Mobile computing

starting in 5:00

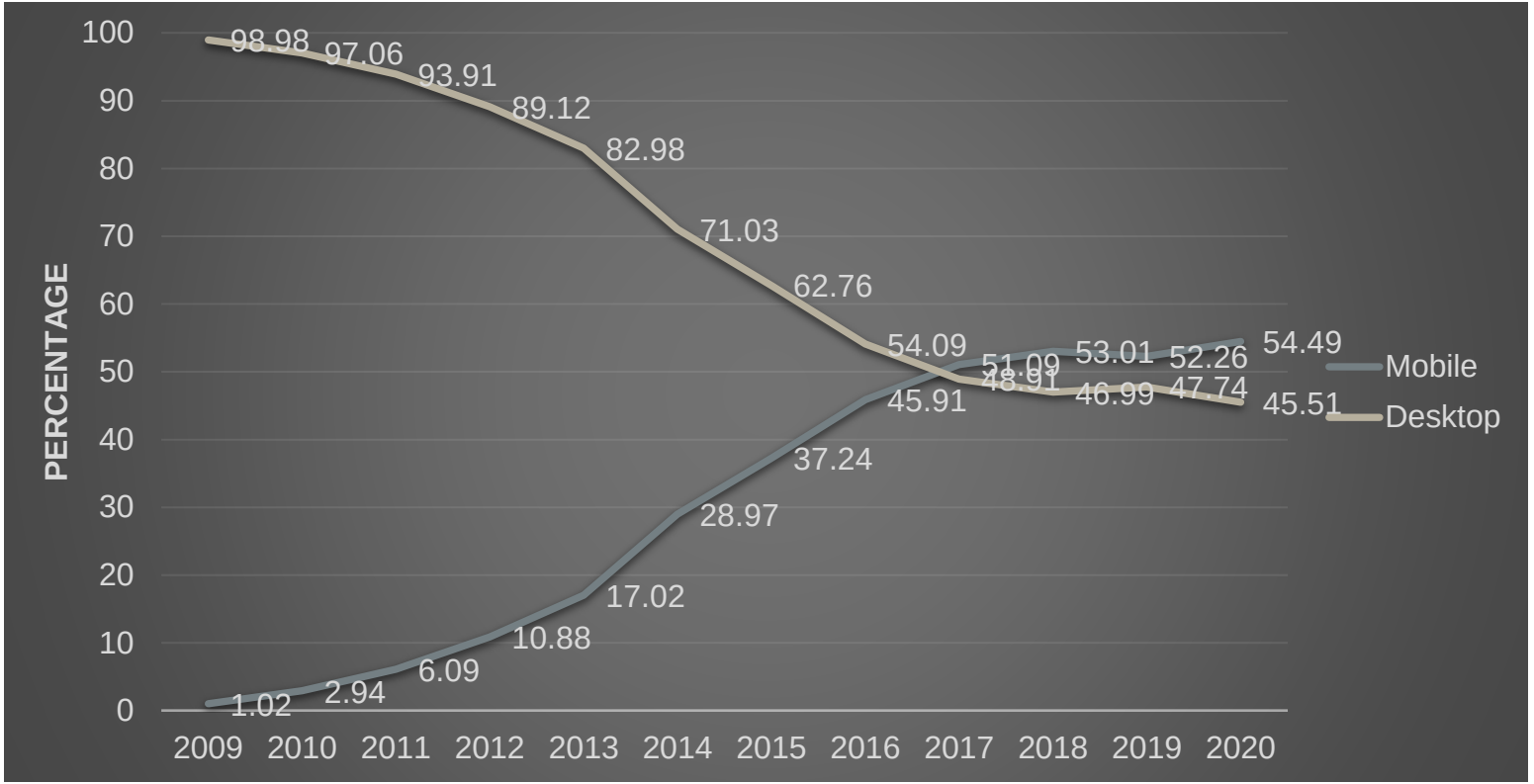
Dr. Goran Soldar
Dr. Khuong An Nguyen

St. Peter’s Square (Vatican city)

2005 Election of Pope Benedict

2013 Election of Pope Francis

Mobile vs Desktop



Internet usage worldwide

(Statcounter.com)

