FaceDemo

Performance Report

2017-10-11

OPEN AI LAB

Revision Record

Date	Rev	Change Description	Author
2017-10-24	0.1.0	Initial version	

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1 Purpose

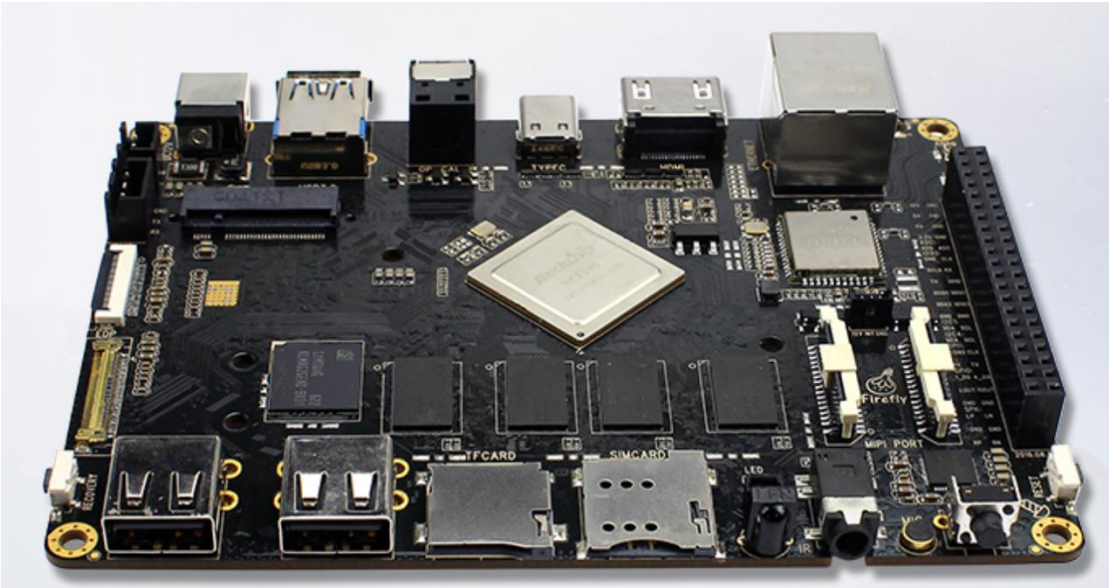
This Report is tested on RK3399 platform and the CaffeOnACL version is 0.4.0 with Arm Compute Library 17.10. The report only includes CPU data.

2 Test Environment

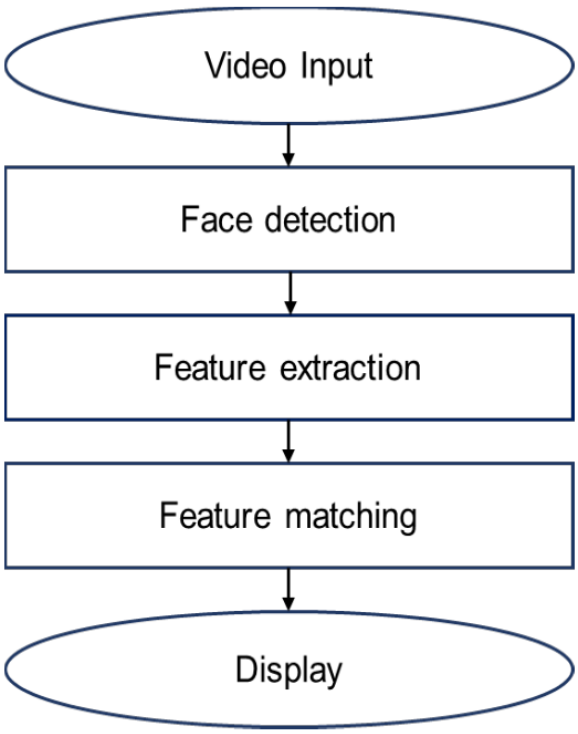
Hardware SoC : Rockchip RK3399

- GPU: Mali T864 (800MHz)
- CPU: Dual-core Cortex-A72 up to 2.0GHz (real frequency is 1.8GHz); Quad-core Cortex-A53 up to 1.5GHz (real frequency is 1.4GHz)

Operating System : Ubuntu 16.04



3 Face Recognition Flow



Face detection : Detect the face from input frame
Feature extraction : Extrace features from detected face
Feature matching : search the Database according the extracted feature, find the matching face

4 Performance

Face recognition performance is influenced by many factors, only faces, cores, minimum size of face are test. Note: the alignment is included in extraction. The results are as fellow.

