

FIRST PERSON

USER INTERFACES



BREAKING DEVELOPMENT

LUKE WROBLEWSKI



ABSTRACTION

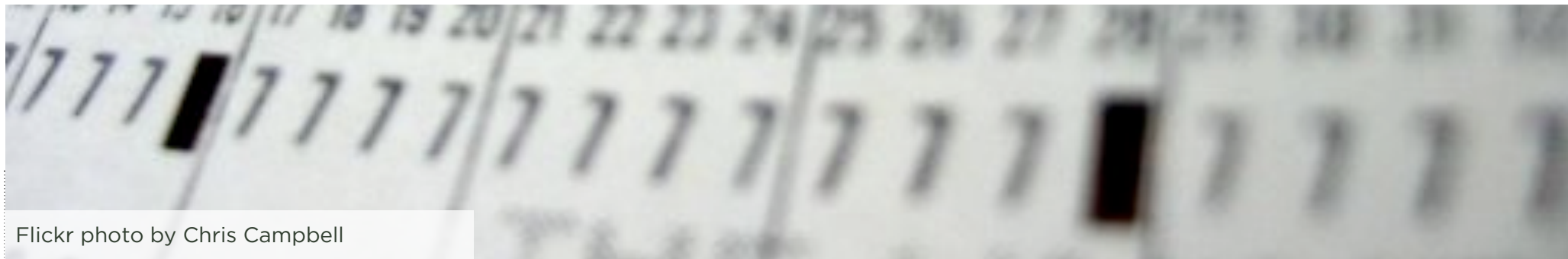
- User interfaces give you access to computing capabilities
- By abstracting away all the messy stuff

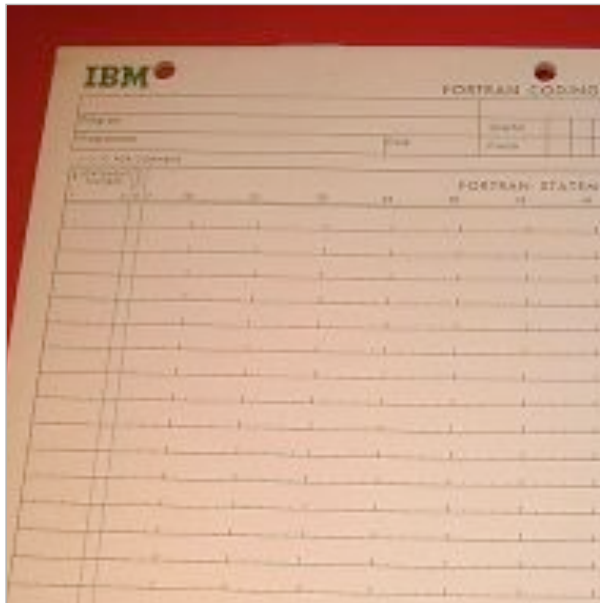




PUNCHED CARD INTERFACES

- Lived outside the computer
- Had specific formats that needed to be learned
- Had to be punched by hand or on a key punch machine
- Had to be fed into a computer
- Output was delivered on paper





