

Android apps

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Agenda

- ◆ Who am I?
- ◆ Where do I work?
- ◆ What do I teach?
- ◆ What do I research?
- ◆ What do I teach in ESIGELEC?
- ◆ An introduction on Android.

who am I?

Presentation

- ◆ Professor at PUC-PR
- ◆ Mobile developer of Pinterest
- ◆ Researcher in GPGPU, games and mobile
- ◆ Developer of mobile Apps for more than 20 years
- ◆ pHD and MD in Computer Science



embarca a previsão é que a obra
comece nas próximas semanas
e terminar no terreno de 20 mil metros
quadrados na região de Penha.
A construção do prédio do Instituto Federal
de Educação, Ciência e Tecnologia (IFRR), o antigo Celet.
A cidade foi contemplada na
última fase do Programa Na-

transformação econômica que
virá com a implementação do
Comperj. Todos esses setores
dependerão de mão de obra qua-
lificada, que vamos formar no
novo instituto federal.

Ainda não há custo definido
para a obra, que será bancada
integralmente com recursos

viarem as documentações
necessárias.

Ano passado, durante visita
de uma comitiva do Congresso Nacional às instala-
ções da Petrobras na Ilha do
Fundão, no Rio de Janeiro,
um diretor pediu uma indica-
ção para uma vaga técnica na

Ilha, o Comperj, e temos
que ter mão de obra capaz de
atender à demanda do setor.
Niterói é uma cidade polo e
deve ter esse papel reafirma-
do — afirma o deputado federa-
lista Chico D'Angelo (PT), que
negociou com Fernando Hen-
rique Cardoso, ex-ministro de Educa-

ção, que o governo queria
Além disso, logística e constru-
ção civil devem também ser im-
plantados — diz o presidente da
Comissão de Educação da Câmera
dos Vereadores, Vitor Junior
(PT), responsável pela organi-
zação da grupo que discutirá
os cursos oferecidos.

explica Gusmão.

Além de Niterói, duas unida-
des serão construídas no Rio
— uma no Complexo do Aé-
rion e outra na Cidade da Deus
— e outras duas na Baixada
Fluminense — em Belford Ro-
xo e em São João de Meriti. ■

Pedro Teodoro

Incubadoras são o ensaio para a criação da primeira empresa

Universidade ajuda empreendedores a ingressarem no mercado de trabalho

Luis Gustavo Schmitt
lgschmitt@uol.com.br

Uma salinha apertada e escondida sob a escada do corredor do quinto andar da Faculdade de Engenharia da UFF, no campus da Praia Vermelha, abriga o Laboratório de Mídias Digitais e Novas Tecnologias. O local é uma usina de inovação e uma espécie de garagem de Steve Jobs (local onde o bruxo da Apple começou a montar os seus primeiros

uma boa ideia para criar um
negócio, mas não têm dinheiro
ou um espaço para trabalhar.

Marcelo Zamith, de 35 anos,
Mark Joselli, de 30, e José Ri-
cardo da Silva Junior, de 31, conheceram-se no doutorado
em Computação. Desde 2008,
o trio pesquisa Tecnologia de
Computação em Alta Performance
para identificar a topografia de poços de petróleo. O
estudo rendeu frutos e, em
2009, eles foram contratados
pela Petrobras.

— Aplicamos placas gráficas
a óleos, com realidade aumentada.

óleo. Um processo que chejava
e levava três dias passou a ser feito
em horas — conta Zamith.

O projeto de pré-incubação
precede a criação de uma em-
presa na estrutura da universida-
de. O coordenador acadêmico
da Incubadora da UFF, Sérgio
Macena, explica que os em-
preendedores aproveitam a es-
trutura da instituição para cons-
olidar seu modelo de negócio.

— Eles recebem todo o
apoio necessário para que
possam sobreviver no merca-
do. Passam a ter assessoria
com Sib, jurídica, marketing,

desenvolvimento da IBM Diagnósticos,
que funciona por meio de uma
parceria da UFF com o Instituto
Vital Brazil. A empresa, que con-
ta com assessoria de alunos da
universidade, é especializada em
exames de sangue em papel de
filtro. As amostras são colhidas
por meio de uma agulha e ficam
marcadas no papel. A IBM já apli-
cou os testes em 79 municípios do
estado pela rede do SUS.

— Essa técnica permite que
oitro exames de pré-natal sejam
feitos de uma só vez. Anteriormente, era preciso que a
gestante fizesse os exames se-



Newspaper of my first startup.



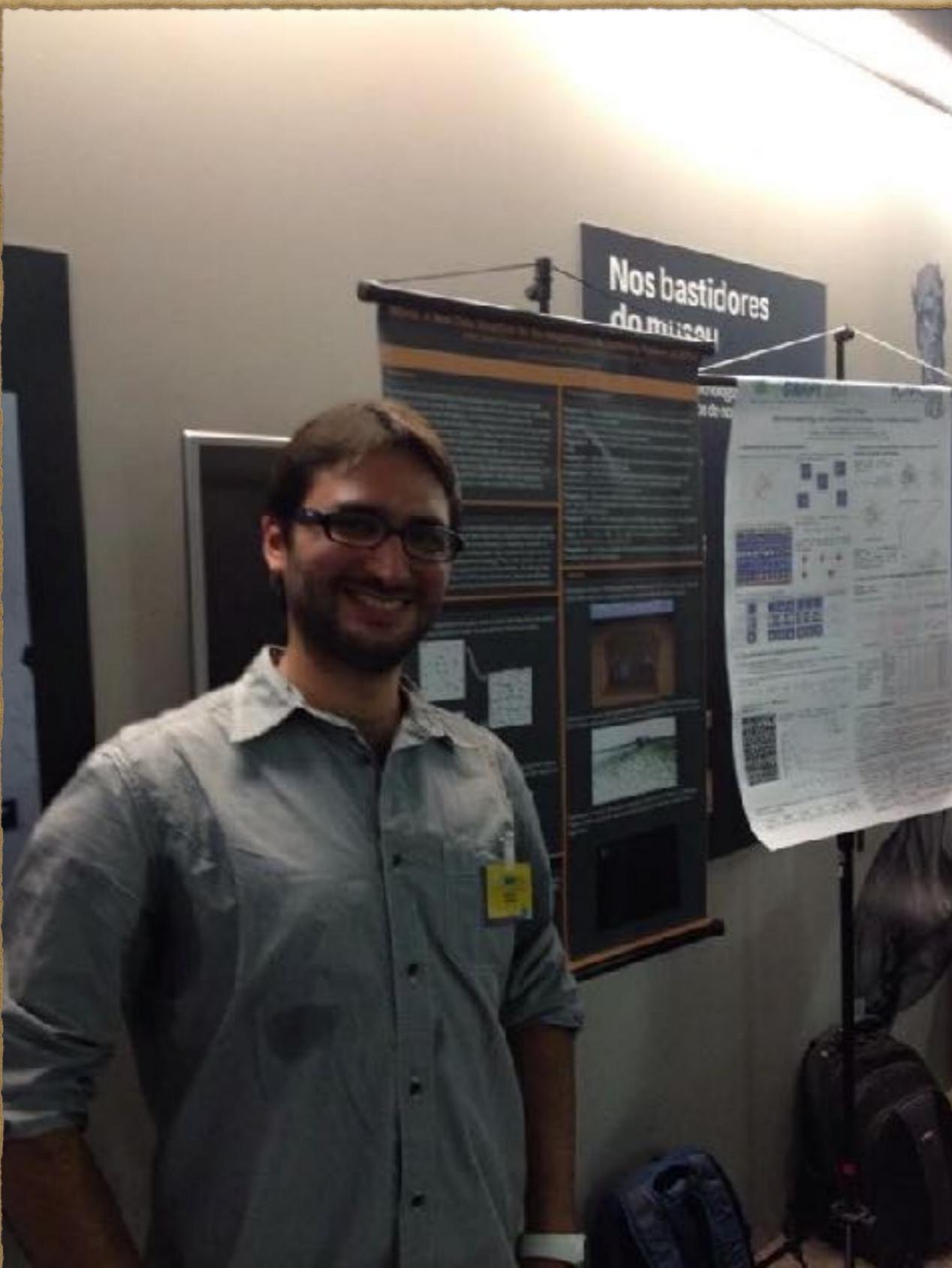
Content

Advertising

Content

MobileTv

I was part of the team that developed the first TV for
mobile of Latin America



Got the Best pHD
Thesis in Brazil of 2014

Won the Apple
Distinguished Educator in
2015





One of my students received the Apple Design
Awards for best game



Another has received best series game for a game
that teach deaf children how to read.



And a group of students were
hackaton winners

Where do I work?

PUCPR

- ◆ Pontifical Catholic University of Paraná
- ◆ Located in Curitiba in the State of Paraná
- ◆ More than 31,000 students
- ◆ Five academic units:
 - ◆ the Center for Biological and Health Sciences,
 - ◆ the Center for Exact Sciences and Technology,
 - ◆ the Center for Juridical and Social Sciences,
 - ◆ the Center for Humanities and Theology,
 - ◆ and the Business School.



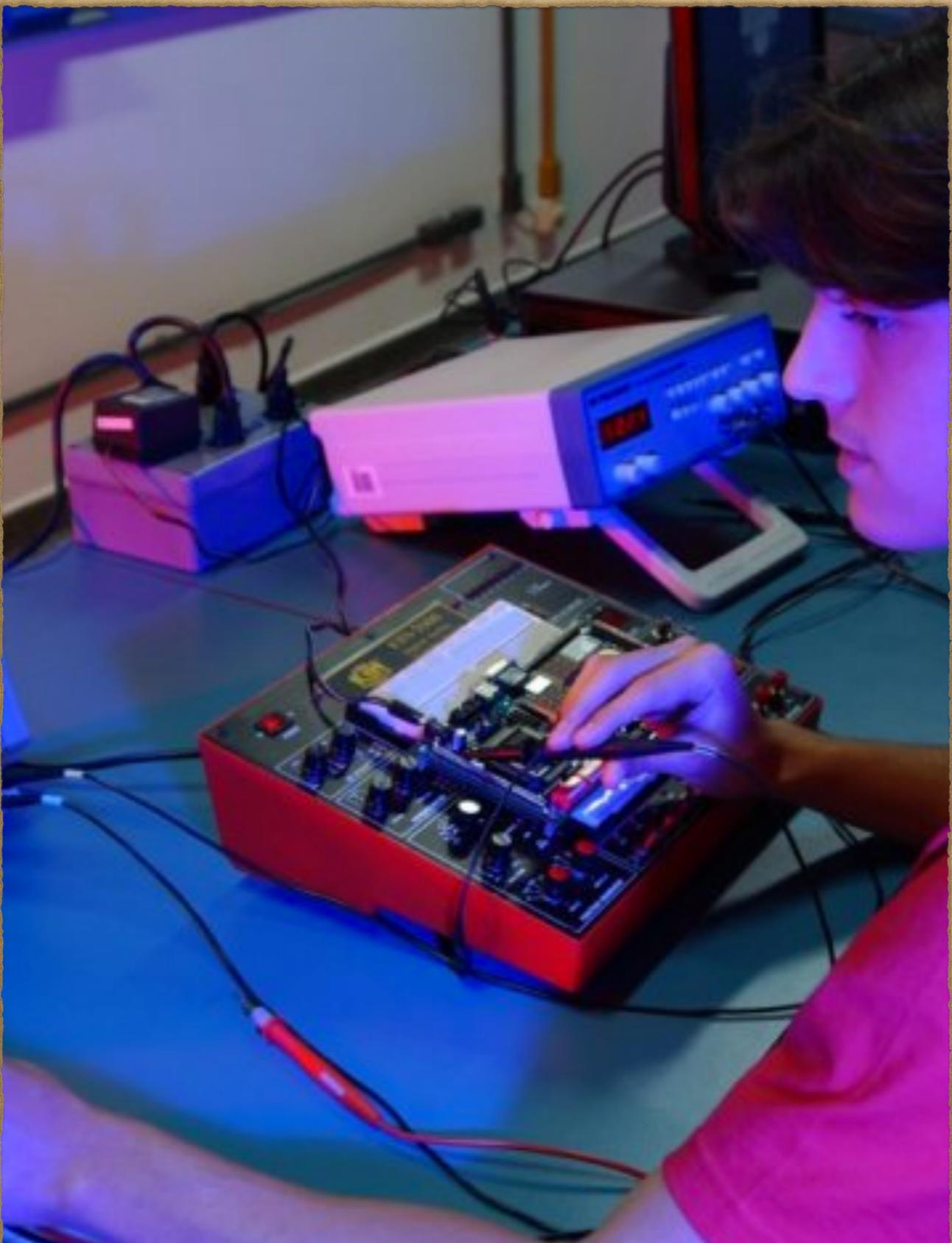
PUCPR

- ◆ PUCPR offers graduation, MBA, Master and PhDs courses in different fields;
 - ◆ 63 graduation courses;
 - ◆ 175 pos graduation courses
 - ◆ and more than 2,000 R&D projects with more than 100 patents
- ◆ PUCPR has a central biblioteca, laboratories equipped with computers, projectors
- ◆ Focus on Teaching, Research, Innovation and Internationalisation