4.1 Single A53 CPU @1.42GHz

Table 1. Performance of different part on Single A53

Test Case	Detection (ms/frame)	Extraction (ms/frame)	Verification (ms/frame)	Total (ms/frame)
480P 32*32 single face	785	1265	0.003	2050

480P 48*48 single face	321	1282	0.003	1603
480P 64*64 single face	252	1205	0.003	1457
480P 32*32 two faces	795	2444	0.006	3239
480P 48*48 two faces	325	2642	0.006	2967
480P 64*64 two faces	223	2582	0.005	2805

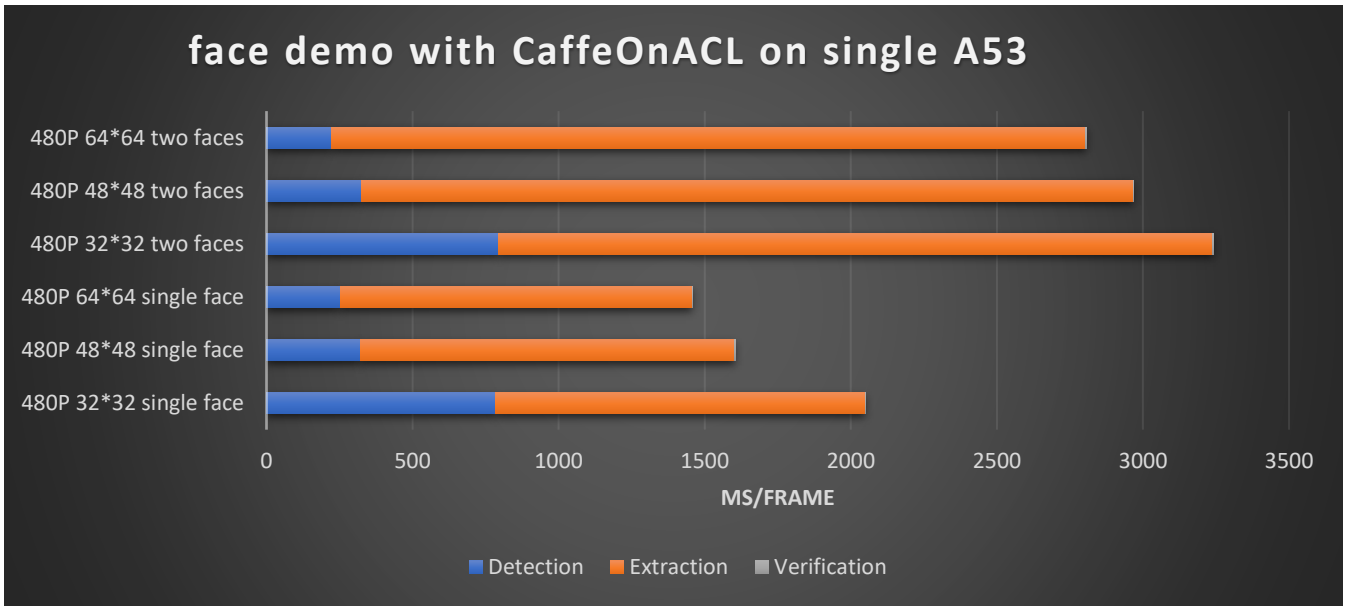


Fig 1. Performance Compare on Single A53

4.2 Single A72 CPU @1.8GHz

Table 2. Performance of different part on Single A72

Test Case	Detection (ms/frame)	Extraction (ms/frame)	Verification (ms/frame)	Total (ms/frame)
480P 32*32 single face	550	761	0.002	1311
480P 48*48 single face	157	805	0.002	962

480P 64*64 single face	105	806	0.002	911
480P 32*32 two faces	556	1423	0.003	1973
480P 48*48 two faces	174	1600	0.003	1774
480P 64*64 two faces	120	1623	0.003	1743