PUNCHED CARD INTERFACES



LAYERS OF ABSTRACTION

INPUT

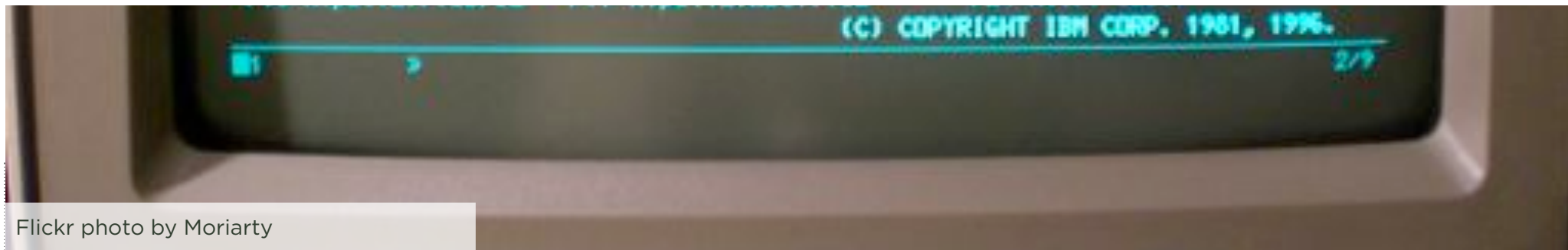
OUTPUT

Punched Cards Interfaces



COMMAND LINE INTERFACES

- Input typed directly on computer
- Required specific commands & syntax
- Objects and actions hidden behind cryptic commands



-o	Set the output file, if appropriate
-i	Add an input file.
-stdin	Read input from standard input
-stdout	Send result to standard output
-change-id	Change the file's /ID tag
-keep-version	Don't change the version number
-l	Linearize output files where possible
-merge	Merge a number of files into one
-retain-numbering	Don't renumber pages when merging
-remove-duplicate-fonts	Remove duplicate fonts when merging
-split	Split a file into individual pages
-chunk	Set chunk size for -split (default 1)
-split-bookmarks	Split a file at bookmark boundaries at a given level
-scale-page	-scale-page "sx sy" scales by (sx, sy).
-shift	-shift "dx dy" shifts the chosen pages by (dx, dy).
-rotate	Set rotation of pages to 0, 90, 180, 270
-rotateby	Rotate pages by 90, 180 or 270 degrees
-rotate-contents	Rotate contents of pages
-upright	Make pages upright
-hflip	Flip pages horizontally
-vflip	Flip pages vertically
-crop	Crop specified pages
-remove-crop	Remove cropping on specified pages
-mediabox	Set media box on specified pages
-encrypt	Encrypt a document
-decrypt	Decrypt a file
-no-edit	No edits
-no-print	No printing
-no-copy	No copying
-no-annot	No annotations
-no-forms	No forms
-no-extract	No extracting
-no-assemble	No assembling
-no-hq-print	No high quality printing
-no-encrypt-metadata	Don't encrypt metadata (AES only)
-decompress	Decompress
-compress	Compress with FlateDecode. Leaves metadata alone.
-list-bookmarks	List Bookmarks
-remove-bookmarks	Remove bookmarks from a file
-add-bookmarks	Add bookmarks from the given file
-presentation	Make a presentation
-trans	Set the transition method for -presentation
-duration	Set the display duration for -presentation
-vertical	Set dimension for Split and Blinds styles
-outward	Set direction for Split and Box presentation styles

```

Terminal — bash — 70x60
Last login: Wed Oct 12 13:21:17 on ttys000
LukeWi7:~ lukew$ 
bagid
itemid
AddItem
LukeWi7:~ lukew$ item
bag dislike
bag composite
bag createbag
bag deletebag
bag deletecommentonbag
bag deletecommentonbaggedites
bag editbag
bag editcommentonbag
bag editcommentonbaggedites
bag editites
bag featured
bag feed
bag following
bag get
bag lookup
bag lookupbagcomment
bag lookupbaggeditescomment
bag lookupites
bag moveites
bag newbags
bag recent
bag removeites
bag search
bag searchbags
bag set
bag setcomposite
bag share
bag similarbags
bag suggestites
bag unlikebaggedites
bag unmerge
LukeWi7:~ lukew$ 