Mobile development jobs

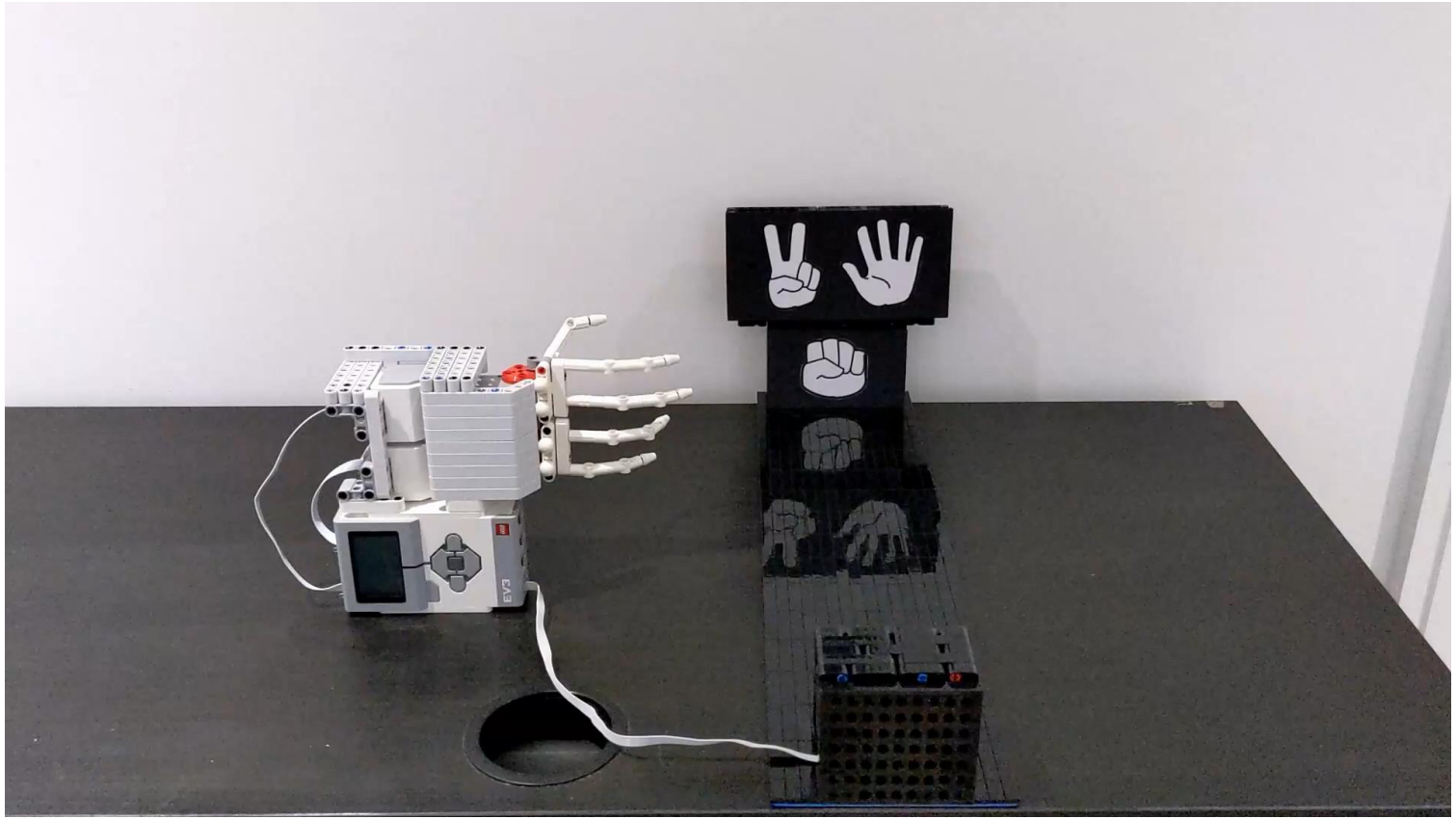
Skill / Job Role (Historical trends & salary statistics)	Median Salary 6 Months to 21 Dec 2020	Median Salary % Change Year-on-Year	Historical Permanent Job Ads	Live Job Vacancies
Mobile App	£55,000	+10.00%	1,838 (3.10%)	**399**
Ionic Mobile App Framework	£52,500	+10.52%	71 (0.12%)	**19**
Mobile App Development	£55,000	+10.00%	264 (0.44%)	**62**
Mobile First	£55,000	-	108 (0.18%)	**35**
Mobile Games	£55,000	-4.34%	97 (0.16%)	**29**