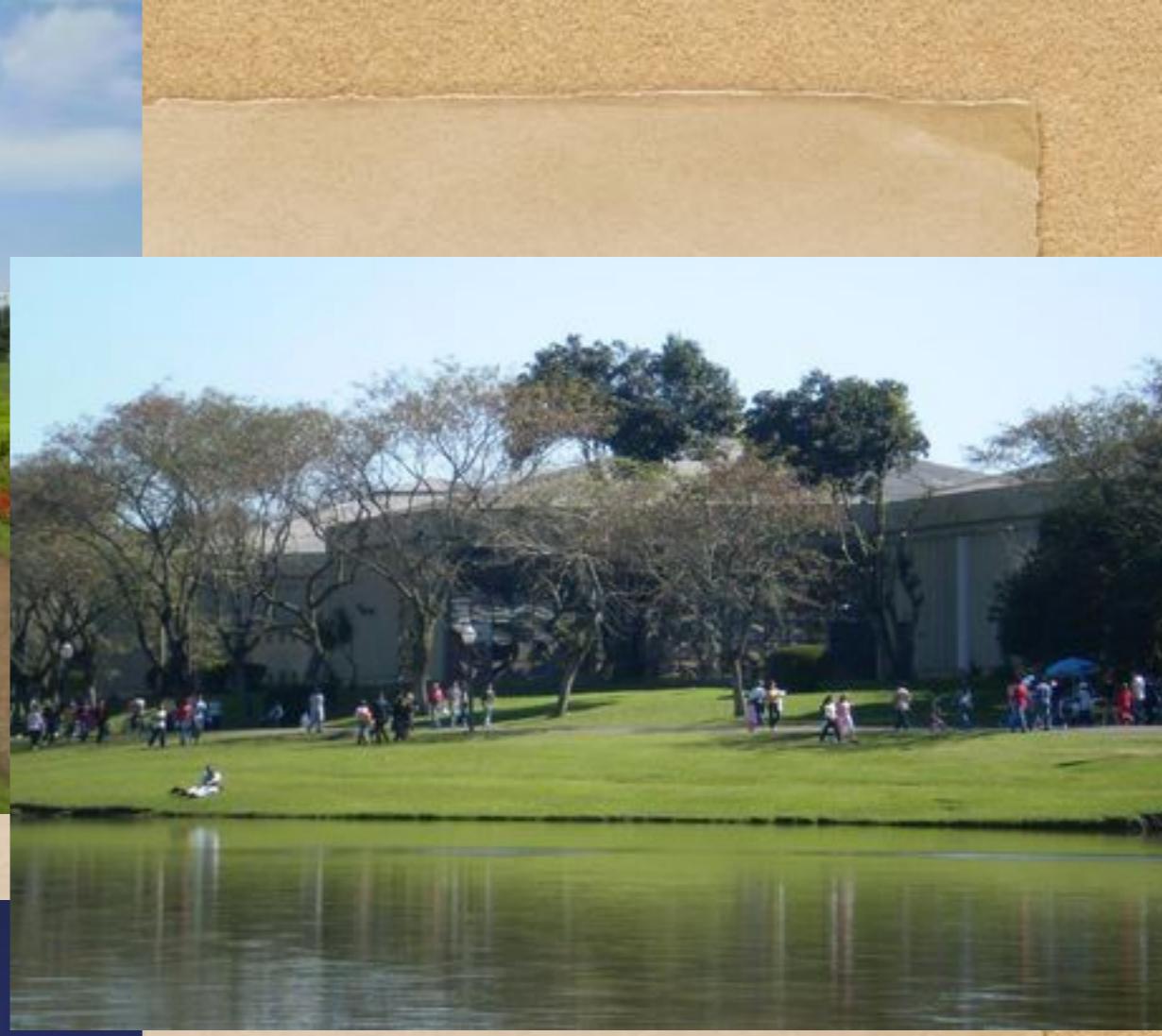


 MIC CWB







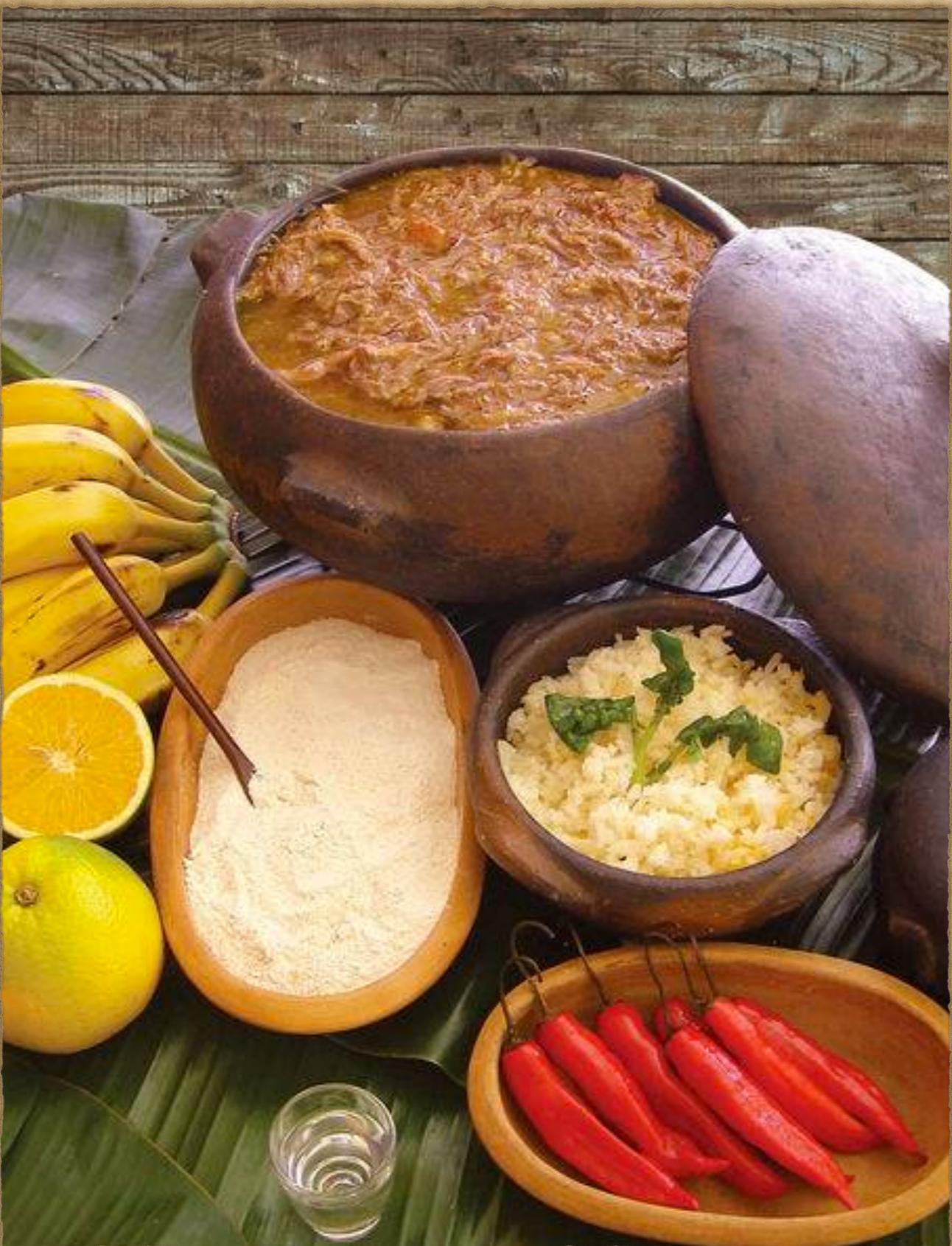












what do I teach?

Games/Mobile Development

- ◆ I teach on the Graduation Program and PostGraduation Program
- ◆ Subject:
 - ◆ Mobile Development
 - ◆ Game Development
 - ◆ Blockchain development



- ◆ A 2 year program with concentration on the development of apps for iOS
- ◆ They develop an app and also a startup

James
Delivery
startup that delivers
convenience to your home





Super pads
Create and Play top songs



Jump-o

Minimalist game



Vector Race

Autorama game

Eternal

Social network that help
plan a marriage party



eternal

A rede social do seu Casamento



Acesse com o Facebook

Entrar

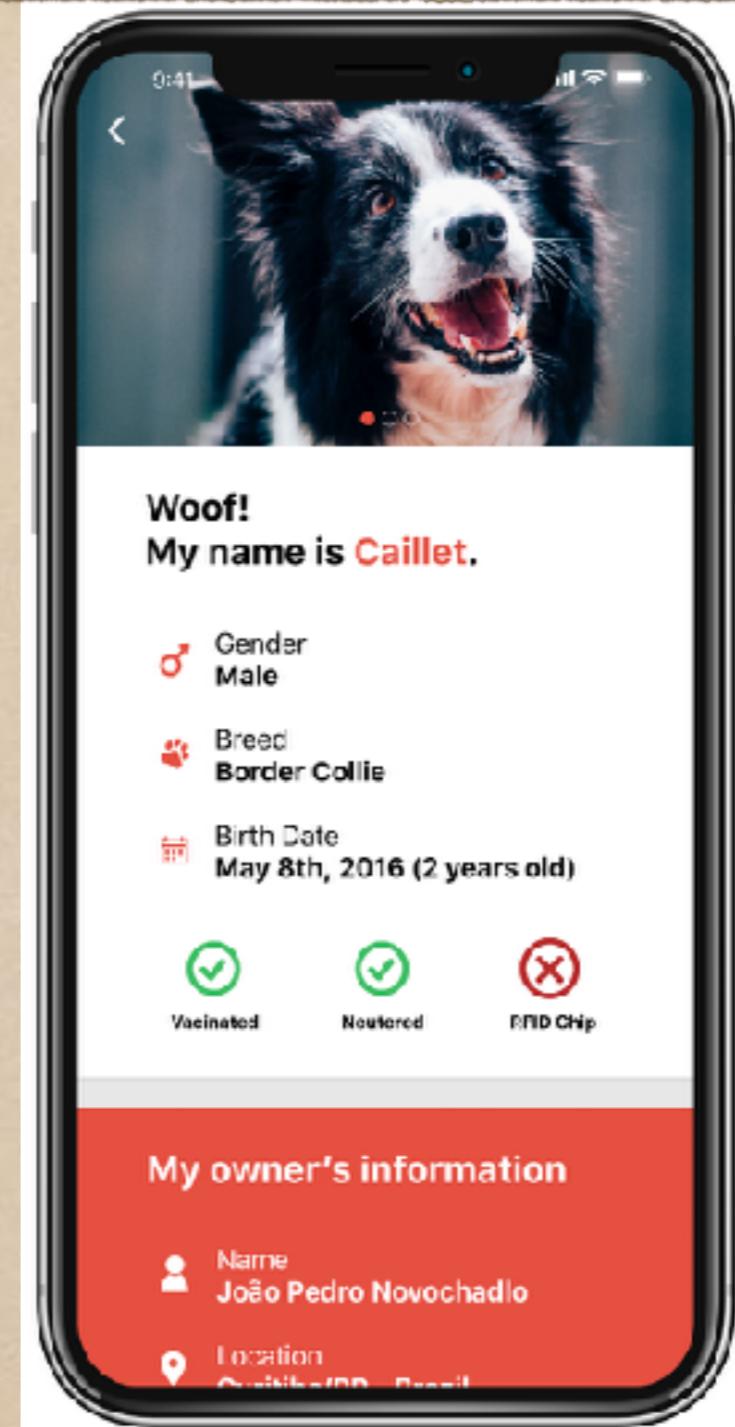


Wyz

Game to help deaf children to read

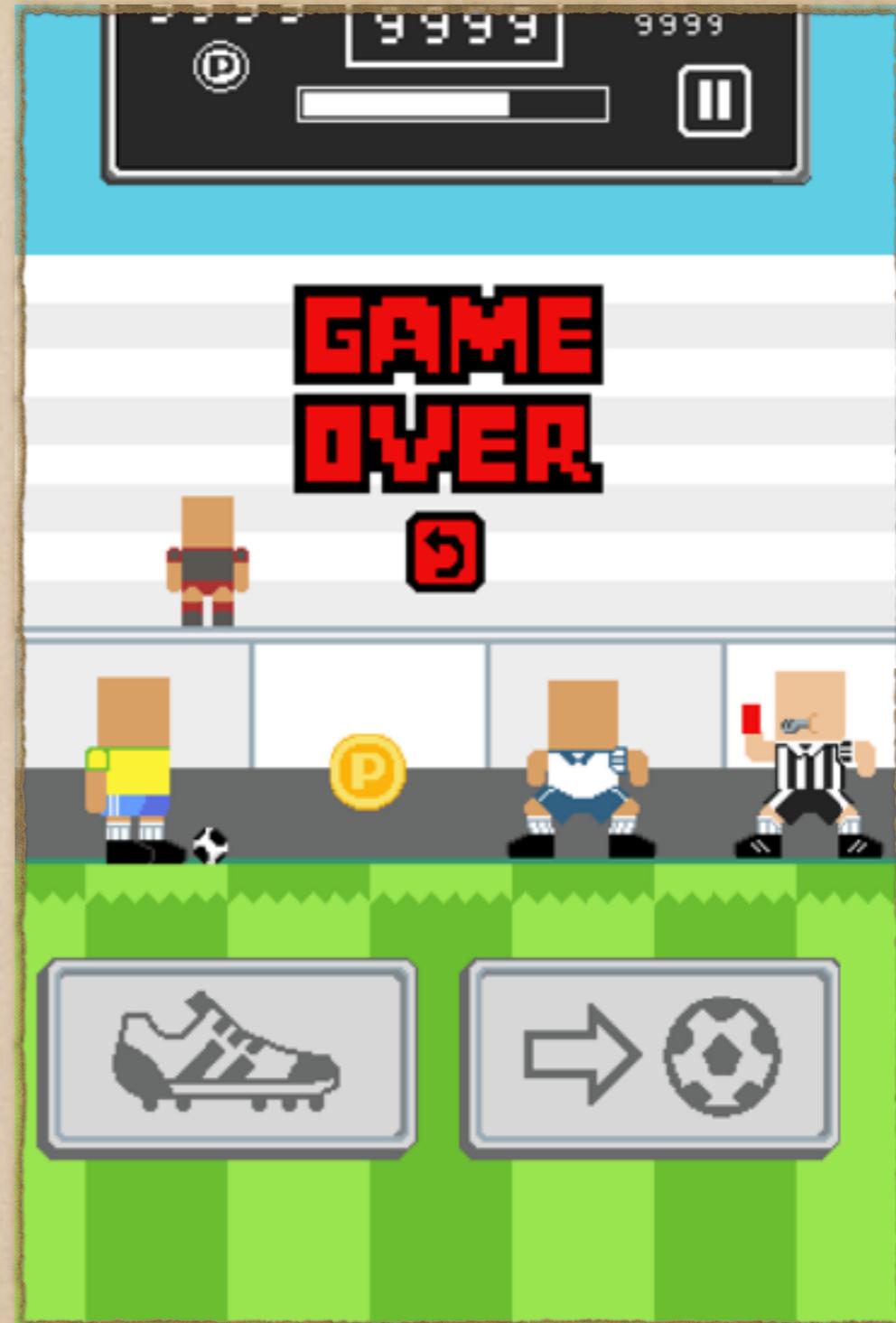
Kryptags

App with nfc technology to
track pets



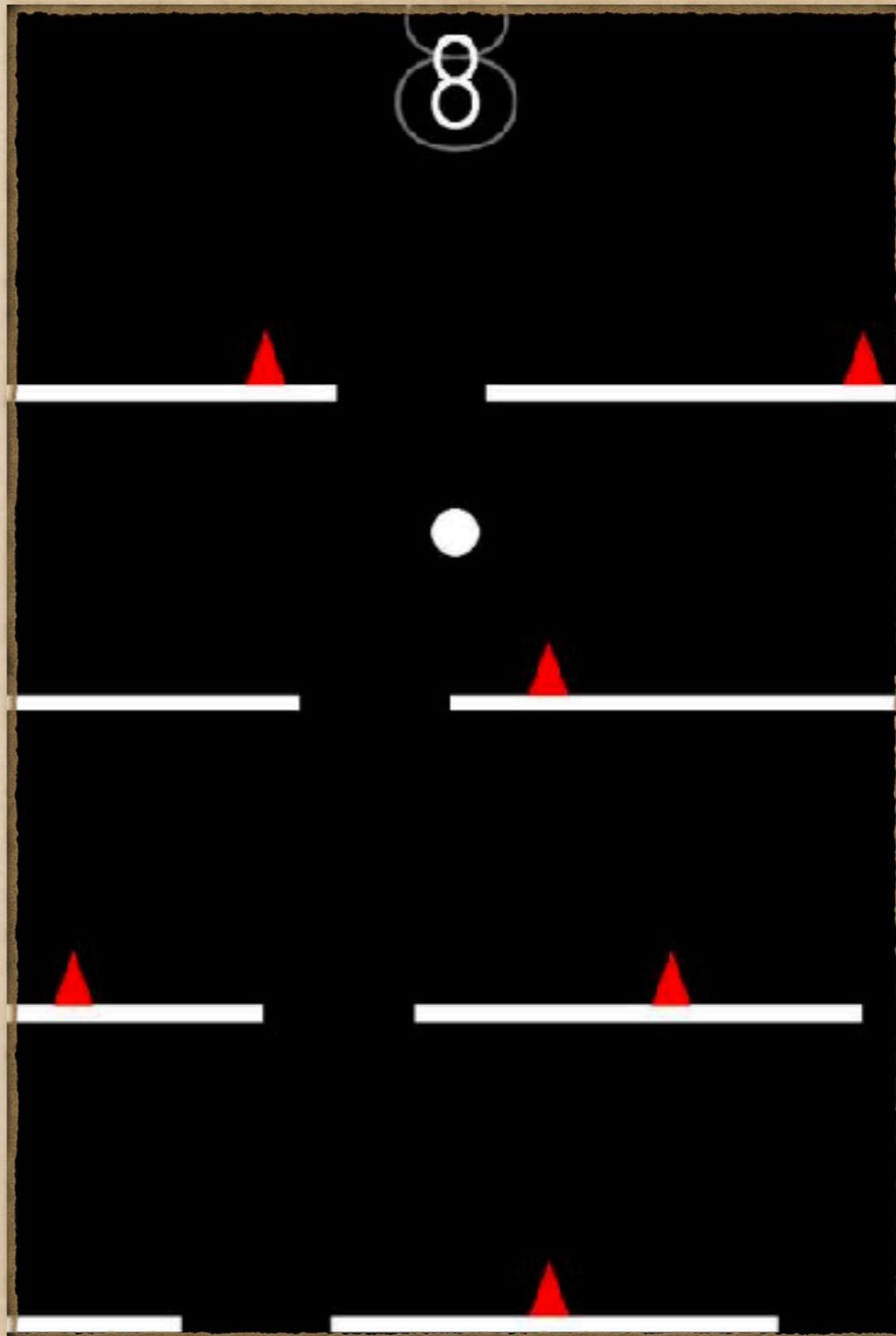
Soccer Runner

Hyper casual game



Linear Jump

Hyper casual game



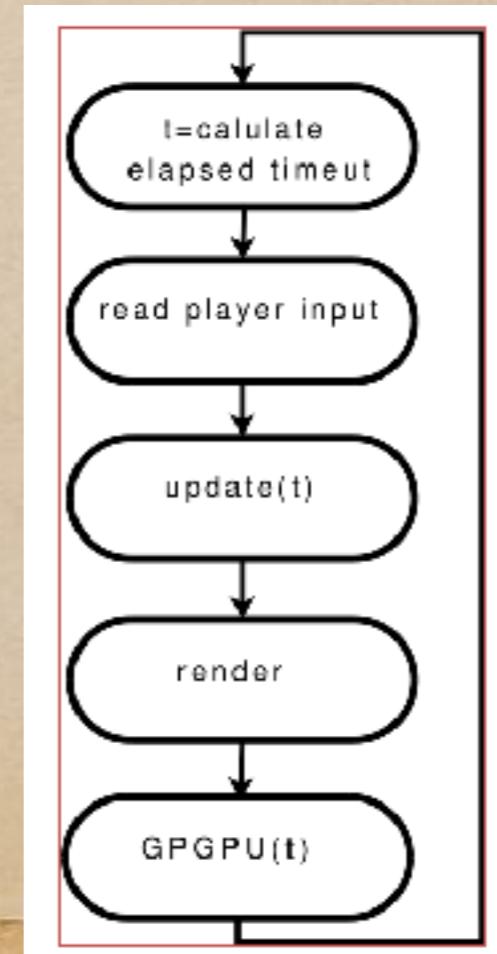
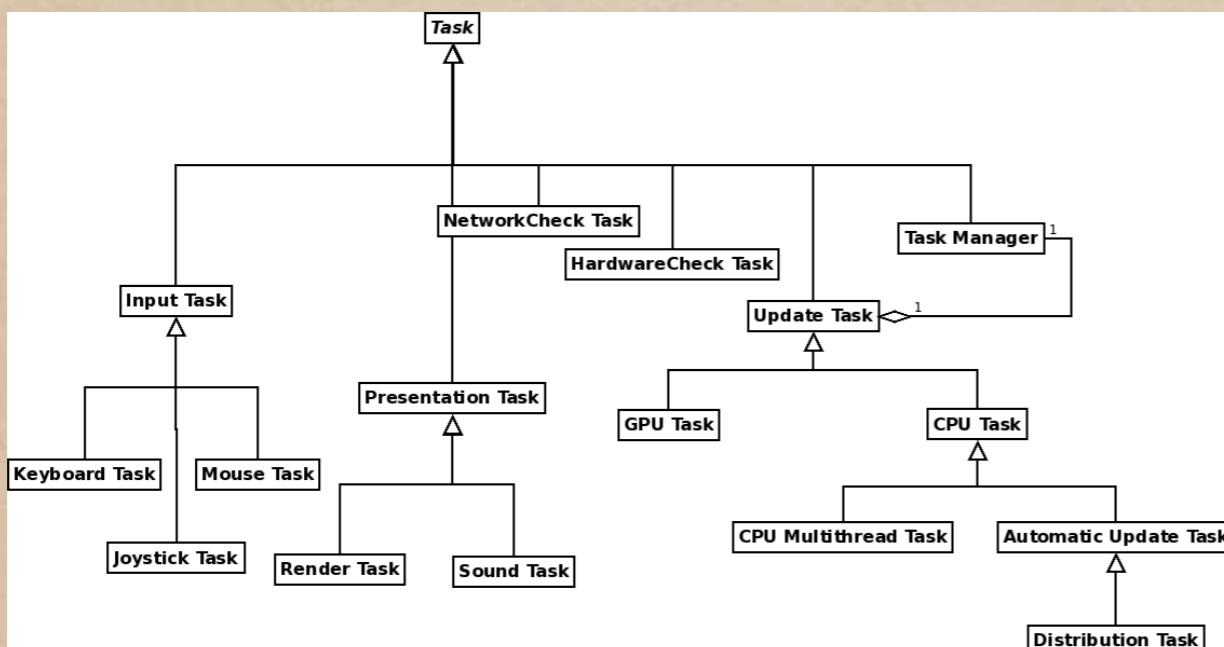
Bottle Stack