```

```
./bagcheck bag additem name='toast'
```


LAYERS OF ABSTRACTION

INPUT

OUTPUT

Punched Cards Interfaces

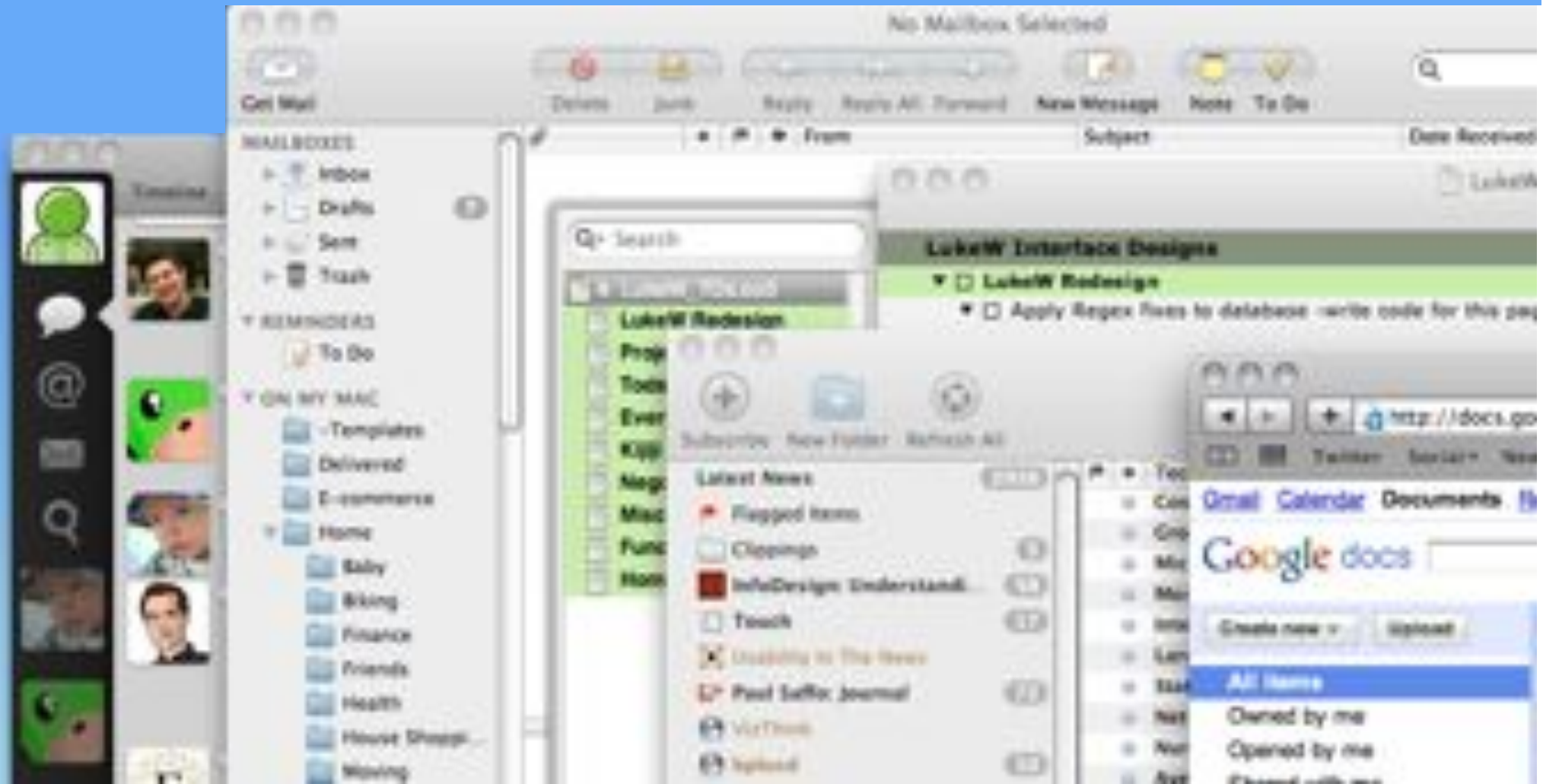
Command Line Interfaces



GRAPHICAL USER INTERFACES

- Made objects and actions visible
- Enabled manipulation through icons, controls, and mouse
- Resulted in lots of time interacting with UI components





