Programming Project Shield and Tegra 4

Andrew Edelsten (Manager, Tegra Developer Technologies)
Richard Seis (Senior Engineer, Tegra Developer Technologies)
Overview

- Tegra 4
- Project SHIELD
- NVIDIA development tools for Android
  - Samples and base NativeActivity projects
  - Nsight Tegra, Tegra Profiler & PerfHUD ES
- Game considerations for Project SHIELD
Tegra 4

“NVIDIA Tegra 4 is a promising processor that’s going to bring a whole new level of gaming to mobile devices.”

SLASHGEAR

“If you enjoy the web browsing experience on your iPad, you’re going to be pretty pleased what NVIDIA has to offer here.”

ENGADGET

Hottest gadgets

MWC 2013

Better photography:

HOTTEST Gadgets

MWC 2013

CNN

“Better photography: NVIDIA Tegra 4

HDR camera

If you want to take better pictures on your mobile device, NVIDIA’s Chimera computational photography engine is the technology you’ve been waiting for.”

LAPTOP

THE PULSE OF MOBILE TECH
# Tegra 4 Family

## Tegra 4 (“Wayne”)

**World’s Fastest Mobile Processor**

- **Superphone / Tablet**
- **Quad CPU**
  - Cortex A15, 4+1
- **NVIDIA GPU**
  - 72 Core
- **LTE**
- **Chimera***
  - Optional with i500

## Tegra 4i (“Grey”)

**1st Integrated Tegra 4 LTE Processor**

- **Smartphone**
- **Quad CPU**
  - Cortex A9 r4, 4+1
- **NVIDIA GPU**
  - 60 Core
- **LTE**
  - Integrated i500

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* Chimera is NVIDIA’s Computational Photography
Mobile Processor, Ultrabook Performance

Intel Core i3-2377m 1.5GHz, Core i3-3217U 1.8GHz & Core i5-2467m 1.6GHz, Core i5-3317U 1.7GHz all have 17W maximum TDP
Competitive data published on Geekbench website; Tegra 4 1.9GHz measured on reference platform
Project SHIELD
Project SHIELD

- Tegra 4 powered
- 5 inch 720p & multitouch display
- Console grade controller
- High speed Wi-Fi
- Full connectivity (HDMI, USB, microSD, headphone)
- Pure Android (currently Jellybean)
Tuned Port, Bass Reflex Speakers
Two Open Platforms - One Amazing Portable

Android

PC
Controlling the Controller

Richard Seis (Senior Engineer, Tegra Developer Technologies)
Controllers: Quick Overview

- Controllers have been annoying
  - There is no controller standard
  - Controllers can output what they like
- Supporting multiple controllers like this is a real headache
Android has the ability to help
- But few translation ("KL") files
- Supporting multiple controllers like this still a headache
Controllers: NVIDIA is helping

- Since ICS, included KL’s for popular controllers
- We have documentation on this normalization
- Supporting multiple controllers like this still a headache
Controllers: Built for NVIDIA Tegra

- Not a proprietary standard
- Developed for controller manufacturers
- Normalization at the hardware level
- See native_gamepad sample for correct input handling - http://developer.nvidia.com/tadp
Controllers: Your Game

- Games under 20fps feel sluggish
- Test your game using HDMI too
  - Look at big screen and small screen
  - Performance hit
- Auto-detect the controller and use it
- You can do multiple controllers!
- Explain complex controls
- Remove on-screen controls
- Code to the normalized controller
  - Built for NVIDIA Tegra
Controllers: Your UI

- Don’t forget your UI!

- Have a visual indicator of focus

- Use classic standards for navigation
  - 6 and 9 o’clock - Yes
  - 12 and 3 o’clock - No

- Every function must be usable
  - Sliders, buttons, etc.

- Have EXIT item on Main/Pause menus
  - User may be 10’ away from touch screen
Questions?

- Andrew Edelsten
- Richard Seis

- NVIDIA Developer Zone

- Next up in this room:
  - Paul “Hodge” Hodgson with “Optimizing Tegra Apps and Games Using Unity”
  - Stephen Jones with “Performance & Debugging Tools for Tegra”