



# **OpenGL ES Update**

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**OpenGL ES Working Group Chair**

# What is OpenGL ES?

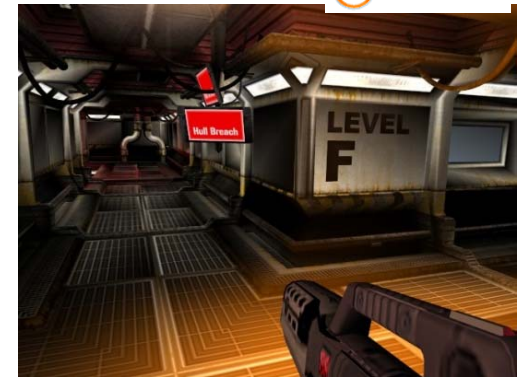
## OpenGL for mobile devices

- Gets rid of redundant / legacy features
- Extensions to make it mobile-friendly
- All the functionality of the desktop API



## Versions

- ES 1.0 / 1.1: fixed function
- ES 2.0: shader-based via GLSL ES



## A huge success!

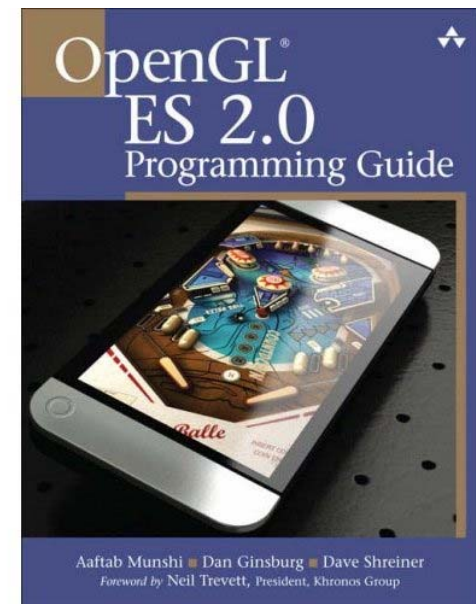
- The dominant native 3D API for mobile devices
  - Products from every major cell phone manufacturer
- Moving rapidly into other embedded markets
- >> 100M units shipped



# What's New in 2009

## OpenGL ES 2.0 platforms are shipping!

- Available in several popular handsets
- Coming soon to set-top boxes, navigation devices, etc.
- SDKs, books available



# Working Group Activities

## Conformance Tests

- OpenGL ES 1.1 and 2.0 CTS upgrades released

## KTX file format

- Standard file format for ETC1 compressed textures
- Extended to handle all GL ES formats
- Pixel data payloads can be passed directly to GL
- Specification & sample loader code coming soon

## New technology

- Extensions to ES 2.0 performance / functionality
- Extensions to expose next-generation hardware features