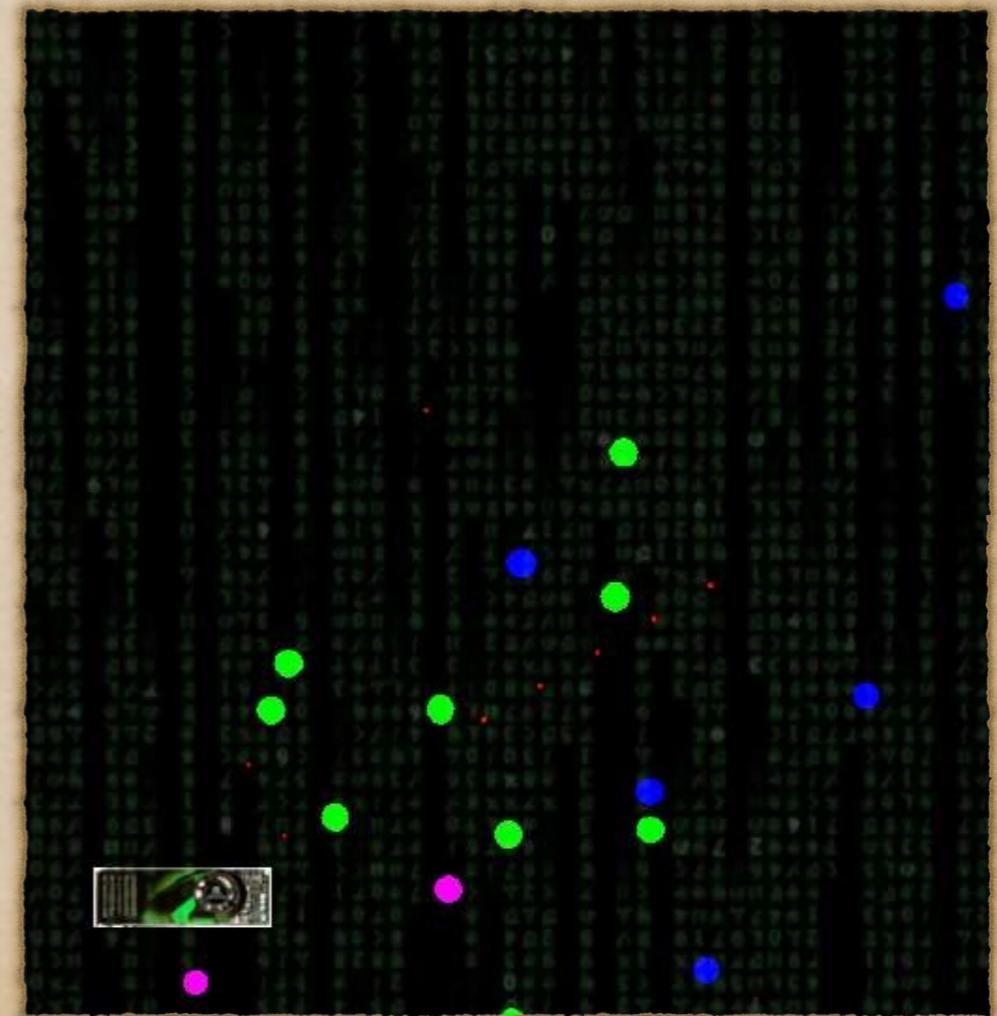
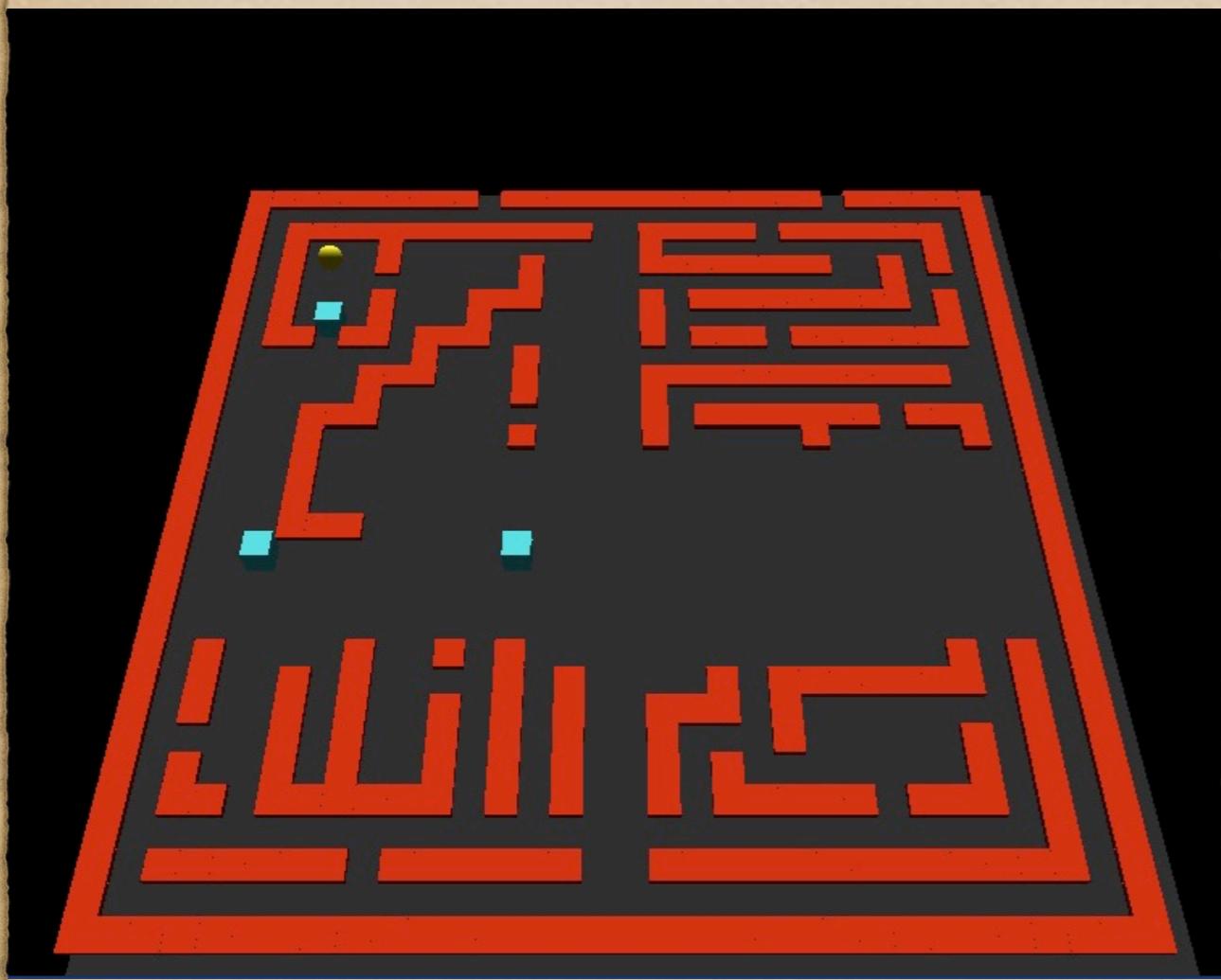


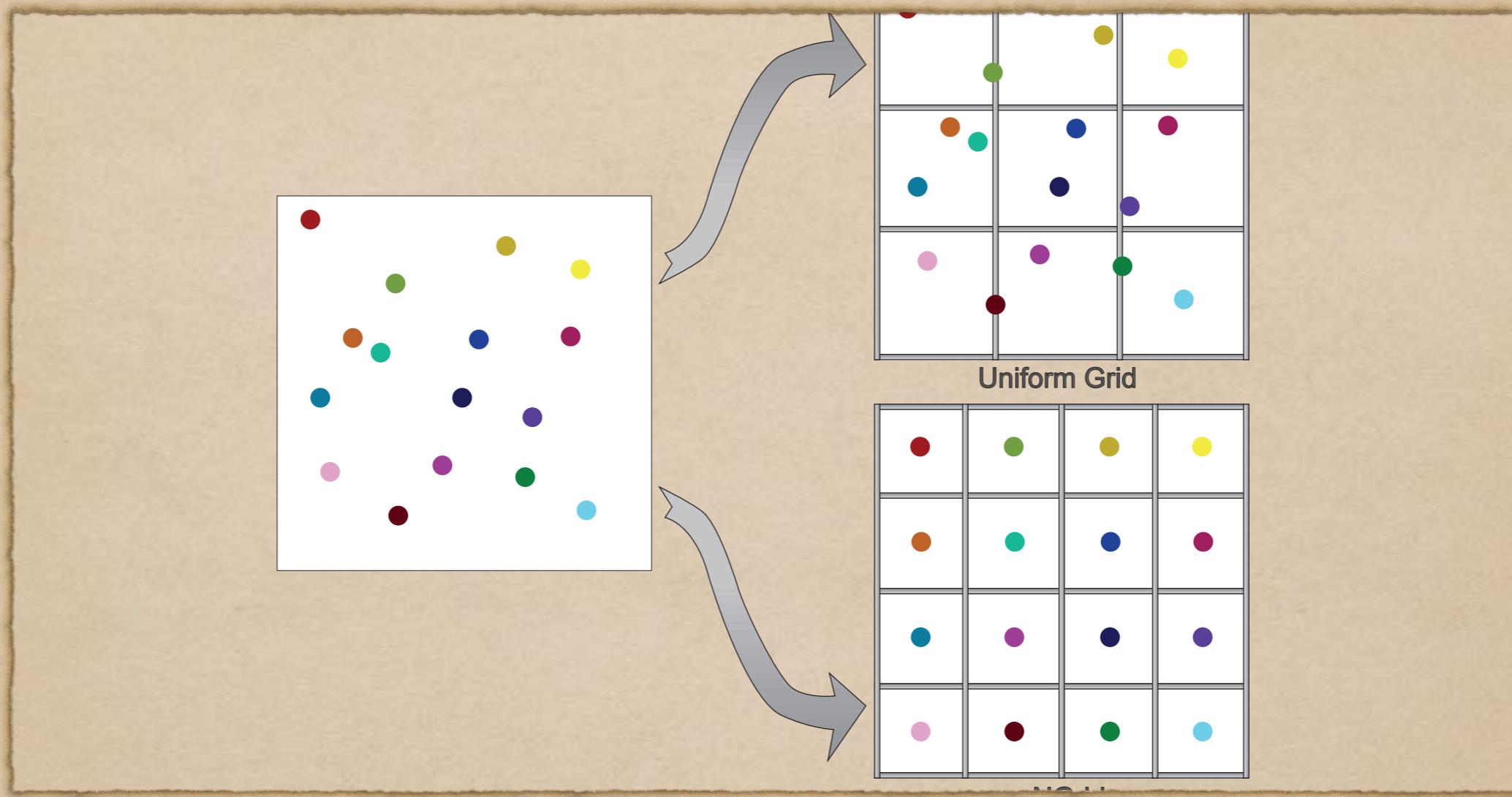
What do I research?

New Game Architectures

- ◆ How to develop new architectures and framework in games to get the best of the hardware.

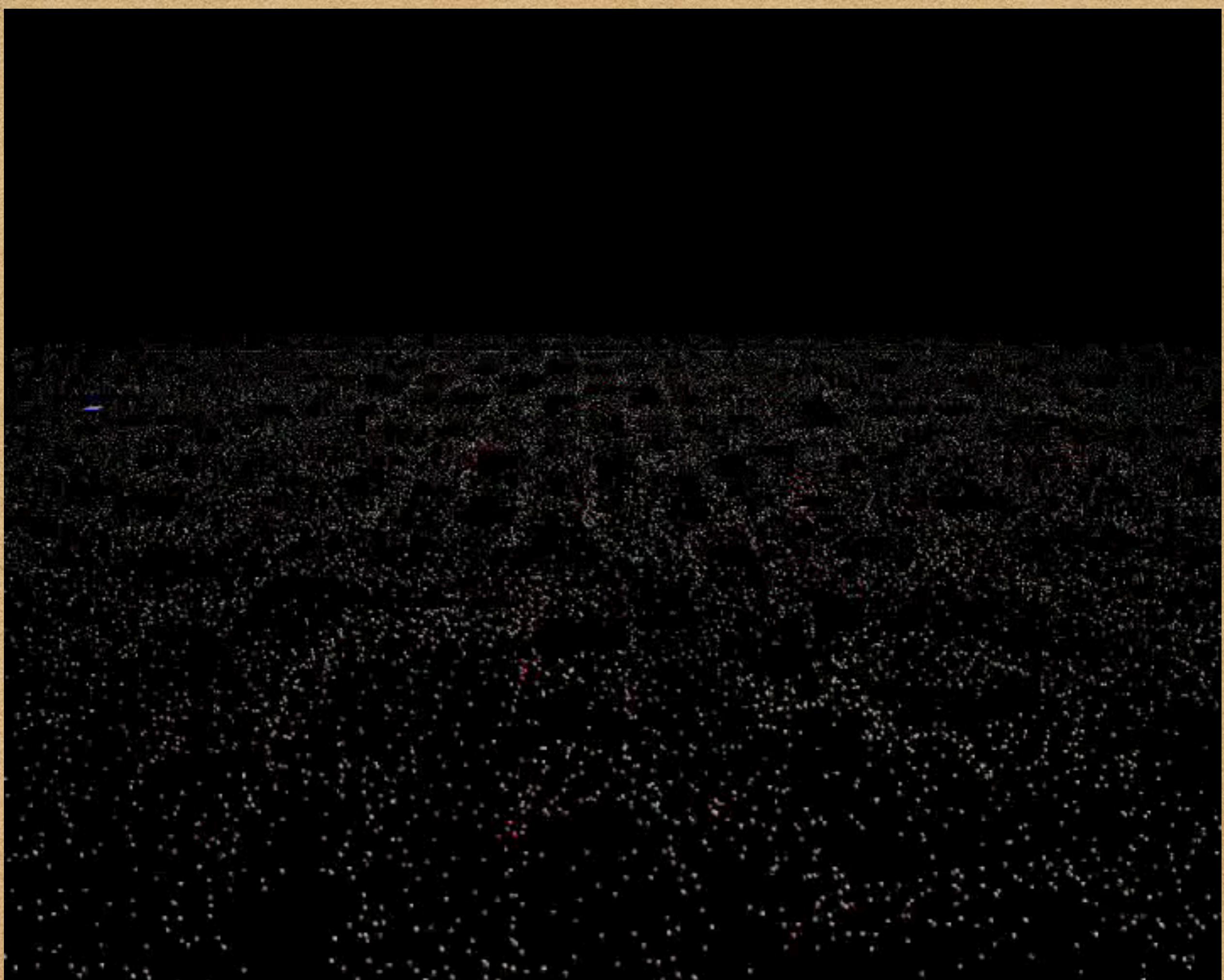






Data Structures

Created a new Data Structure for games and
interactive applications.



