 ms
FusionCode	90.94%	120 ms	4.3ms
G-LBPCode	96.82%	125 ms	77.7 ms

- *Dell* PC (Intel P4 3GHz, 1G RAM)

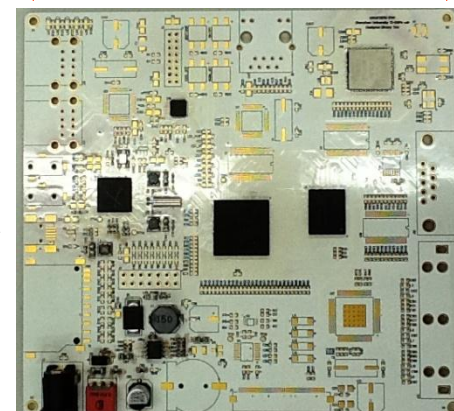
嵌入式掌纹识别系统





118mm

122mm





Palmprint Recognition System



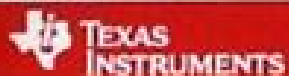
注册

识别

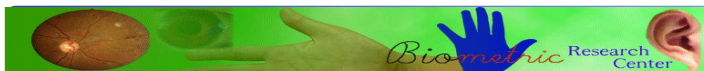
图像切换



手掌摆放示意



Shenzhen University - Texas Instruments DSP Technology Center



深圳大学—德州仪器DSP实验室