(www.itjobswatch.co.uk)

CI560: Mobile app development (Jarod, Marcus, Khuong)

CI660: Advanced mobile app development (Khuong)

Rock Paper Scissors robot



designed and programmed by Dr. Khuong An Nguyen, 2020

What

Why

How

1 What is mobile computing ?

2 Why has it become so popular ?

3 How to design an effective mobile computing system ?

Mobile computing

What

Why

How

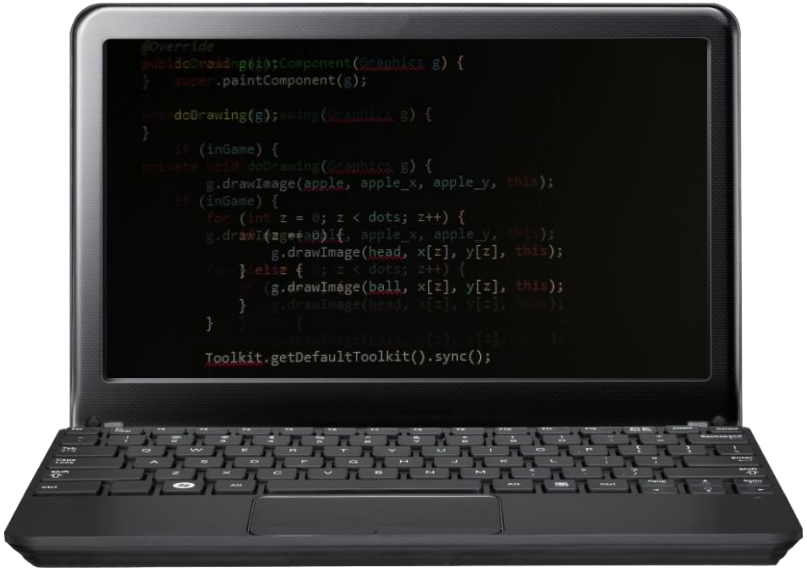
The technology that enable people to do their work anytime, anywhere.

What

Why

How

Is laptop a mobile device ?



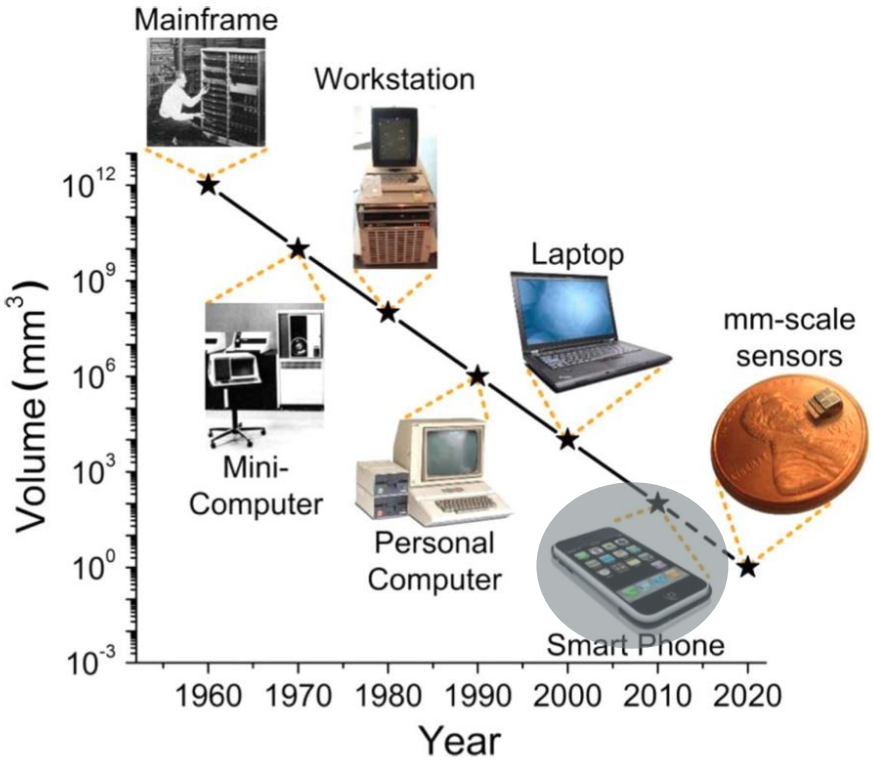
Nomadic computing

What

Why

How

Bell's law



"Every decade, a new lower priced computer class forms resulting in new usage and the establishment of a new industry"

— ***Gordon Bell, 1972***

What

Why

How

Mobile device structure

1. Handheld, portable device.
2. Computer-like.
3. Full sensing capability.

What

Why

How

Human nature

1

Mobility

Our body is not designed to sit in front of a computer.