LAYERS OF ABSTRACTION

INPUT

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Punched Cards Interfaces

Command Line Interfaces

Graphical User Interfaces

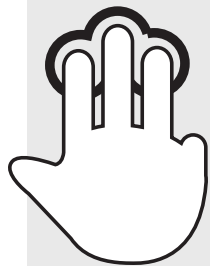
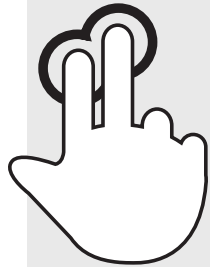
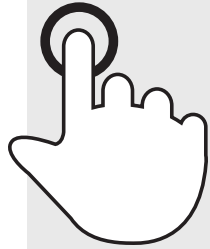






NATURAL USER INTERFACES

- The content itself serves as the interface
- Interact with guessable, physical, and realistic gestures
- Make use of skills learned through a lifetime of living



Tap

Double Tap

Swipe/Drag

Flick

Pinch

Spread

Press

Rotate





LEAP

- Control a computer in three dimensions
- With your natural hand and finger movements





Exemplary Setup: Doorknob Gesture





LAYERS OF ABSTRACTION

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Graphical User Interfaces

Natural User Interfaces

LAYERS OF ABSTRACTION

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Punched Cards Interfaces

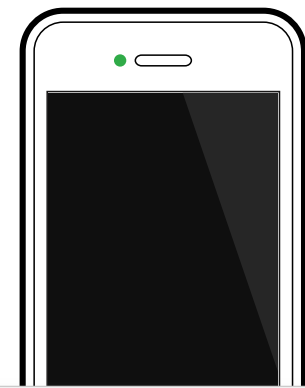
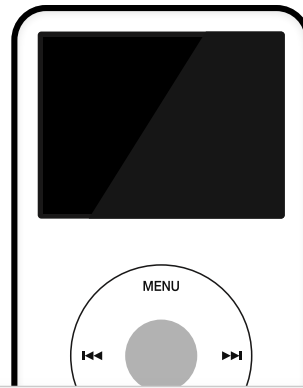
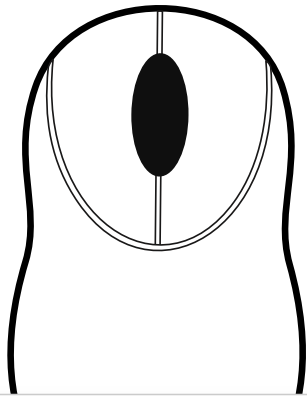
Command Line Interfaces