Points: 202

FPS: 100



GPU Wars

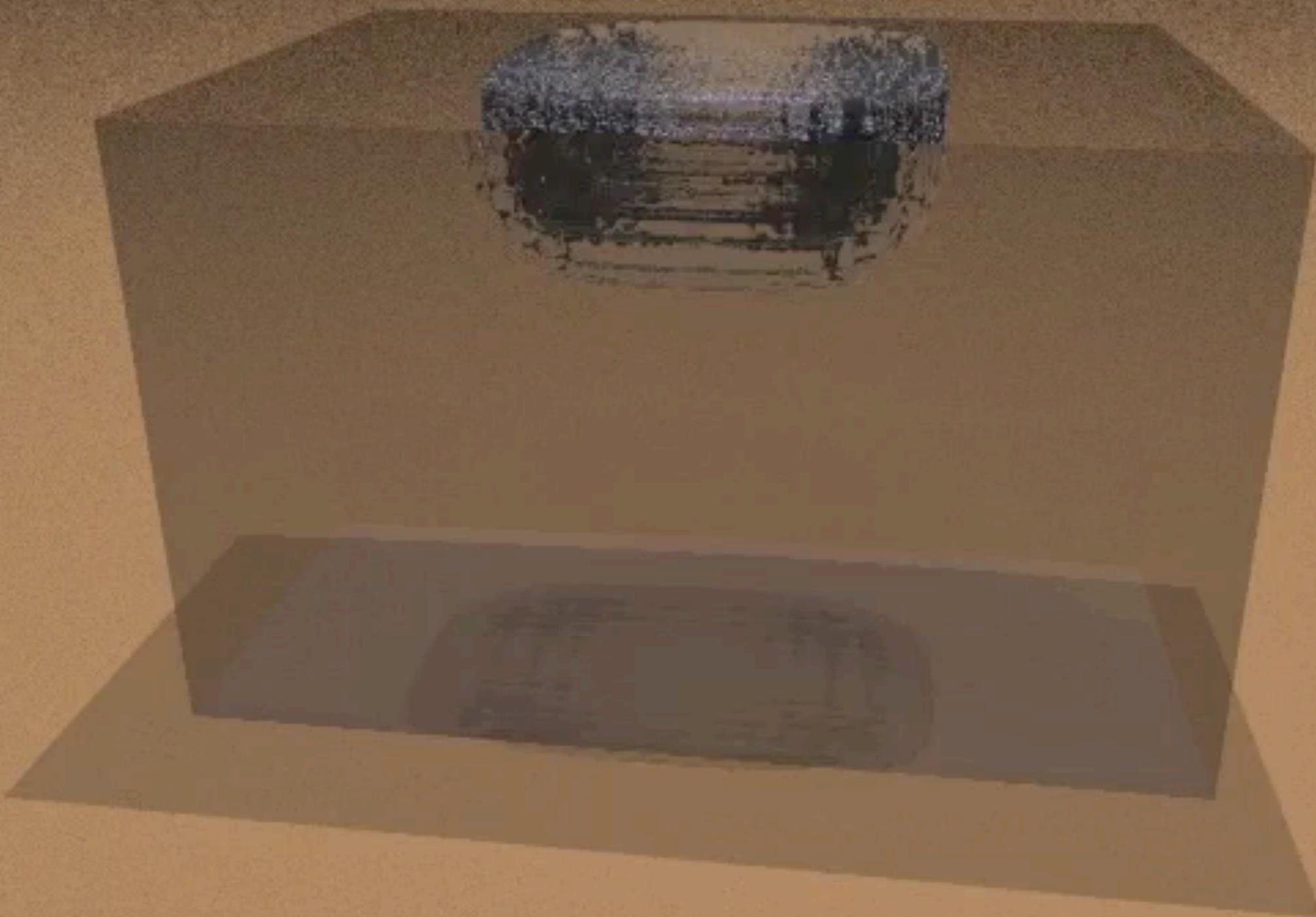


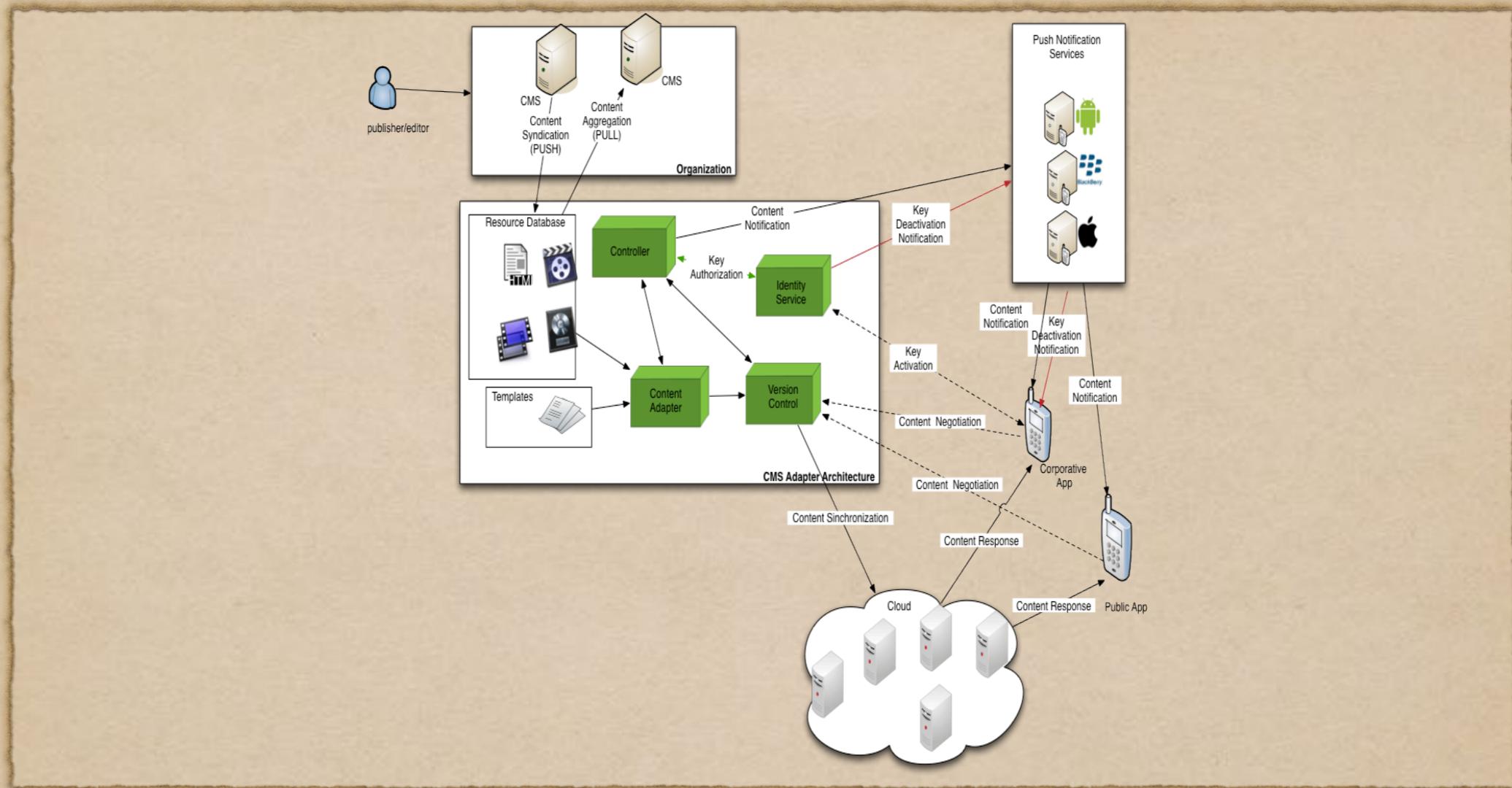


RsBalls

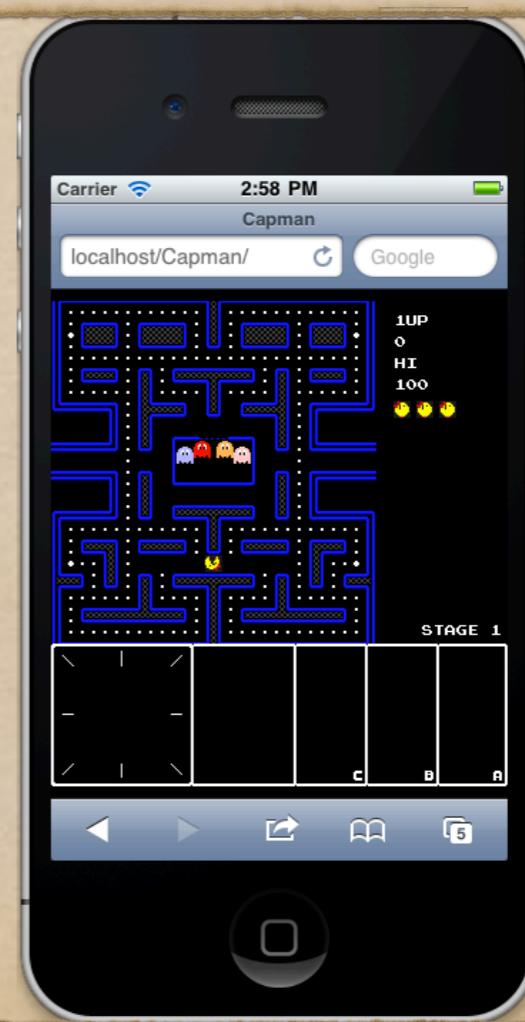
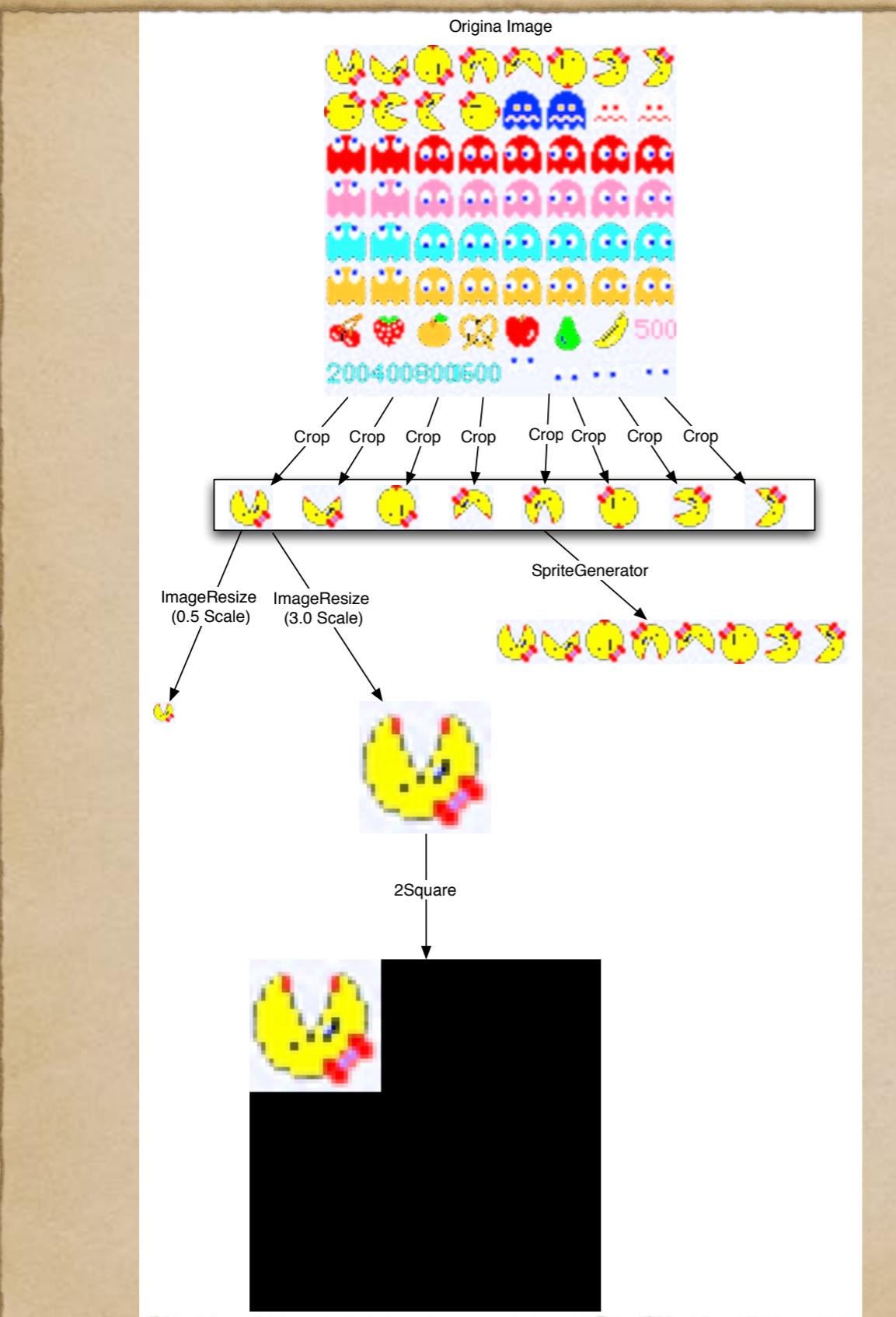
particles1024

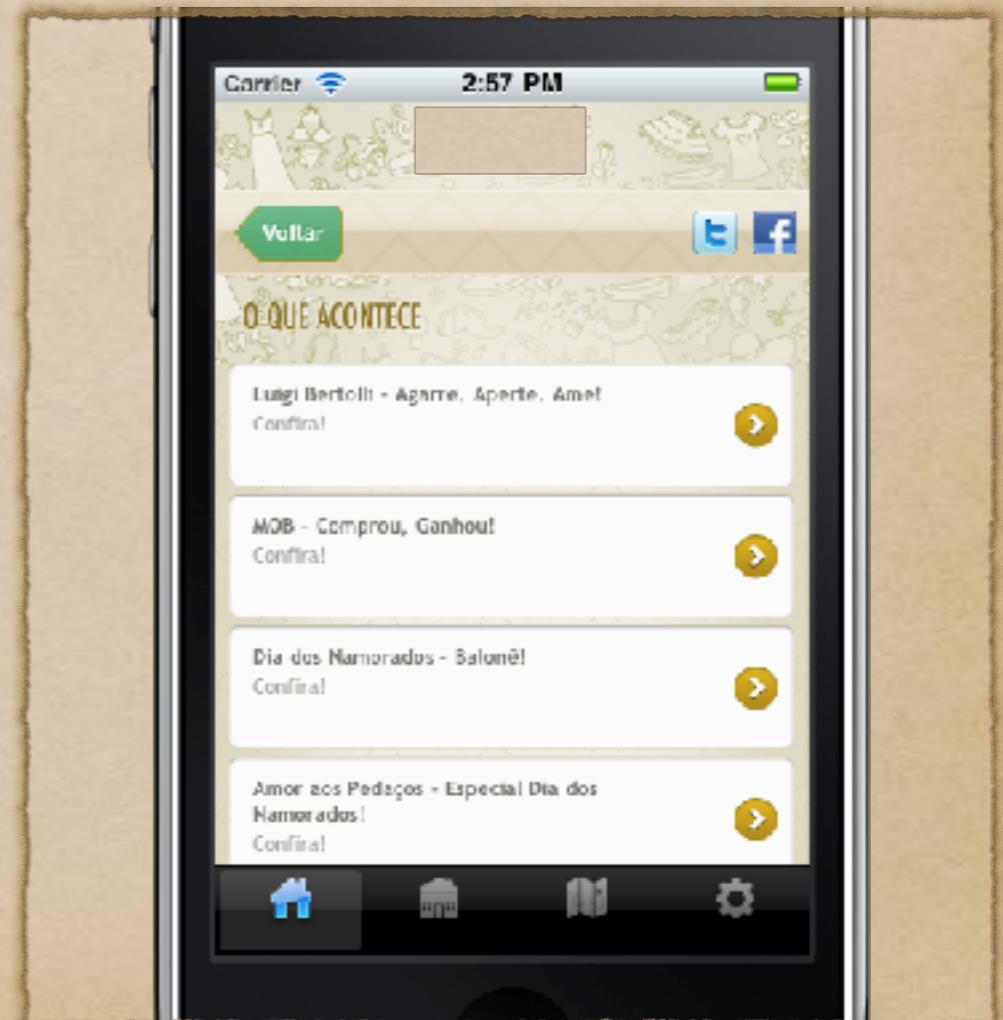
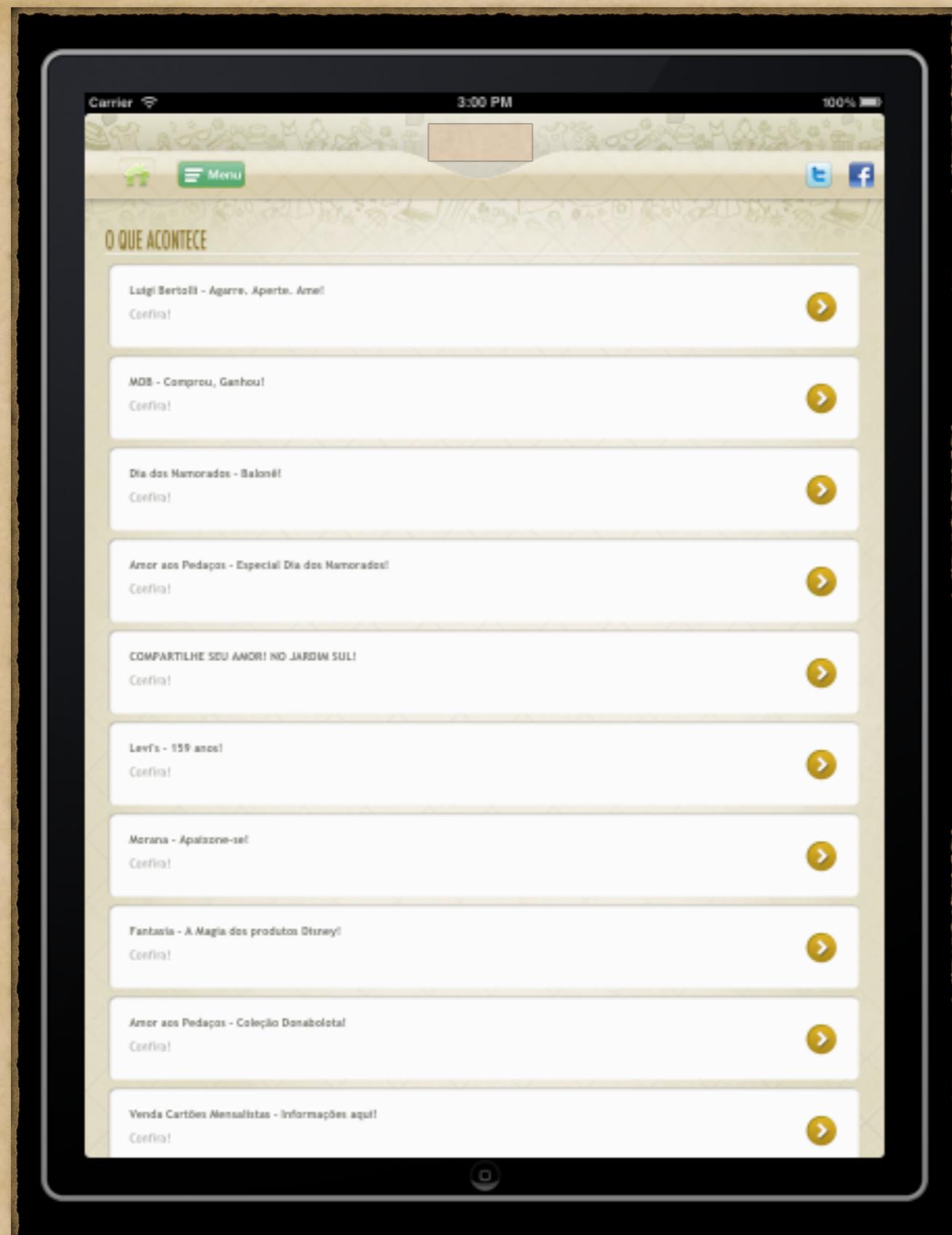