2

Interaction

We are born to interact with others.

What

Why

How

Evolution of mobile phone

What

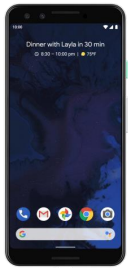
Why

How

Mobile computing challenges

1 Small Screen

2 Touch interaction

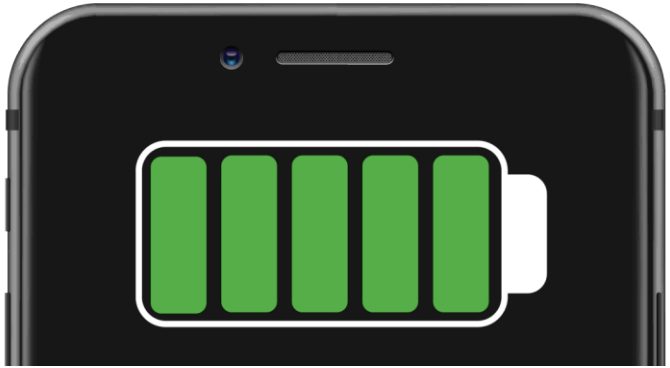


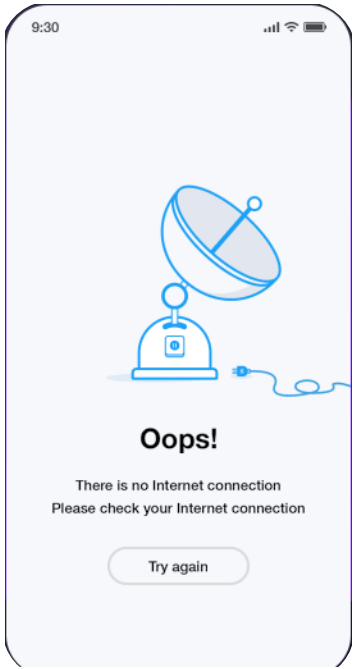
Mobile computing challenges

3 Limited computing power

4 Small memory

5 Intermittent connectivity





What

Why

How

Context

Input Input Input

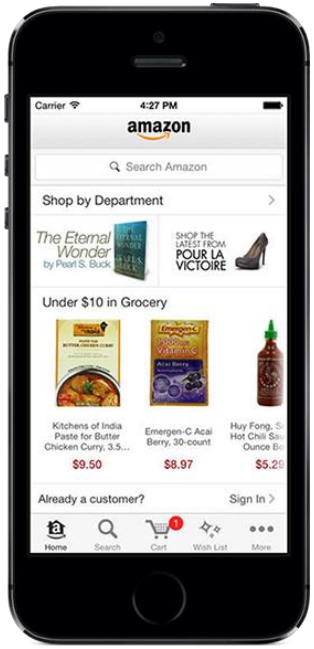
Input Context Input

What

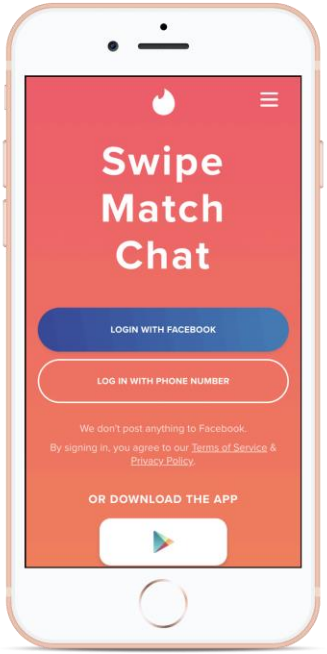
