

BananaMark THEFINAL FRONTIER

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BACKGROUND

- Project Description
 - Native Development
 - Power
 - Novel Techniques
- Goals
 - We benchmark the Android

Testing Platforms

- Emulators and Physical Devices





RESEARCH

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AnTuTu Benchmark		AnTuTu Benchmark v2.0.1				
Samsung Galaxy S II			Ť	Ţ	i	
		Scores	Test	Ranking	Information	
My device : 5727		RAM:			912	
co opumus zx		CPU intege	er:		1407	
Moto xoom		CPU float-p	CPU float-point:		1248	
Nexus 5		2D graphics:		295		
HTC Desire HD		3D graphic	3D graphics:		1235	
Nexus One		Database IO:		340		
Moto Defy		SD card wr	SD card write:		(9.6 MB/s) 96	
		SD card read:		(>30 MB/s) 194		
		Total score:		5727		
500 1500 2500 3500 4500 5500		CPU freque	CPU frequency:		1200 MHz	
0 1000 2000 300	00 4000 5000 6	Date:		2011-06-29 17:50		
CPUI						

Antutu

CPU

Free memory:1490248 bytes

reating

long-lived binary tree of depth 14 long-lived array of 125000 doubles *Total memory:7938016 bytes *Free memory:3060144 bytes

Create 37448 trees of depth 2 - Top down: 2793msecs - Bottom up: 2712msecs Create 8456 trees of depth 4 - Top down: 2621msecs - Bottom up: 3064msecs Create 2064 trees of depth 6 - Top down: 3042msecs - Bottom up: 2922msecs Create 512 trees of depth 8 - Top down: 2485msecs - Bottom up: 1972msecs *Total memory:7938016 bytes *Free memory:197488 bytes

Comple

OxBenchmark





Quadrant



BRAINSTORM



Fractals



Matrix Generation







PowerUsageSummary



TIMELINE





PROJECT FLOW



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FLOATING POINT

- What is Linpack?
- What is the credibility?



Diagonal Dominant Random Sparse

- What benchmarks were used?
 - Matgen
 - Epsilon
- How is it used?





• Why Fractals?

Mandelbrot set
 - {Algorithm} = Z(n)^2 + C



• Source (Bryne)



GRAPHICS - OPENGL ES

- What is it and why should we care?
- Components benchmarked:
 - Empty Surface Area
 - Textured Cube with rotation
 - Shader integration

– Results





GRAPHICS - PROCESSING

What is it and why should we care?

- Components benchmarked:
 Basic animated sprite
 Recursively-constructed
 fractal tree
 - Results (so far)



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ARTIFICIAL INTELLIGENCE

- What are these and why should we care?
- Components benchmarked:
 Immanuelz (a Goal-Oriented Behavior simulation)
 - Results (so far)







• How to benchmark power?

• Papers:

An Analysis of Power Consumption in a Smartphone – Aaron Carroll, NICTA and University of New South Wales



• Why is it difficult?



IMPROVEMENTS/CHALLENGES

- Power Benchmarks
- Pushing phones harder
- Networking scores

- What is CPU usage?
- Threads
- Emulator Limitations

CONCLUSION

- The difficulty with cross library benchmarks
- Importance of overhead
- Is the NDK really necessary?



Intense

Very Hard

How conclusive are these benchmarks?