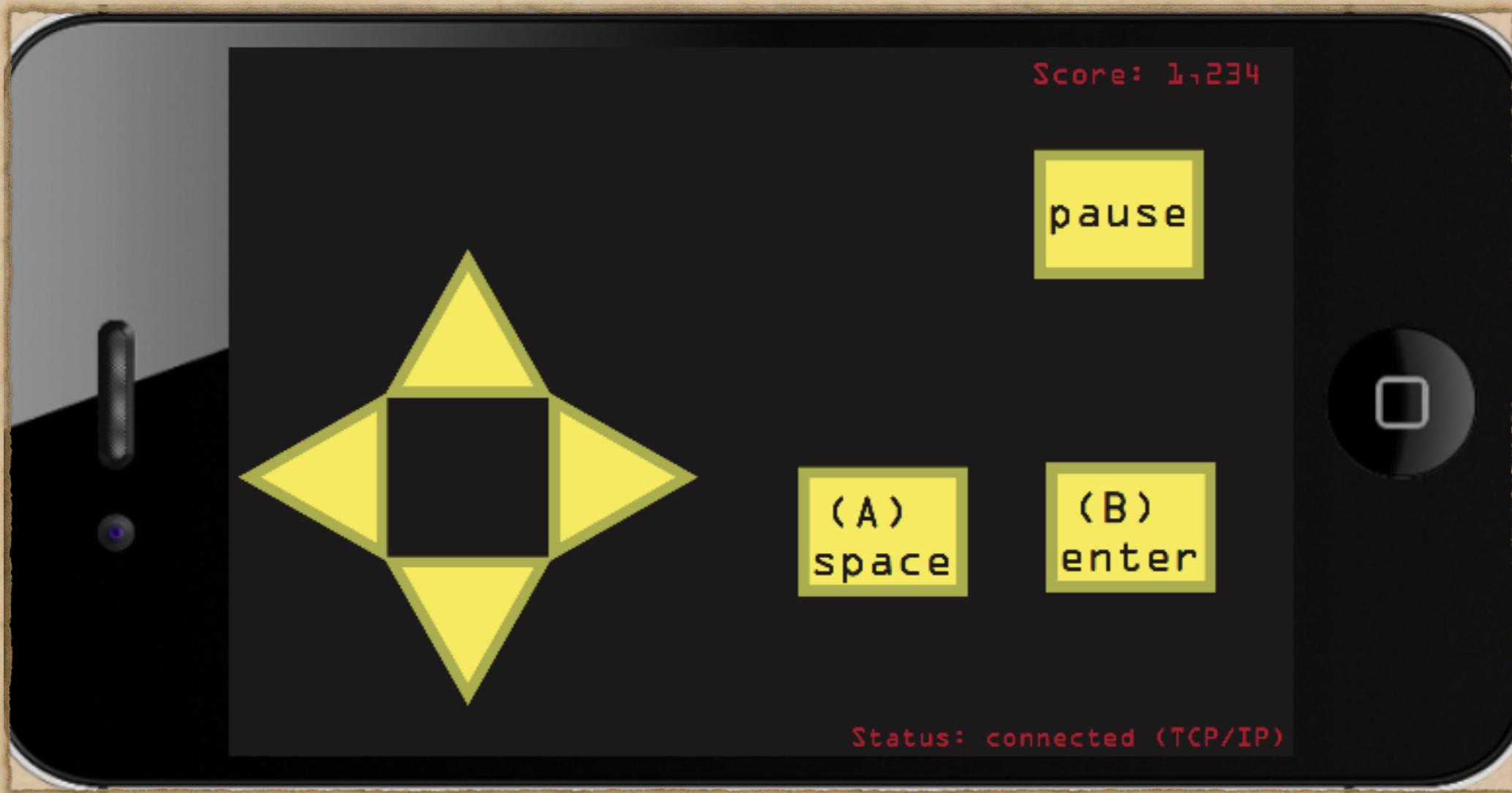




Cloud Architecture for mobile Resources







Adapt Control

Have a custom controller that adapts to the user input.

Neurofeedback games

Use the brainwaves as a input
for games.



Jecripe

A game to teach children with
Down syndrome.





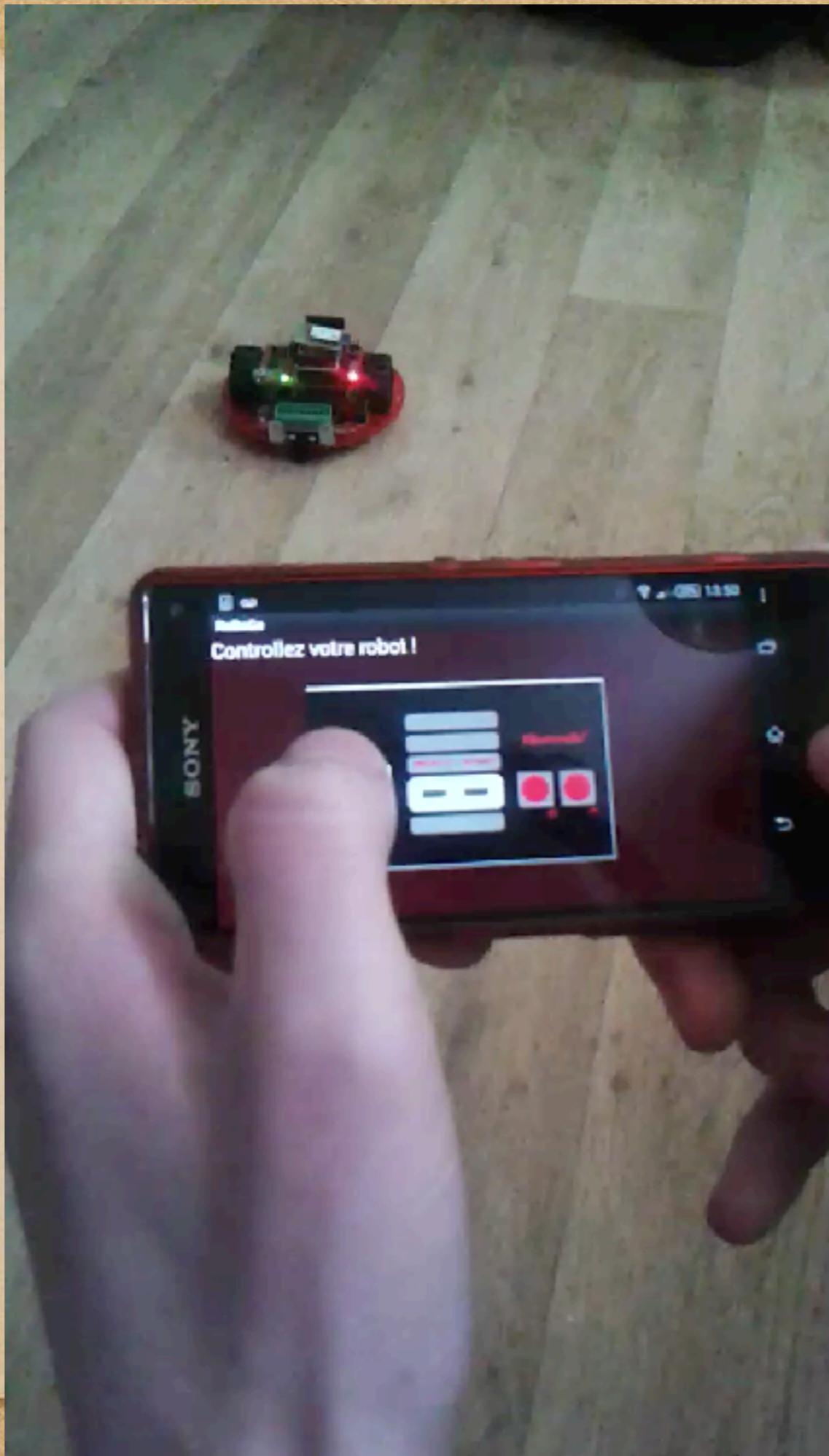
Carnaval Machine

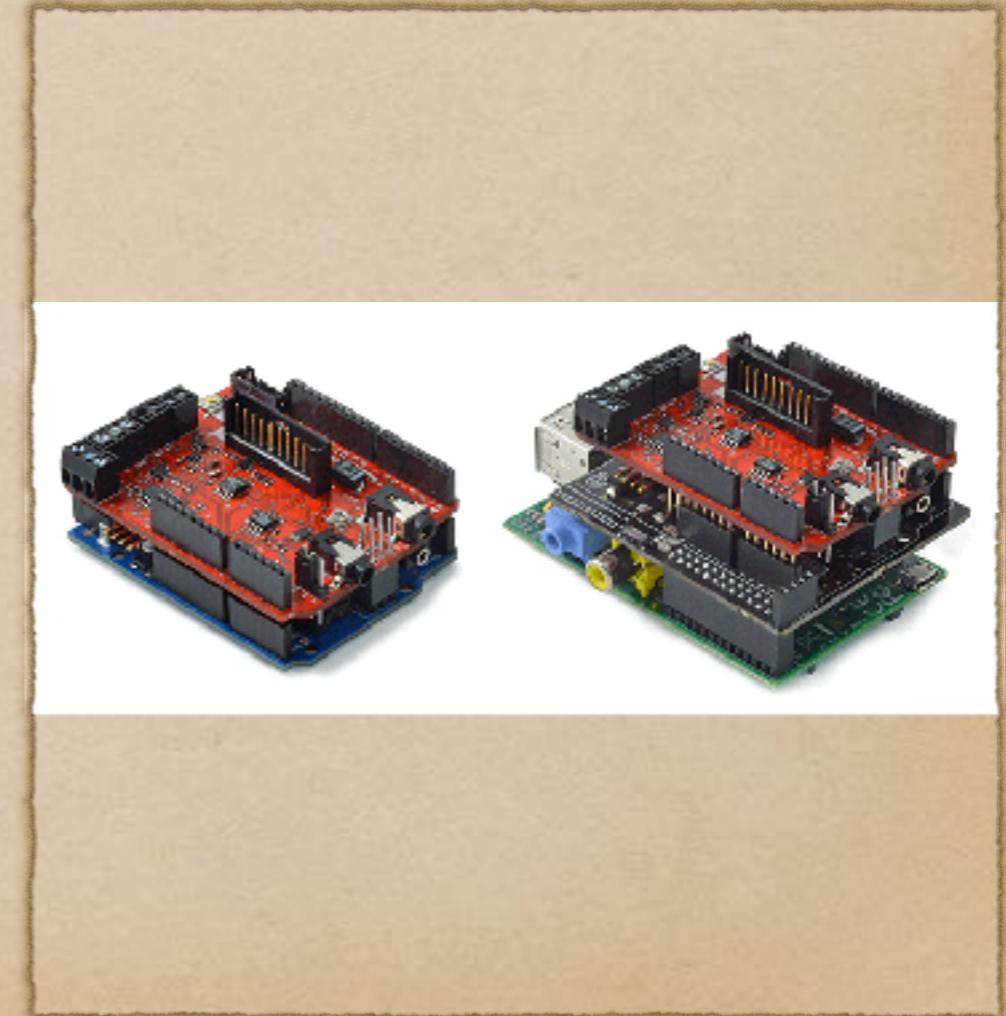
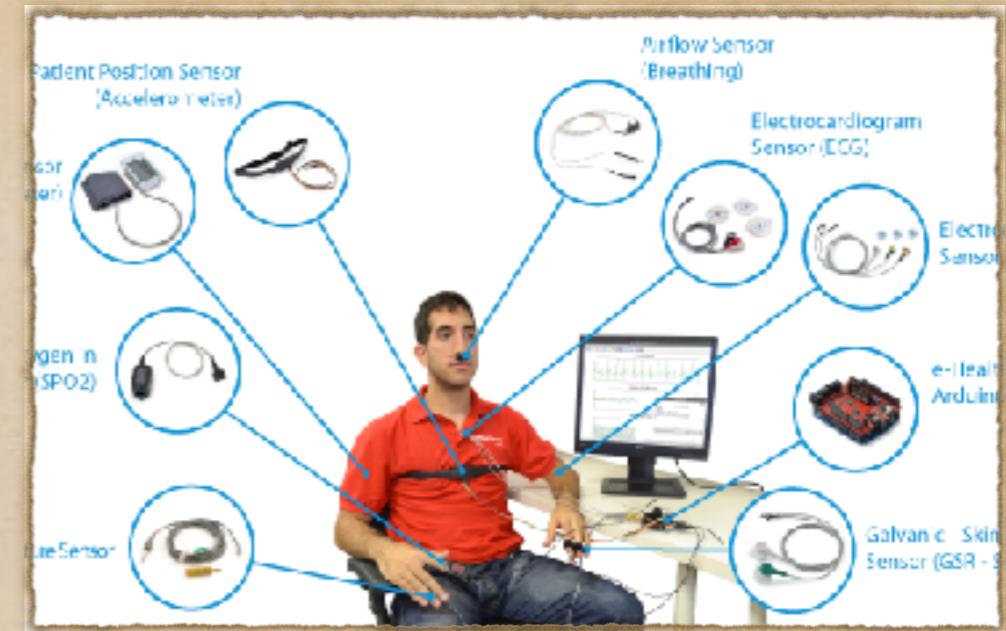
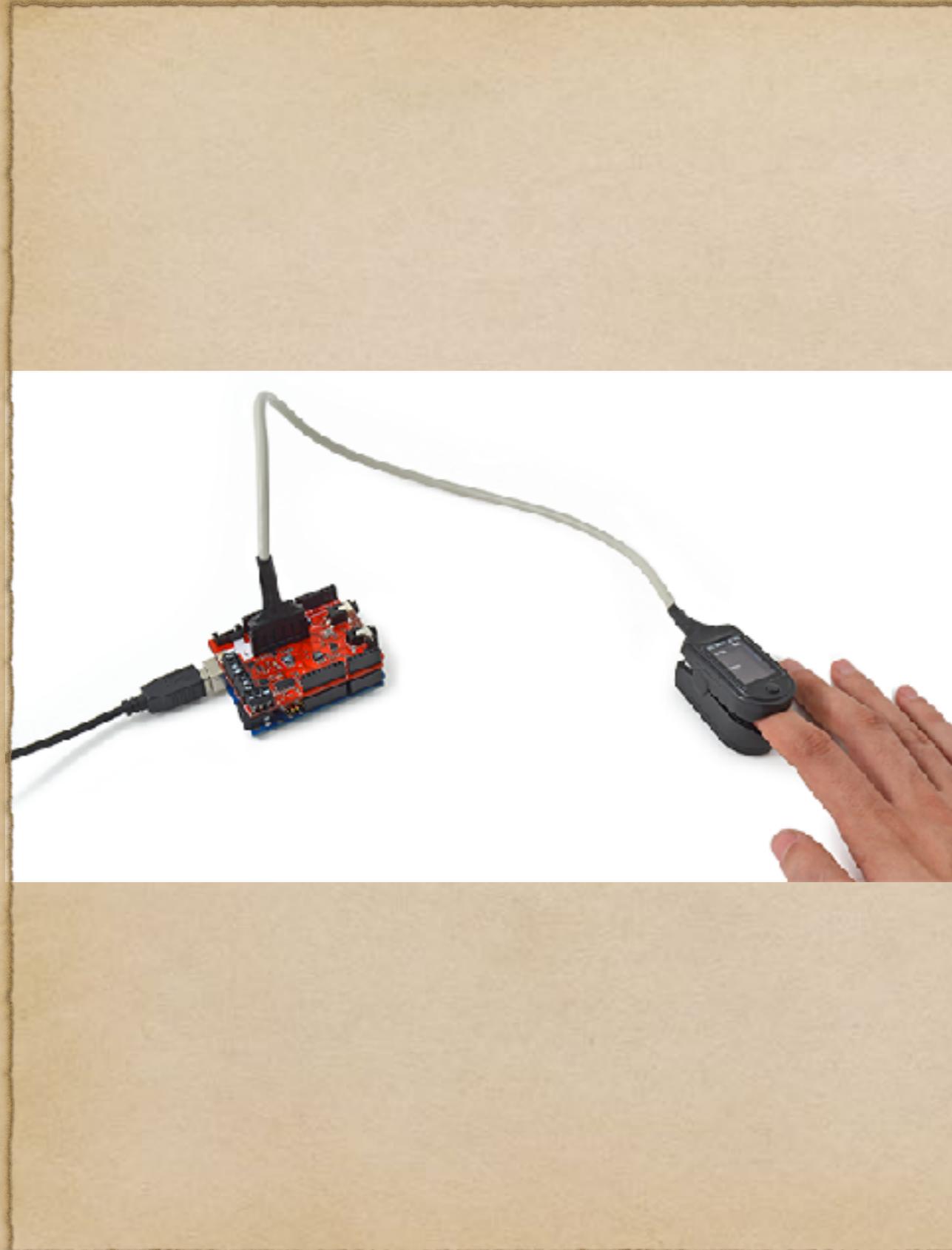
A game to present to the world the culture and world
of the Carnaval.