Why

How

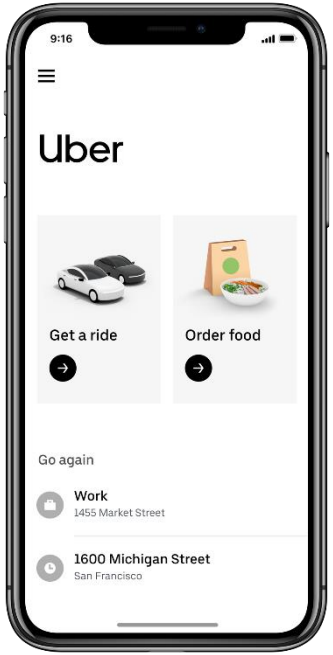
Mobile apps



Amazon



Tinder



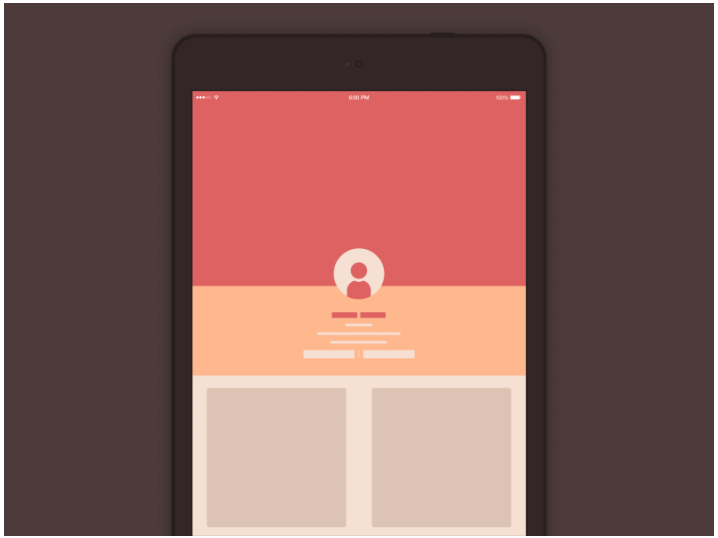
Uber

What

Why

How

Context awareness



Portrait to Landscape

GPS location

The idea that computers can both sense and react based on the device's environment and the user's situation.

What

Why

How

Why context awareness ?

1

Reducing distraction

User’s attention is a scarce resource.

2

User experience

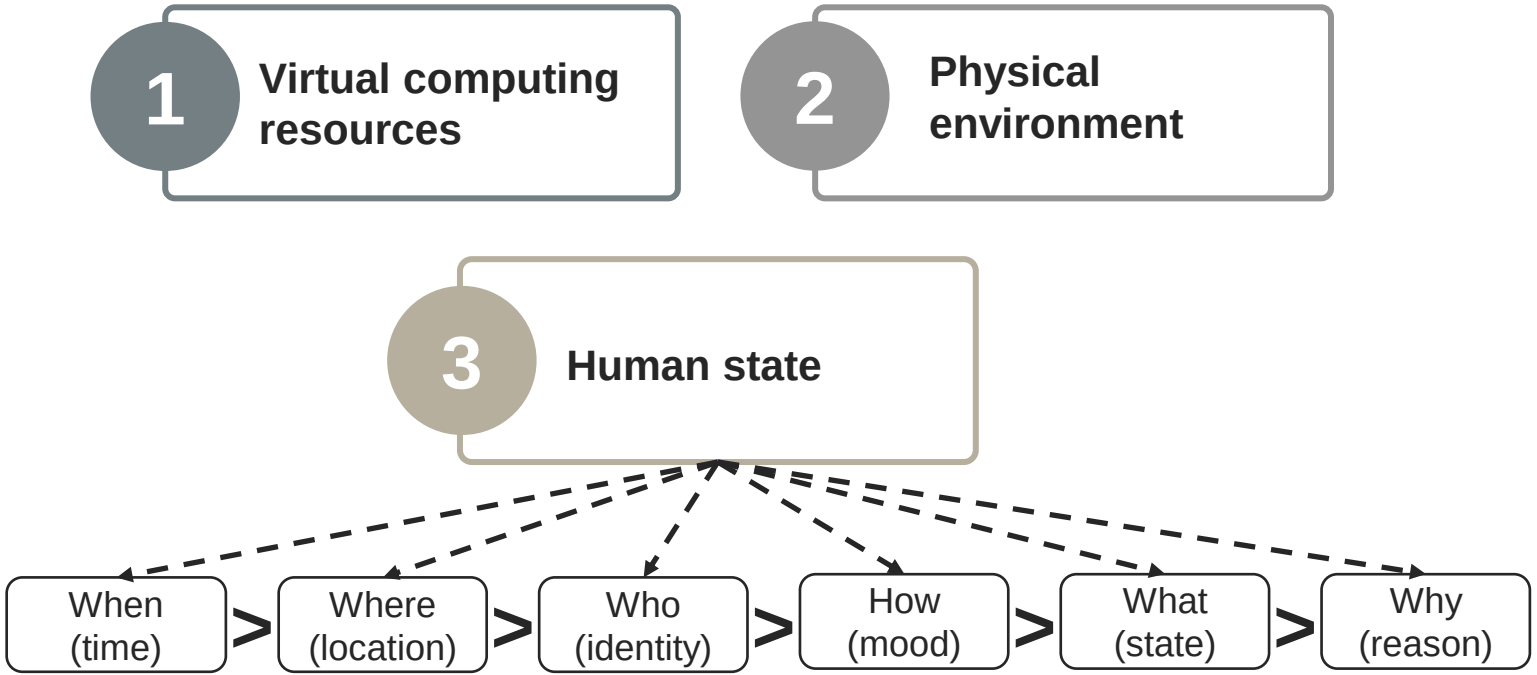
Better user experience through more sensors.