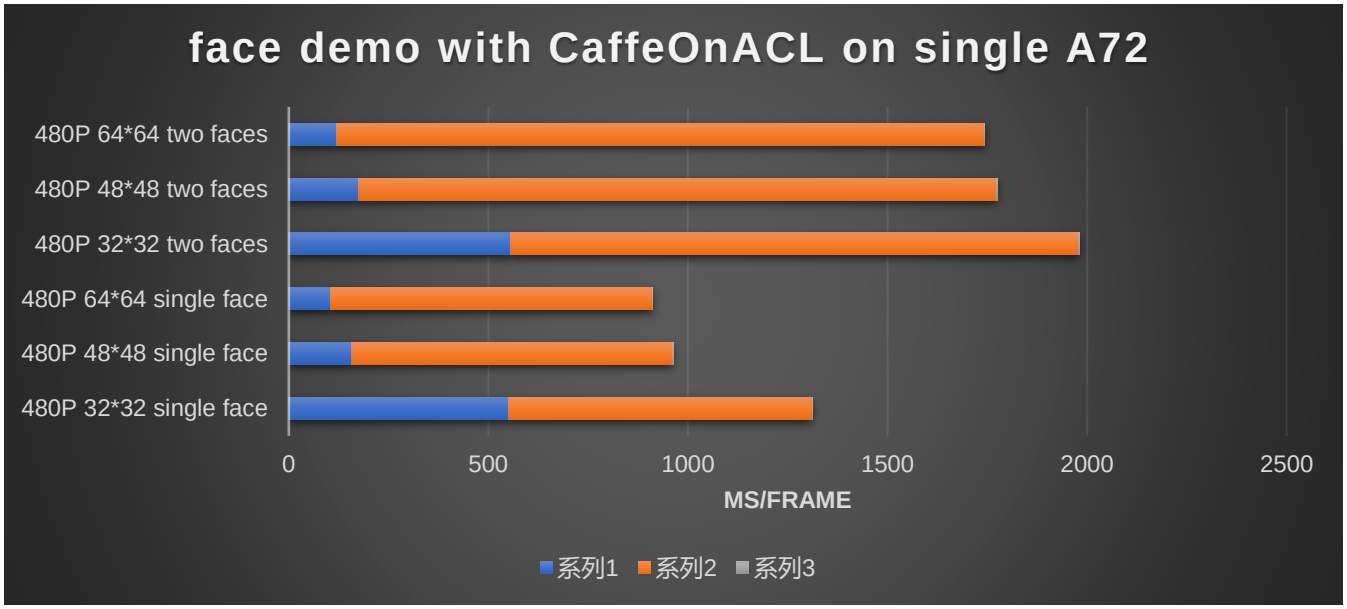


Fig 2. Performance Compare on Single A72

4.3 Multi CPUs(4xA53@1.42GHz+2xA72@1.8GHz)

Table 3. Performance of different part on Multi CPUs

Test Case	Detection (ms/frame)	Extraction (ms/frame)	Verification (ms/frame)	Total (ms/frame)
480P 32*32 single face	381	464	0.002	845
480P 48*48 single face	225	442	0.002	667
480P 64*64 single face	122	448	0.002	570

480P 32*32 two faces	410	786	0.004	1196
480P 48*48 two faces	295	907	0.005	1202
480P 64*64 two faces	162	850	0.004	1012

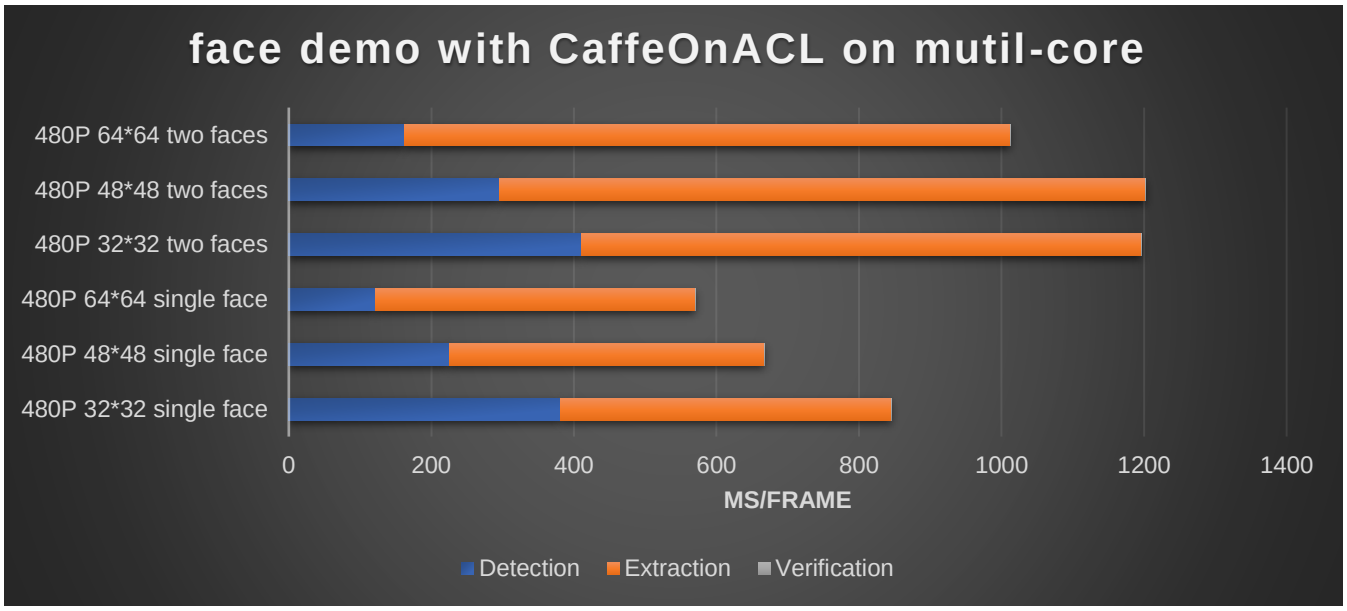


Fig 3. Performance Compare on Multi CPUs

5 Conclusion

From the above test cases, we can deduce that:

- Detection time is influenced by minimum face size, detection speed of 64x64 min face size is 3~5 time faster than 32x32 min face size's; but the number of faces has little influence;
- The feature extraction time increases with the number of faces;
- The performance on A72 is better than on A53 but worse than on Multi CPUs.