What do I teach in
ESIGELEC?

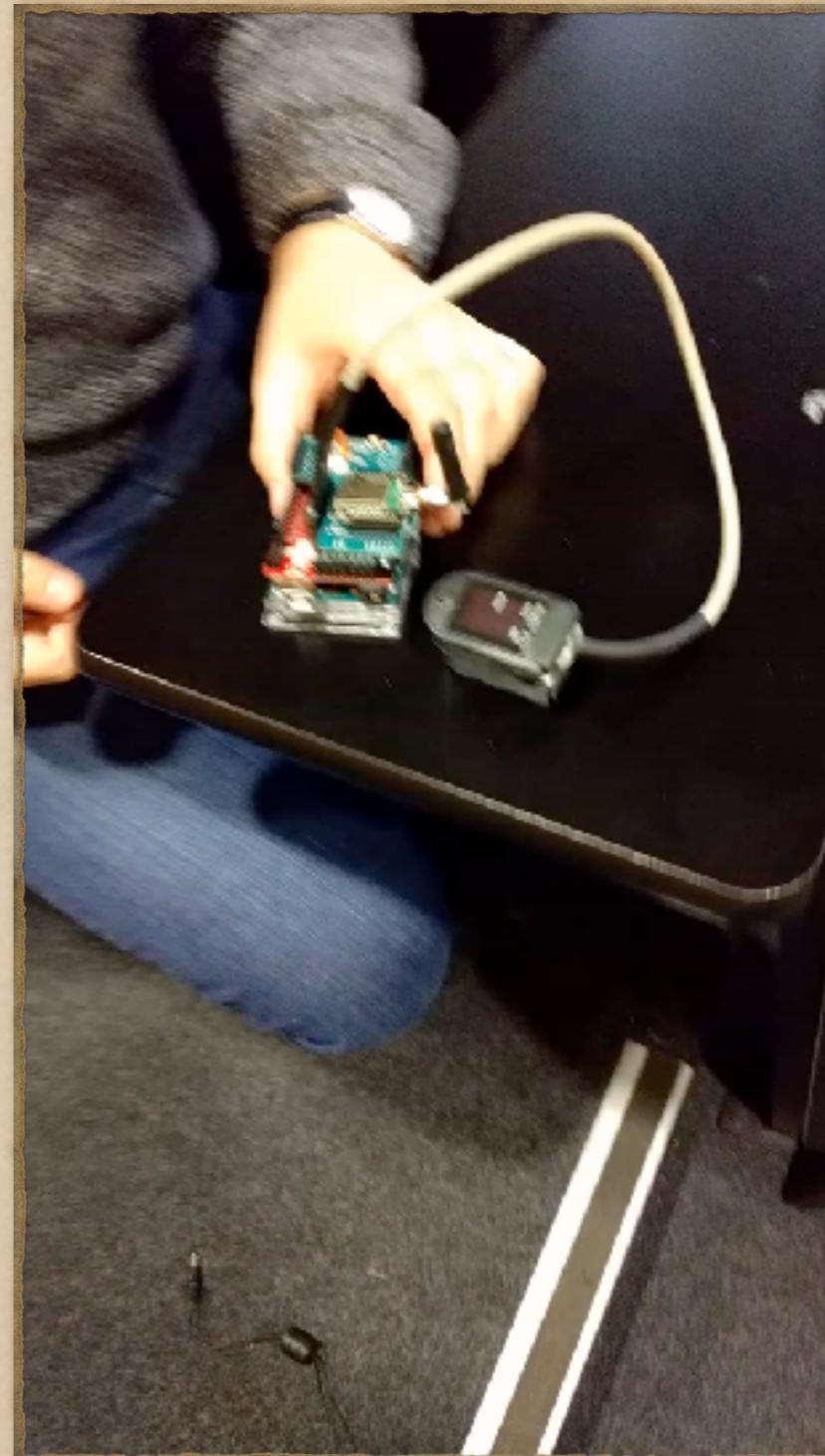
Android

- ◆ I teach mobile development using Android;
- ◆ The goal is that after the course the student is able to develop Apps;
- ◆ I teach in two courses:
 - ◆ Android and Innovation - where the students build an App to control a robot
 - ◆ Android for Health Care and Well-being - where students build an health App using extra sensors;





Project with Oximeter



Schedule - Android Apps

- ◆ 15/02/2024 - 08:30~12:30 - Introduction to Android
- ◆ 19/02/2024 - 08:30~12:30 - Hello Android
- ◆ 20/02/2024 - 13:30~17:30 - Intents and Dynamic Binding
- ◆ 21/02/2024 - 08:30~12:30 - RecyclerView
- ◆ 22/02/2024 - 08:30~12:30 - project

Grades

- ◆ One small app (20%)
- ◆ One final project App (80%)



An introduction to Android.

Introduction to Android

- ◆ “Android is a software stack for mobile devices that includes an operating system, middleware and key applications.”
- ◆ “The Android SDK provides the tools and APIs necessary to begin developing applications on the Android platform using the Java programming language.”
- ◆ Stated goal: “accelerate innovation in mobile and offer consumers a richer, less expensive, and better mobile experience.”



Our goal is not just a single device. Our vision is a mobile platform that runs on many many different devices.

– Eric Schmidt

Visión

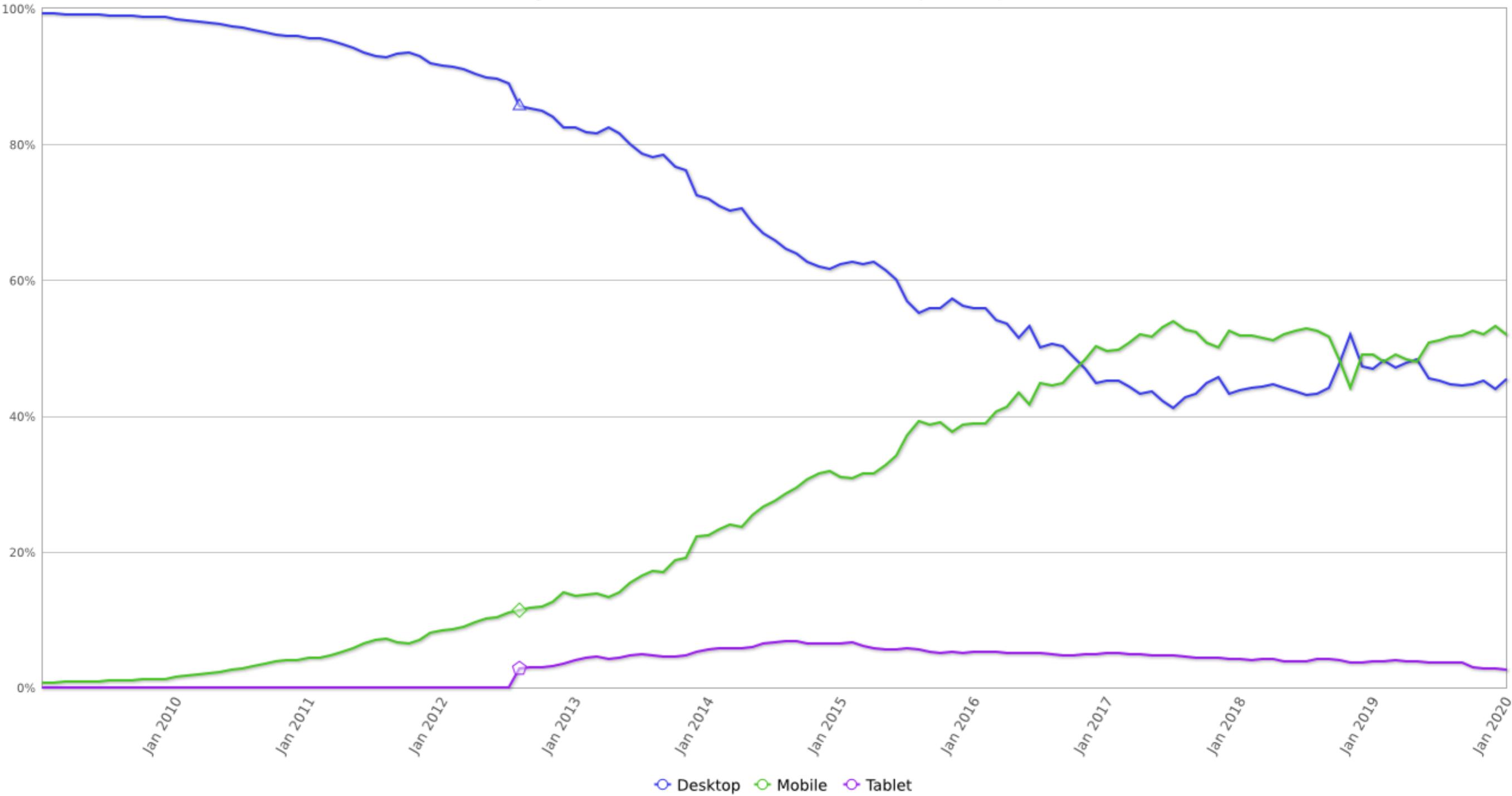
Android: Pros and Cons

- ◆ Many different Android devices, more being developed all the time;
- ◆ Backed by Google, one of the world's biggest and most powerful IT companies;
- ◆ Google is deliberately “disruptive”;
- ◆ Free development environment for low cost of entry;
- ◆ Free OS for hardware developers;

Android: Pros and Cons

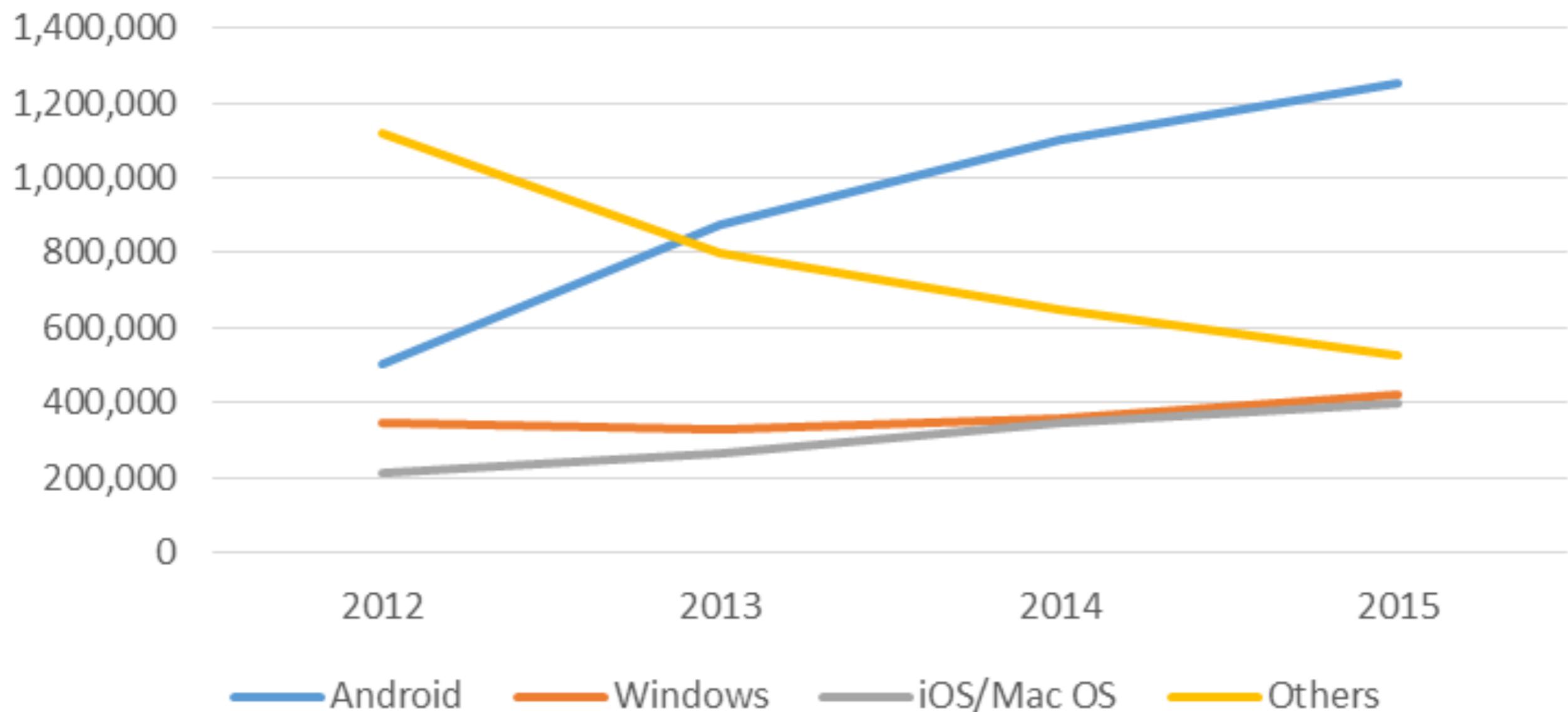
- ◆ Although Android can be used on many types of devices, they are not always supported by Google;
- ◆ Devices must support quite a rich mix of capabilities in order to be certified as Android compatible;
- ◆ Only “compatible” devices have access* to Google Play (the Android Market);

StatCounter Global Stats
Desktop vs Mobile vs Tablet Market Share Worldwide from Jan 2009 - Jan 2020



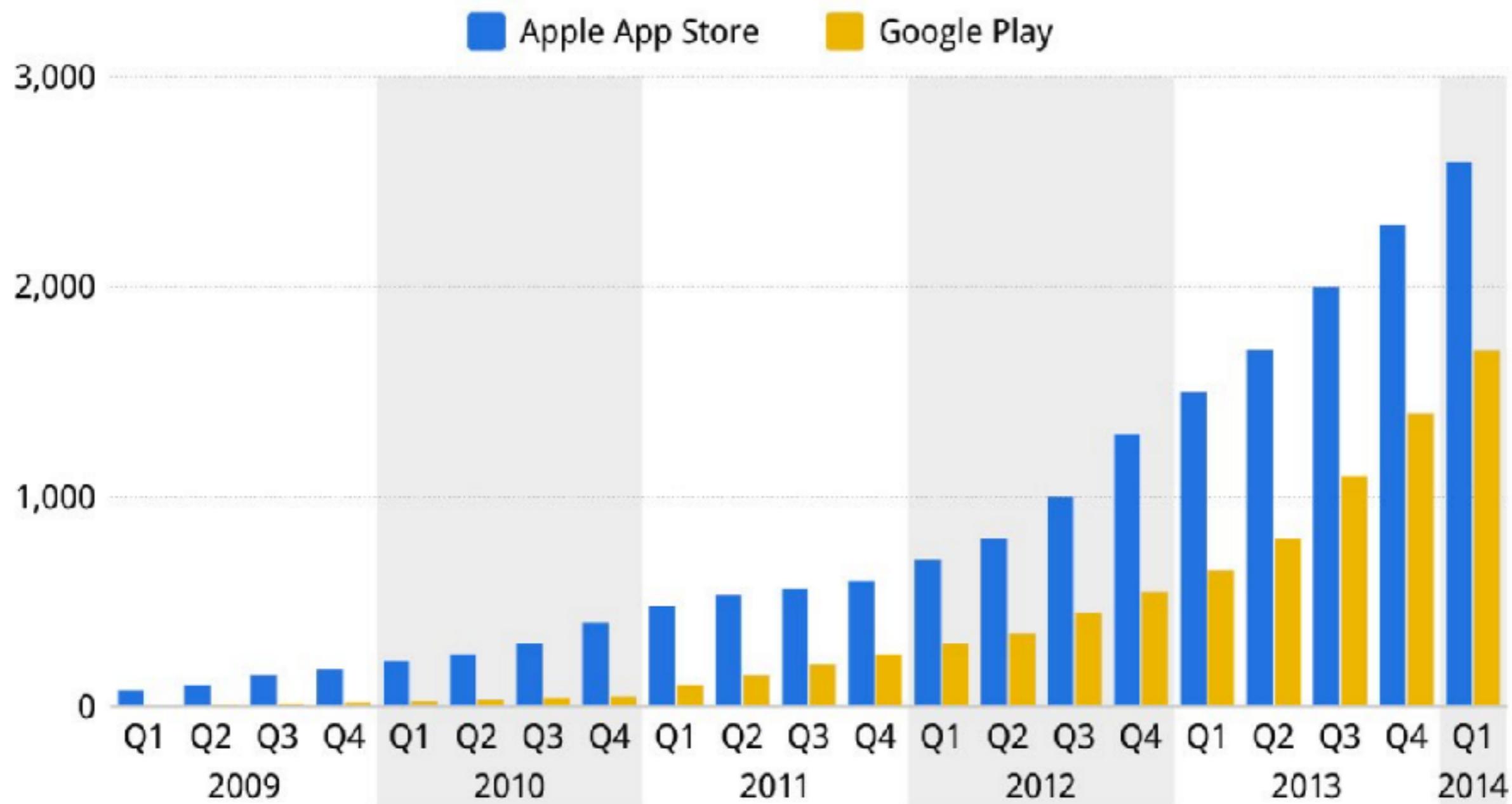
Android vs. iOS

Worldwide Device Shipments by Operating System (Thousands of Units)