What

Why

How

Mobile context components



Context = human + physical environment + computing resources

What

Why

How

Obtaining contexts

1. Personalisation
2. Passive awareness
3. Active awareness

What

Why

How

Context (personalisation)

Kindle app

Search

Learn more ▶

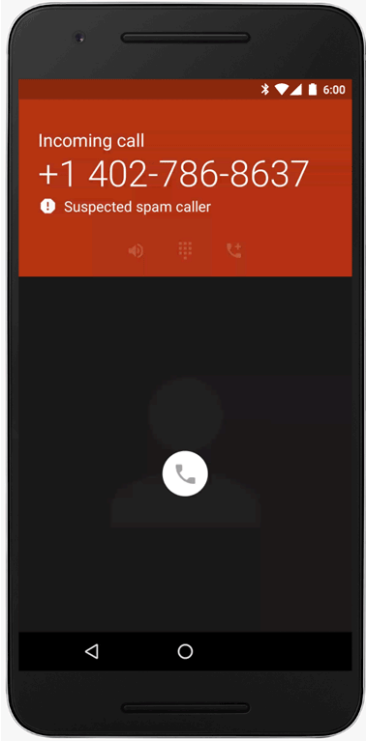
The user explicitly indicates what they want.

What

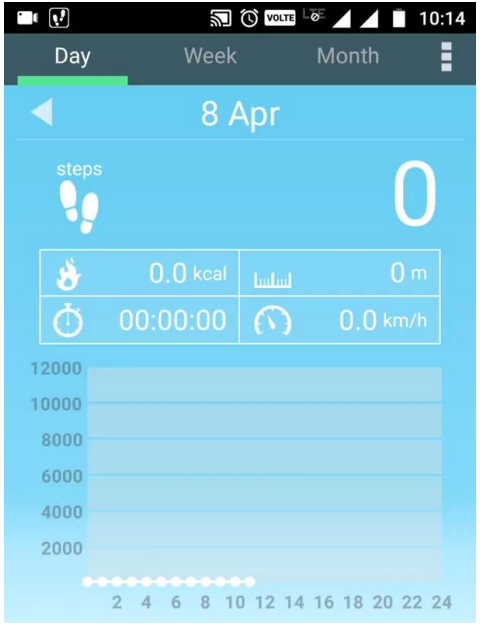
Why

How

Context (passive awareness)