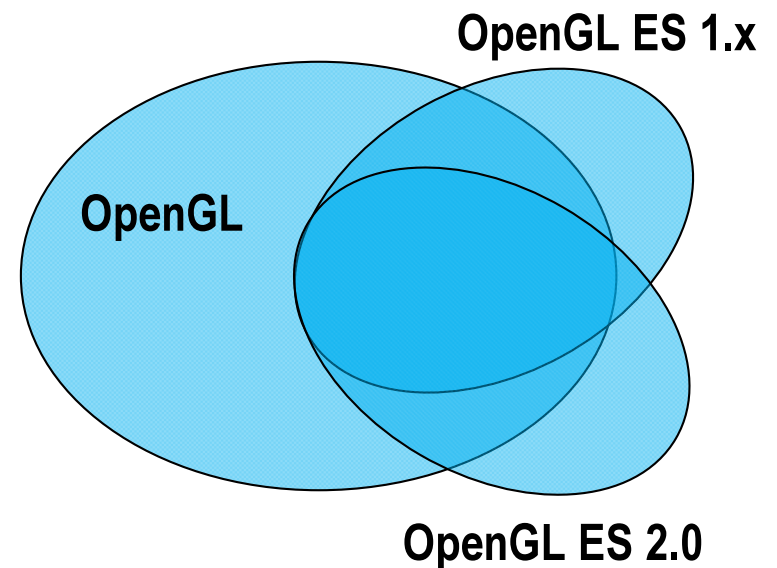
# Improving GL / GL ES Interoperability

## The Dream

- GL Everywhere
- Seamless portability

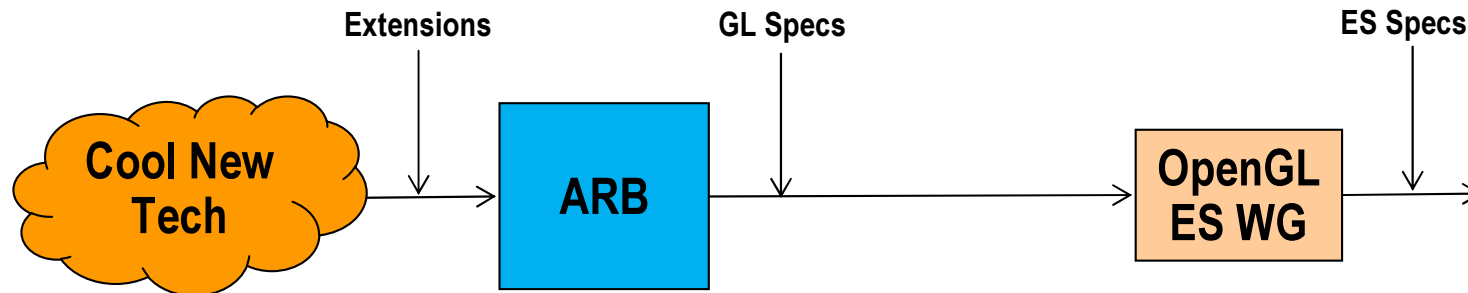
## The Reality

- Relationship between GL and ES is a bit messy
- Porting code is more difficult than it needs to be
- Keeping the APIs in sync is becoming more difficult

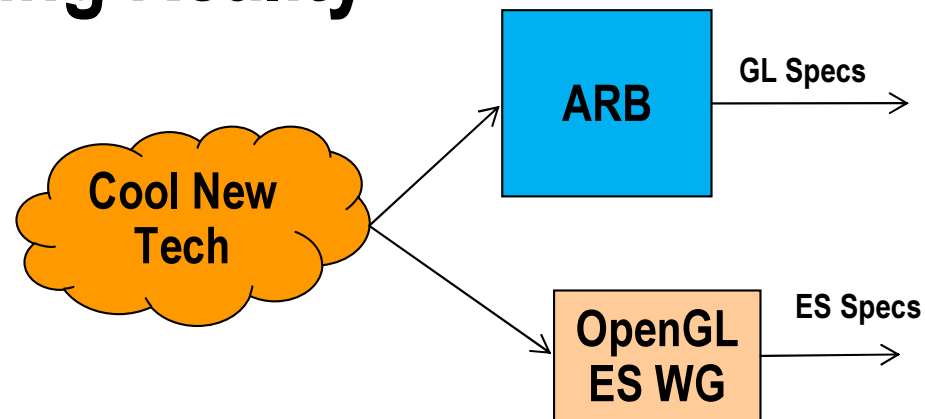


# OpenGL Development Model

## The Model



## The Emerging Reality



# The ARB / ES Convergence TSG

## Introducing the ARB / ES Convergence TSG

- Joint subcommittee of the ARB and the OpenGL ES WG

## Charter

- Encourage information sharing and communication
- Produce joint technology and specification roadmap
- Recommend ways to reduce existing differences over time
- Recommend ways to minimize or avoid divergence in future

## The Future

- Could OpenGL ES become a profile of OpenGL?
  - Not a goal at present, but something to explore



# Thanks to...

## Specification Editors

- ES 1.x, ES 2.0: Jon Leech (Khronos)
- ES Next: Benj Lipchak (Apple)
- GLSL ES: Rob Simpson (Qualcomm)

## Conformance Test Leads

- ES 1.x: Tom McReynolds (NVIDIA)
- ES 2.0: Maurice Ribble (Qualcomm)

**and the Working Group Regulars**