How Much Apple And Google Pay Out To App Developers

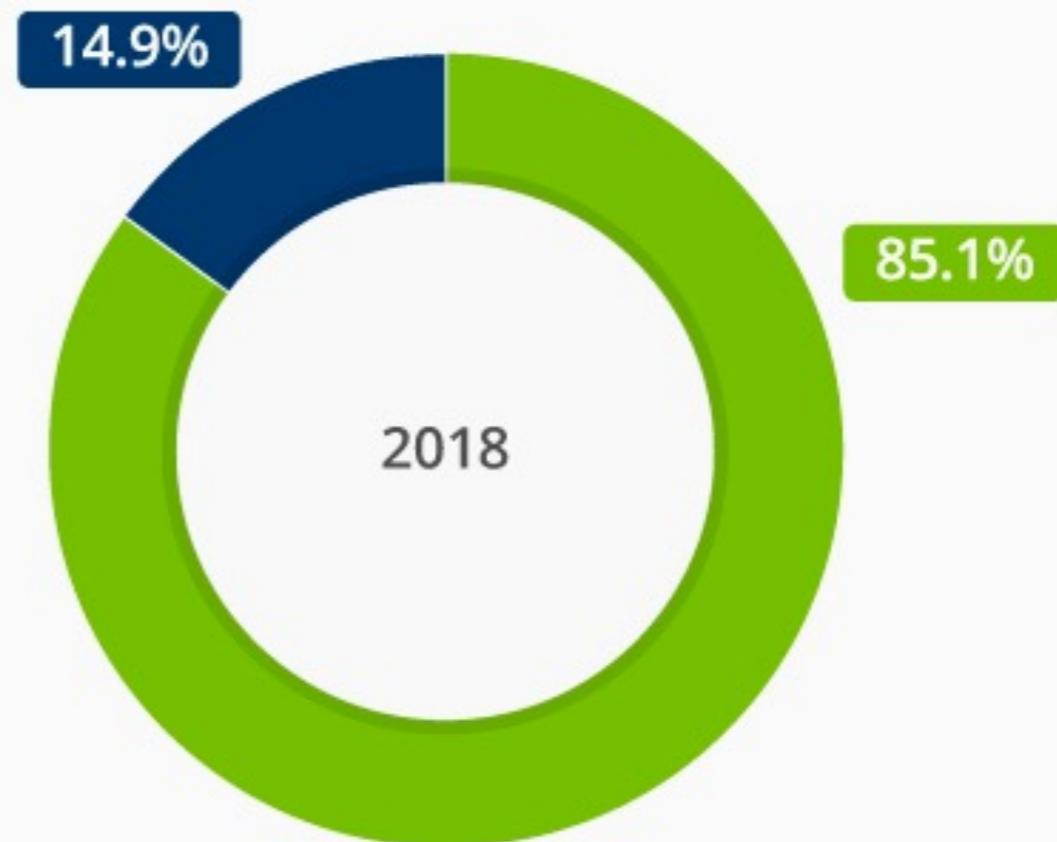
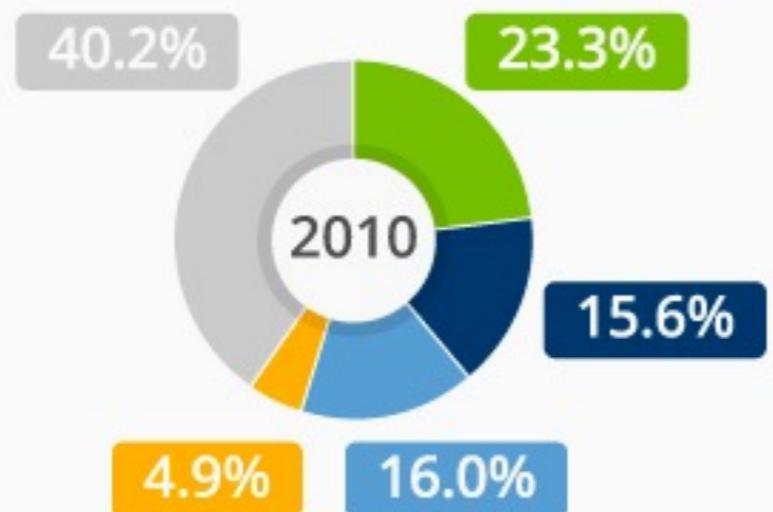
Quarterly payments to app developers made by Apple and Google (in million U.S. dollars)



The Smartphone Duopoly

Worldwide smartphone market share by operating system (based on unit shipments)

● Android ● iOS ● BlackBerry ● Windows Phone ● Others



Total sales

305m

1,405m

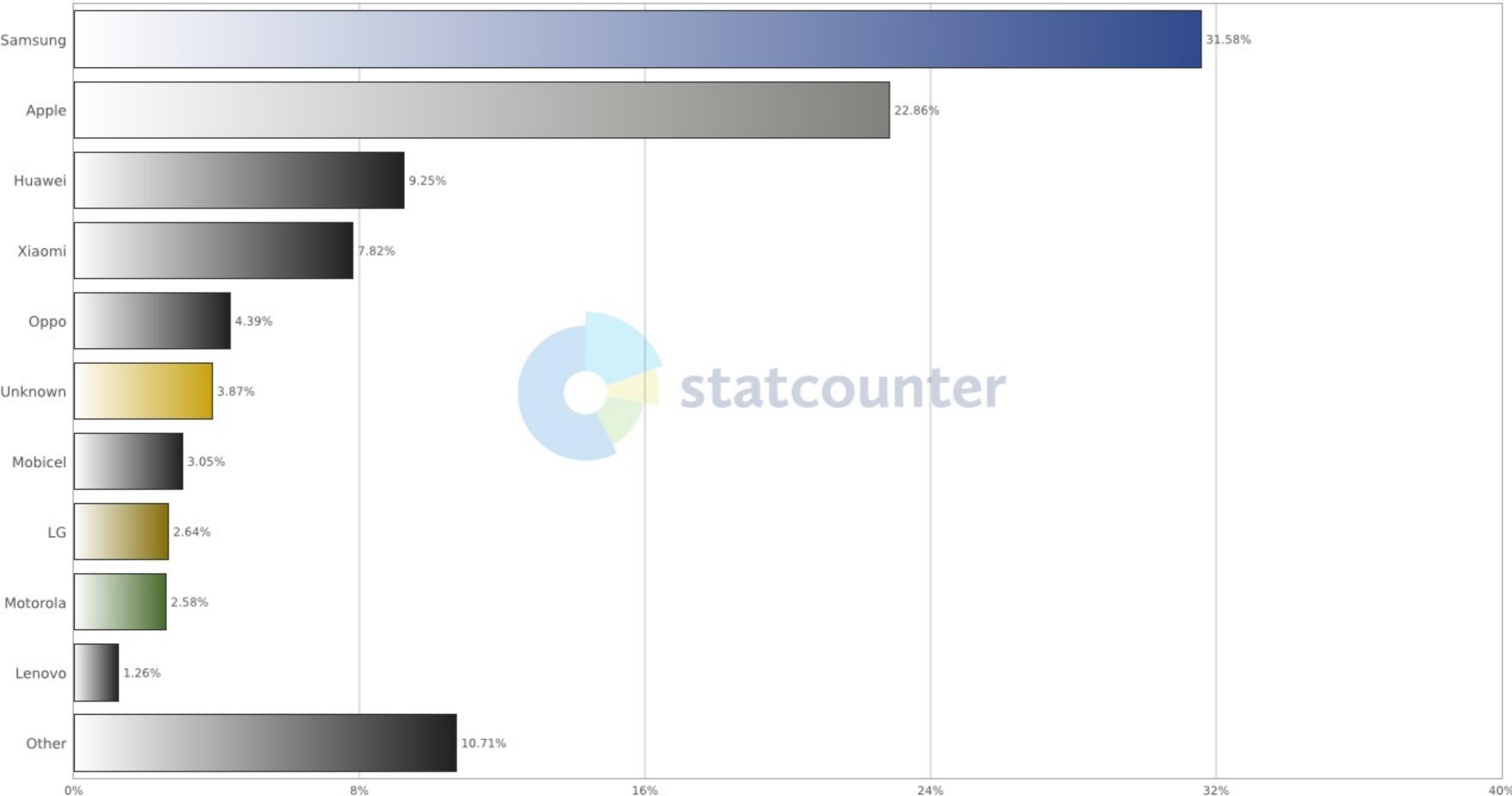


@StatistaCharts

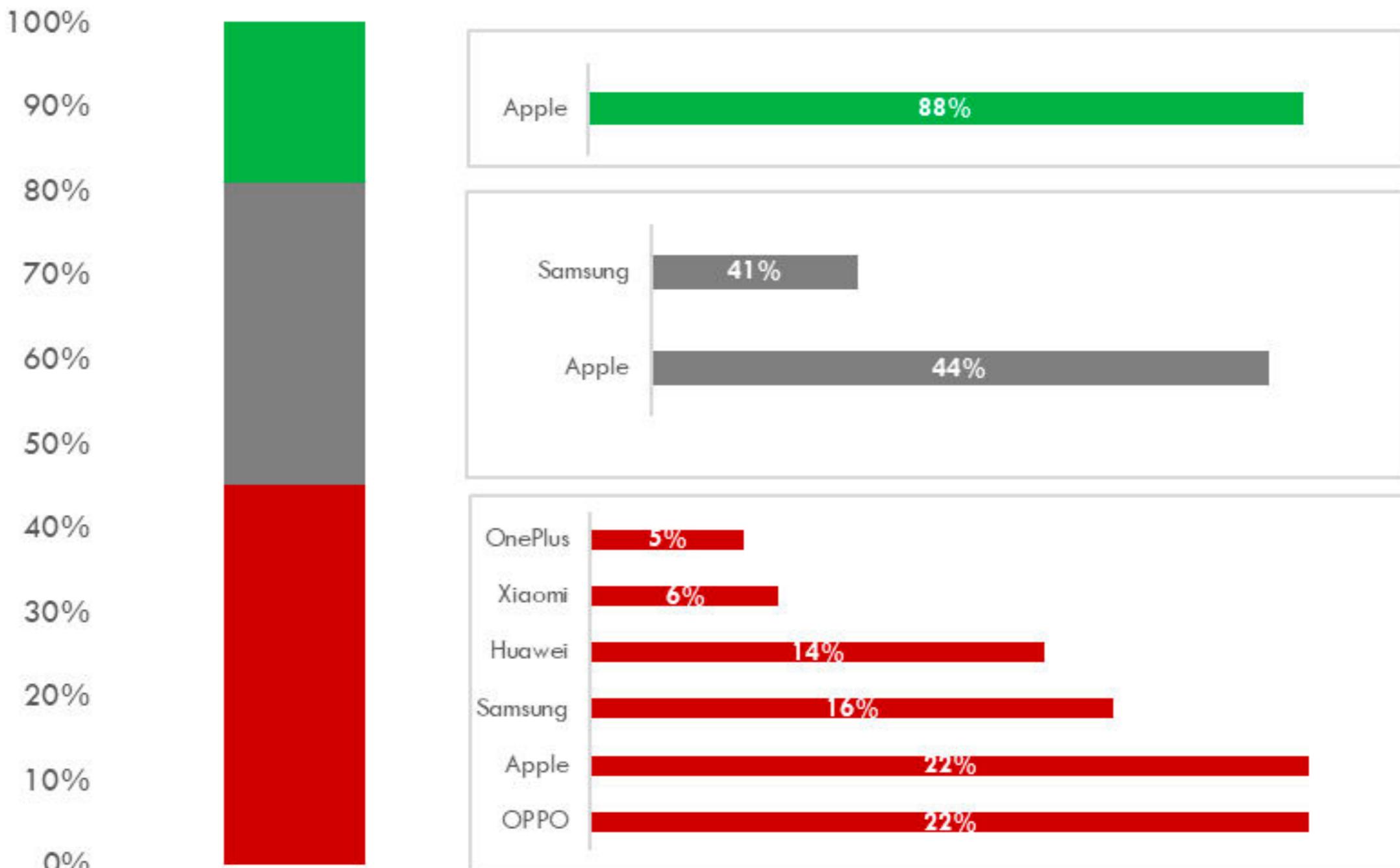
Source: IDC

statista

StatCounter Global Stats
Mobile Vendor Market Share Worldwide from Jan 2019 - Jan 2020