Caller app



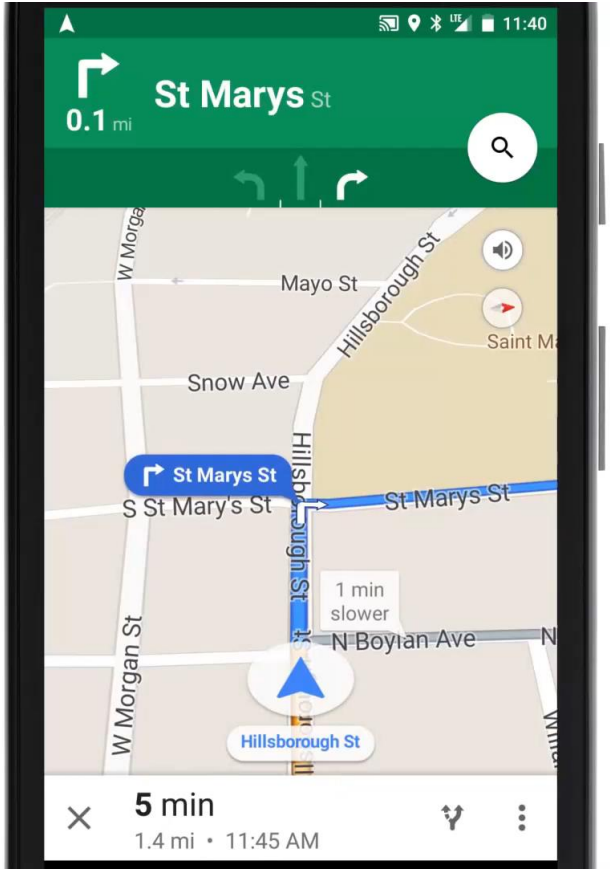
Fitness app

What

Why

How

Context (active awareness)



What

Why

How

Context awareness challenges

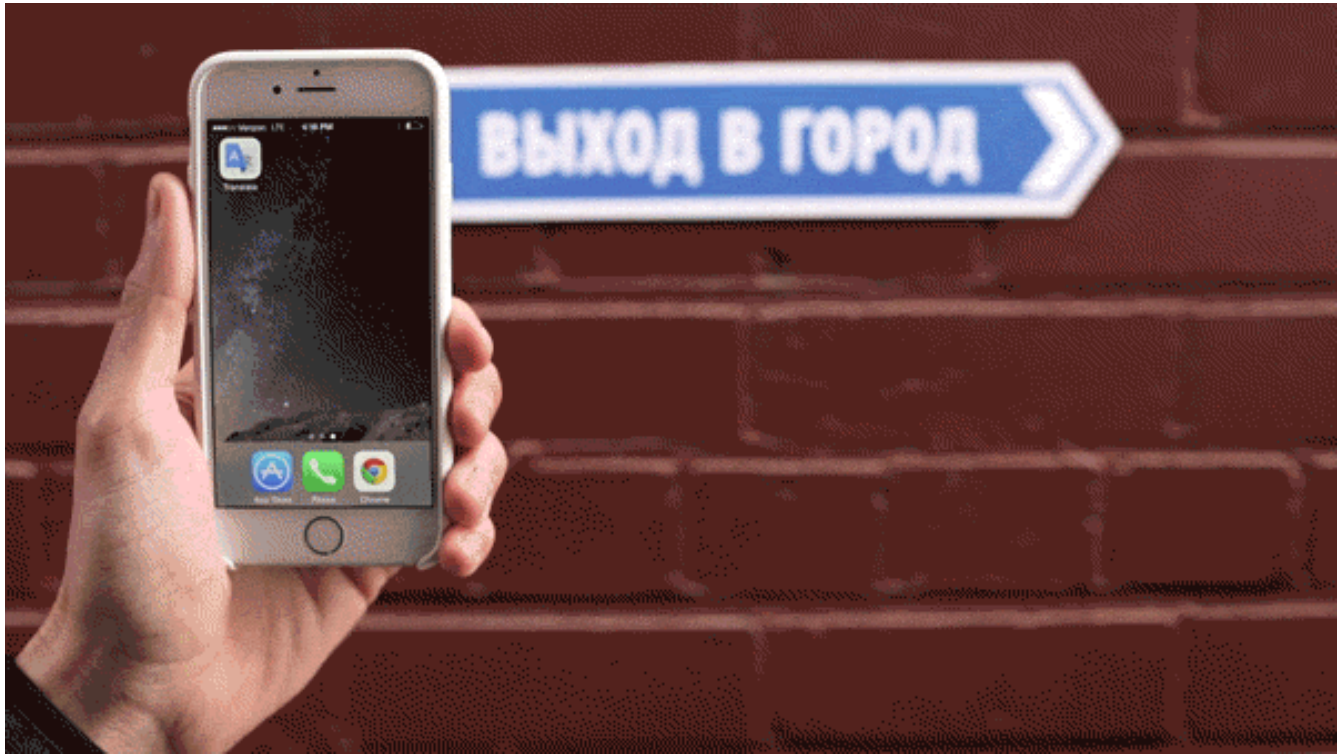
1. Incorrect environmental cues
2. Ambiguous user state
3. User privacy
4. User distraction