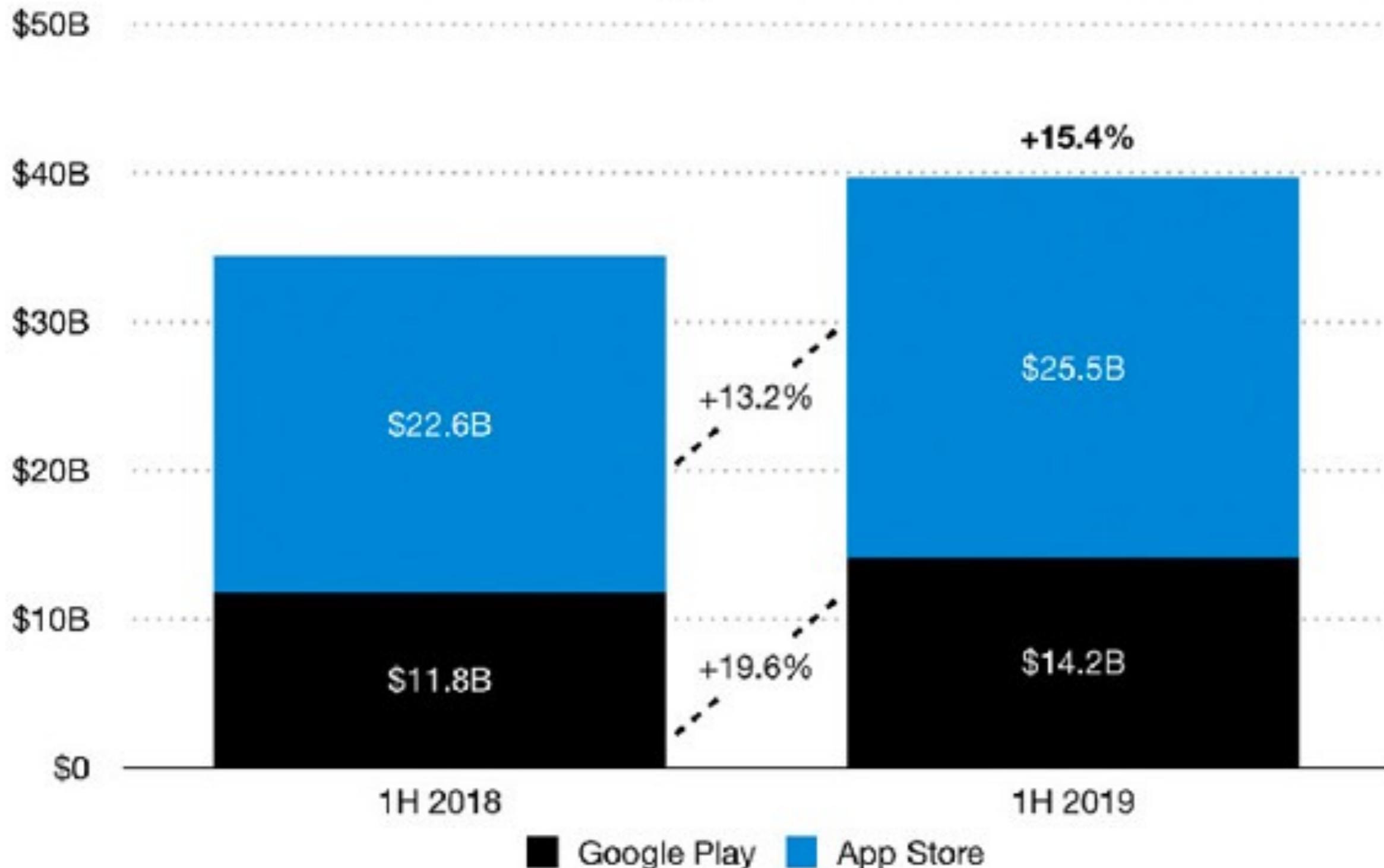


Premium Smartphone Segment Price Tier Split and OEM Share



■ 400~600 ■ 600~800 ■ >\$800

Worldwide Gross App Revenue - First Half 2019



SensorTower



SensorTower Data That Drives App Growth

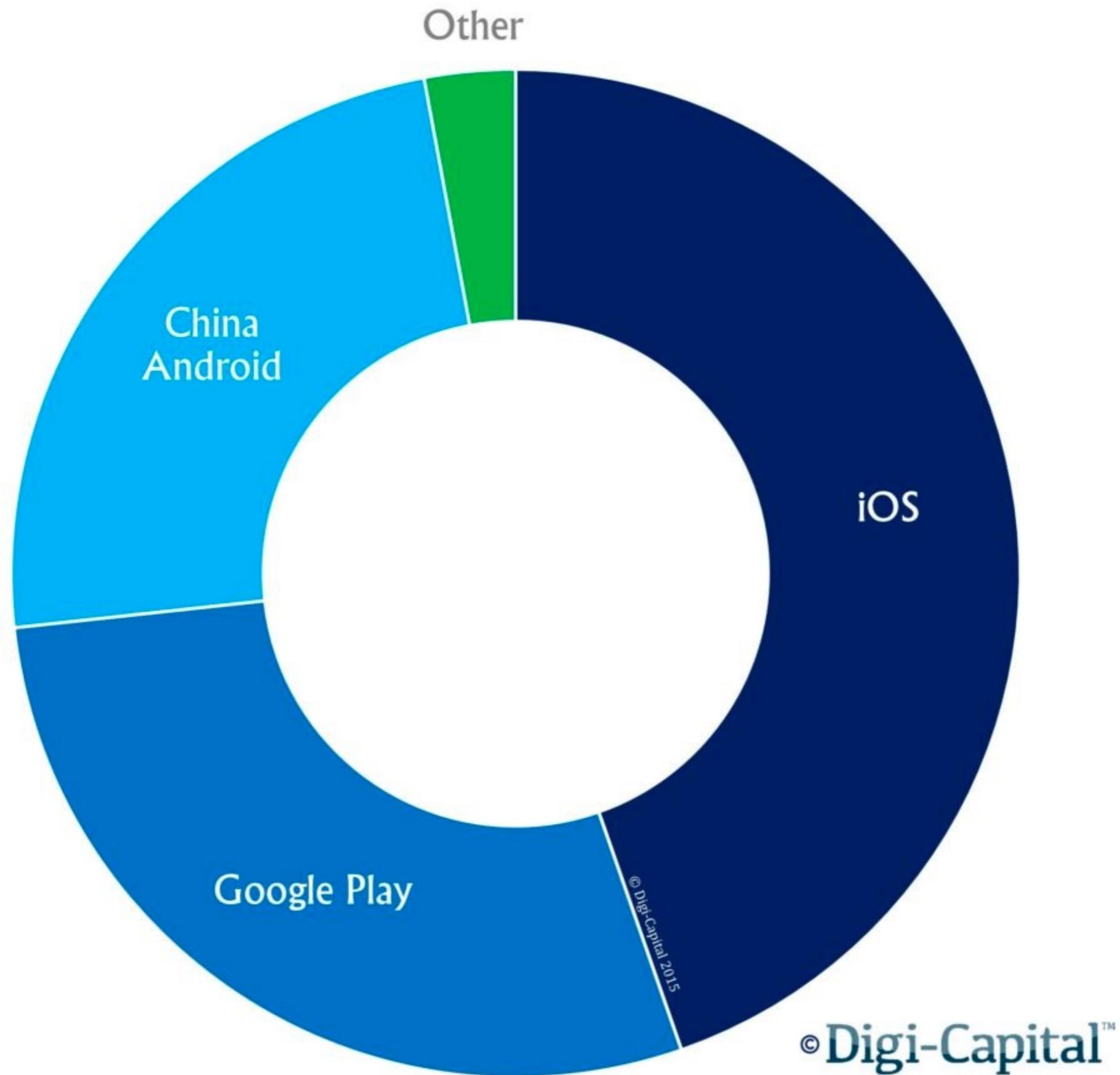
sensortower.com

Worldwide App Downloads and Revenue by Store



Compared to Q1 2016, the downloads gap remained the same, but iOS extended its lead over Google Play in revenue by 10 percentage points.

Global app stores revenue value share 2014



Android: Why develop?

- ◆ Google Play Apps is open to all applications
 - ◆ No screening except for illegal or malware content
 - ◆ No controls on applications which compete with Google
 - ◆ Android explicitly allows new components to replace old ones, even at the OS level
- ◆ The downside is that some apps are very poor quality, check user feedback scores
- ◆ But Google is implementing a review process for publication on the store.

Android: Success

- ◆ Android is tightly regulated by Google at the hardware level
- ◆ But Android is an open system for developers
- ◆ The success of Android has surprised many
- ◆ Much of the success may be down to:
 - ◆ Apple's iPhone, opening a new market sector
 - ◆ Apple and its over-controlling nature
 - ◆ Microsoft's inactivity and ball-dropping
 - ◆ Google's aggressive development



Fragmentation Remains an Issue in the Android Universe

% of iOS/Android devices running the latest versions of iOS/Android

Released in

Earlier versions
7%

iOS

iOS 10
Sep 16
28%

iOS 11
Sep 17

65%

Earlier versions
17%

Lollipop
Nov 14
25%

android

Marshmallow
Oct 15
28%

Oreo
Aug 17
1%

Nougat
Aug 16
29%

Data collected by the App Store
on January 18, 2018

Data collected during a 7-day period ending
on February 5, 2018



@StatistaCharts

Sources: Apple, Google

statista



Android Garden

List of Android Versions and Initial Stable Release Dates



Android 1.0
September 23, 2008



1.5 - Cupcake
April 27, 2009



1.6 - Donut
September 15, 2009



2.0/2.1 - Éclair
October 26, 2009



2.2 - Froyo
May 20, 2010



2.3 - Gingerbread
December 6, 2010



3.0 - Honeycomb
February 22, 2011



4.0 - Ice Cream Sandwich
October 18, 2011



4.1/4.3 - Jelly Bean
July 9, 2012



4.4 - KitKat
October 31, 2013



5.0 - Lollipop
November 12, 2014



6.0 - Marshmallow
October 5, 2015



7.0 - Nougat
August 22, 2016



8.0 - Oreo
August 21, 2017



9.0 - Pie
August 6, 2018



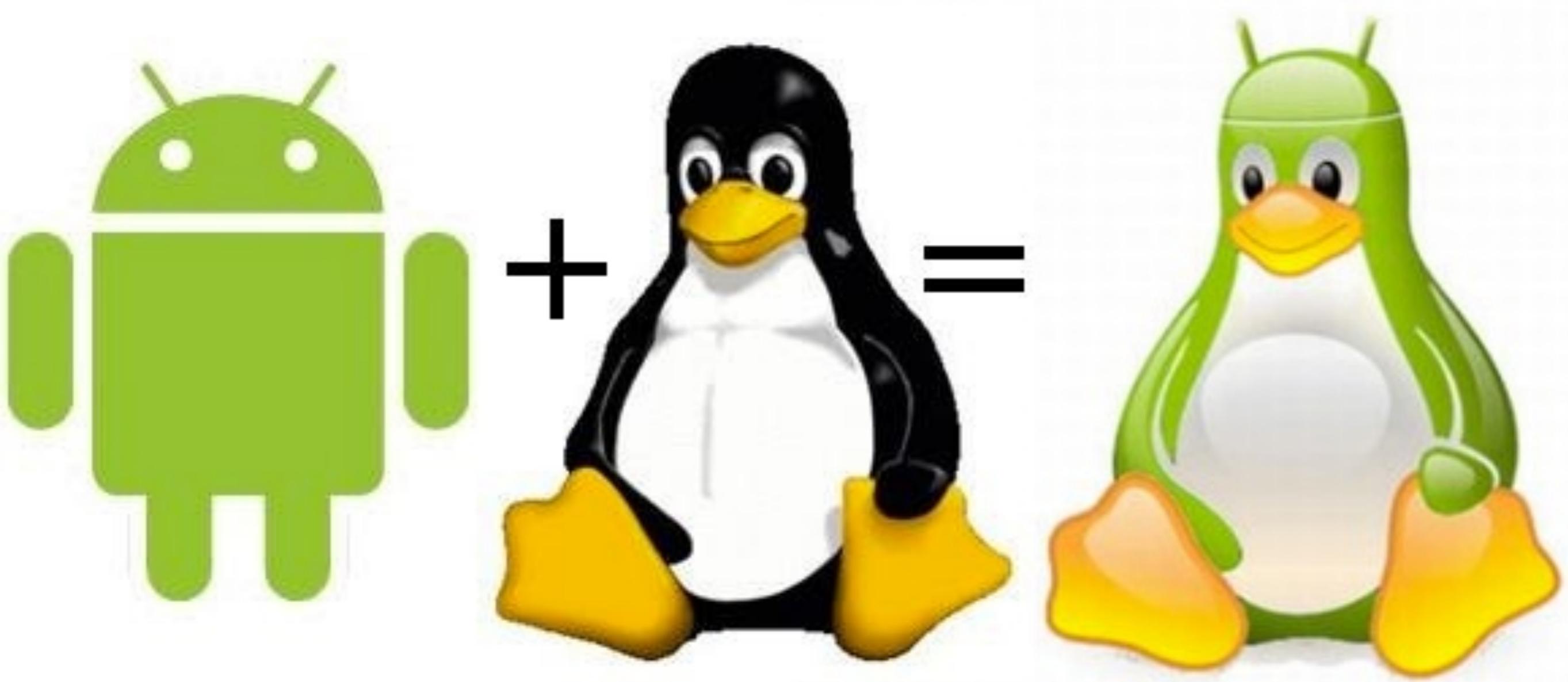
Android 10
September 3, 2019



Android 11
September 8, 2020



Android 12
October 17, 2021

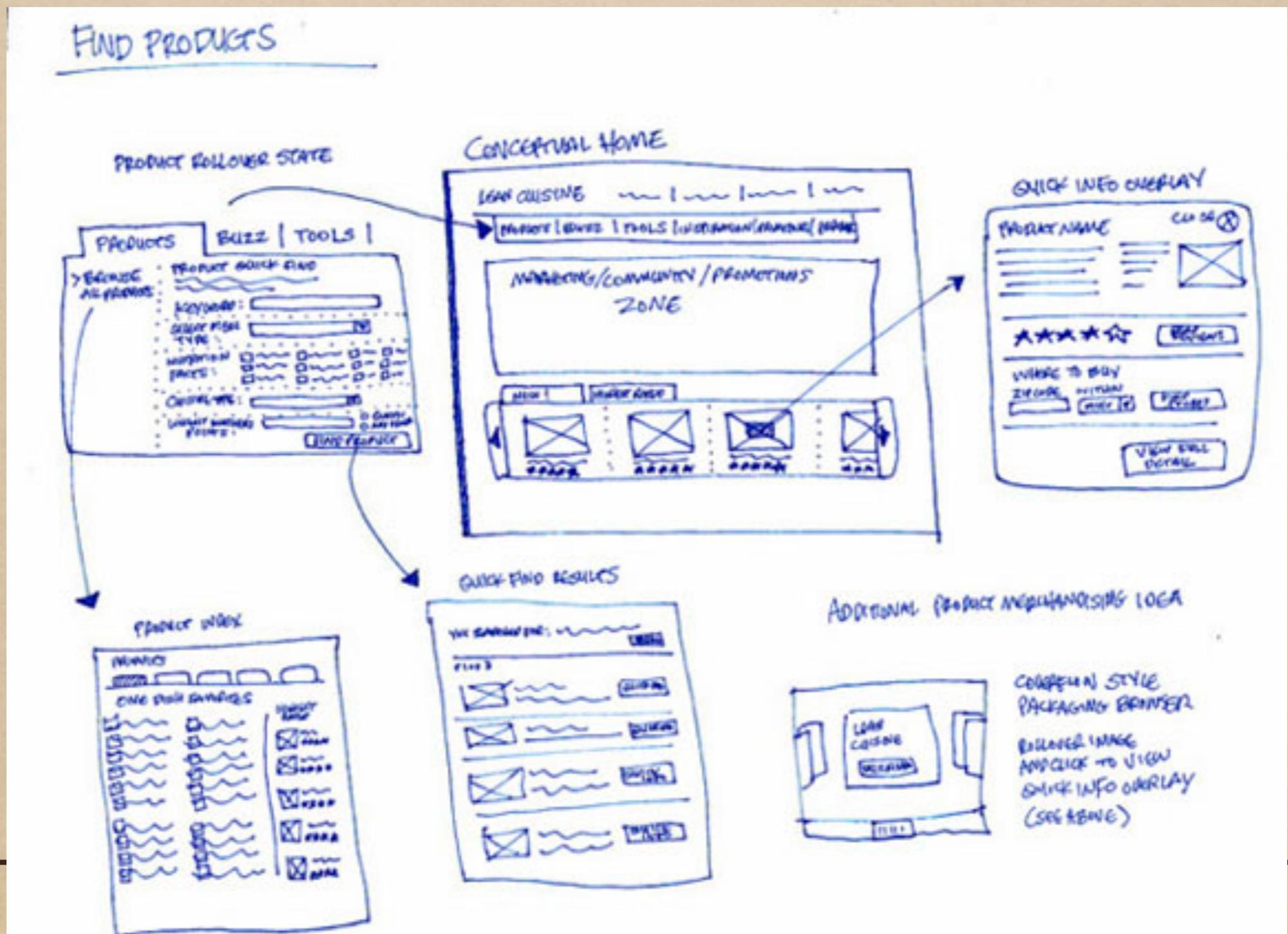


Design

Prototyping?

- ◆ It is a simplification of the information.
 - ◆ Prototype can mean -> to build
 - ◆ wireframe || mockup || prototype
-

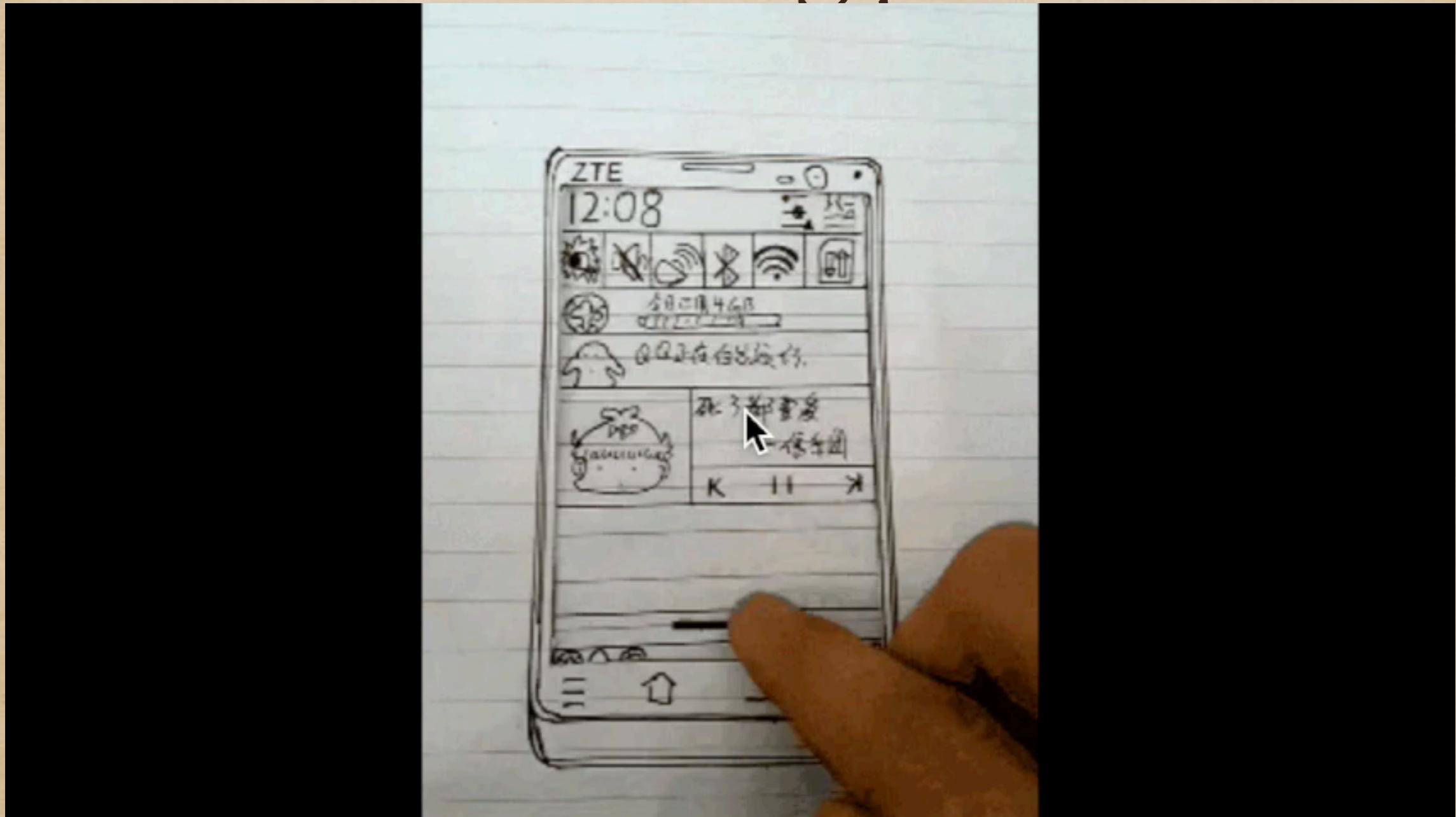
Wireframe



Mockup



Prototype



Android Architecture

APPLICATIONS

Home

Contacts

Phone

Browser

...

APPLICATION FRAMEWORK

Activity Manager

Window Manager

Content Providers

View System

Package Manager

Telephony Manager

Resource Manager

Location Manager

Notification Manager

LIBRARIES

Surface Manager

Media Framework

SQLite

OpenGL | ES

FreeType

WebKit

SGL

SSL

libc

ANDROID RUNTIME

Core Libraries

Dalvik Virtual Machine

ART

LINUX KERNEL

Display Driver

Camera Driver

Flash Memory Driver

Binder (IPC) Driver

Keypad Driver

WiFi Driver

Audio Drivers

Power Management

The life of an APK