What

Why

How

Augmented reality apps



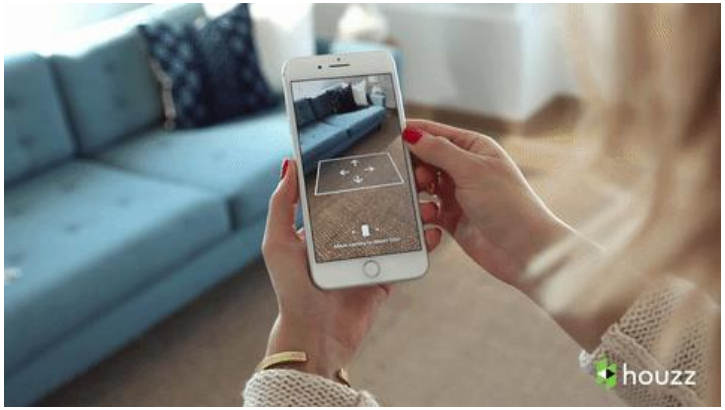
Google Translate

What

Why

How

Augmented reality apps



Furniture arrangement

Pokémon GO

What

Why

How

3 steps of Augmented Reality

1. Identifying the object

2. Computing distance and angle

3. Embedding the digital information

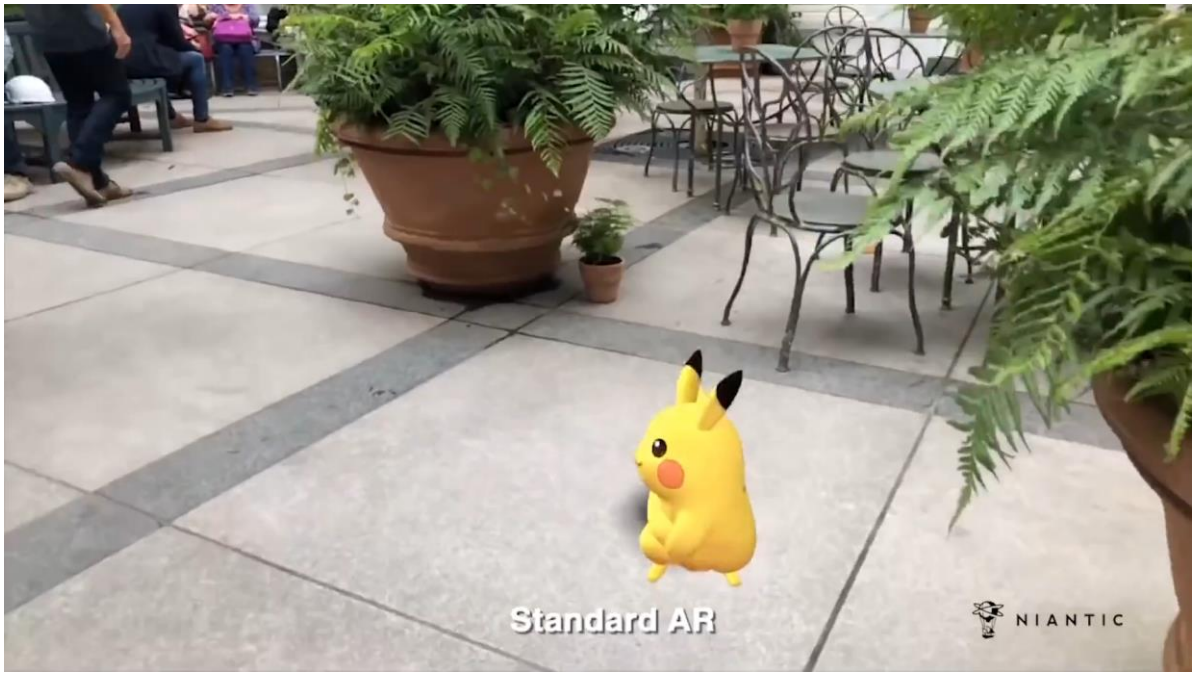
What

Why

How

Challenges of AR on mobile devices

1. Limited boundaries of the mobile screen.
2. No depth perception on mobile camera.



What

Why

How

Project Tango

Questions, feedback

Cockcroft building
C519 (Khuong)
C537 (Goran)

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