Graphical User Interfaces

Natural User Interfaces

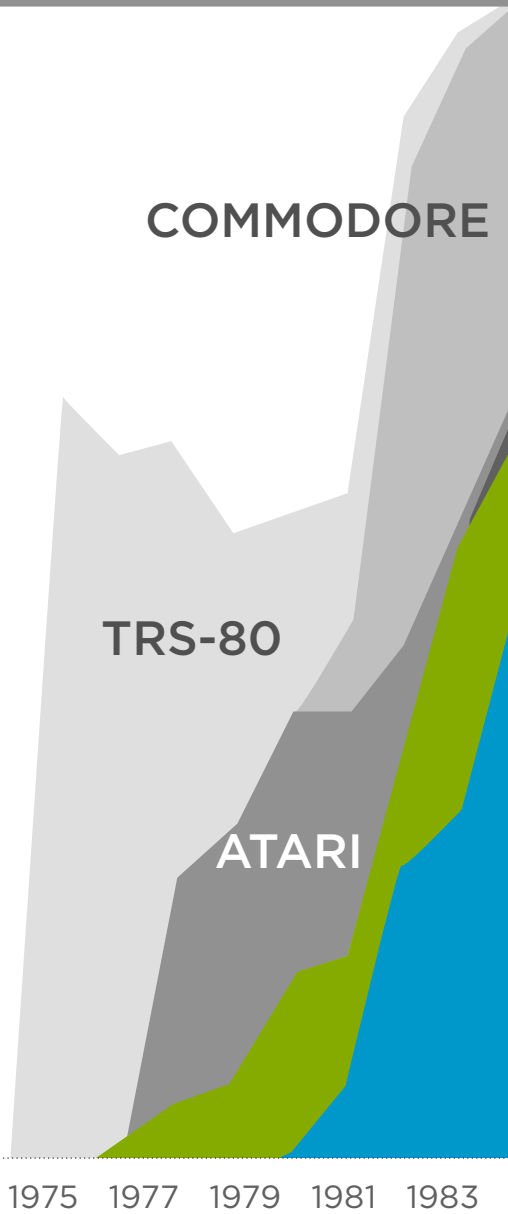
First Person User Interfaces

NEW INPUT METHODS



“Each new input method led to not just a disruption but new platforms and new business models.”

Share of Personal Computing



Source: <http://bit.ly/xDzag2>

Mobile Phone Profits

Q2/2007 Q1/2008



Source: <http://bit.ly/udBlqO>

LAYERS OF ABSTRACTION

INPUT

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Punched Cards Interfaces

Command Line Interfaces

Graphical User Interfaces

Natural User Interfaces

First Person User Interfaces

FIRST PERSON USER INTERFACES

Allow people to digitally interact with the real world as they are currently experiencing it.

Sensor Capabilities

- Location detection: GPS, WiFi, cell towers
- Orientation: direction from a digital compass
- Device positioning & motion: from an accelerometer
- Audio: input from a microphone; output to speaker
- Video & image: capture/input from a camera
- Device connections: through Bluetooth between devices
- Proximity: device closeness to physical objects
- Ambient Light: light/dark environment awareness
- RFID reader: identify & track objects with broadcasted identifiers
- Multi-touch sensors
- Haptic feedback: “feel” different surfaces on a screen
- Biometrics: retinal, fingerprint, etc.



FIRST PERSON USER INTERFACES

- Interaction through a set of always-on sensors
- Instant, relevant output based on your current position
- Or based on who or what is near you

FIRST PERSON USER INTERFACES

1. Navigate the space around you
2. Augment your immediate surroundings
3. Interact with nearby objects or people

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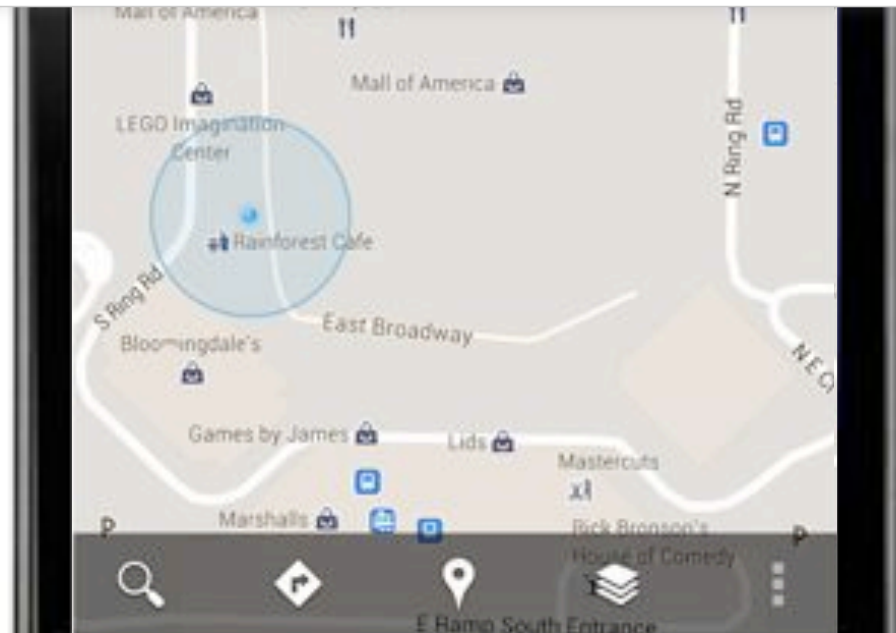


Indoor Location



your entry point (via GPS), then count your steps (accelerometer), direction (gyroscope), & altitude (altimeter)

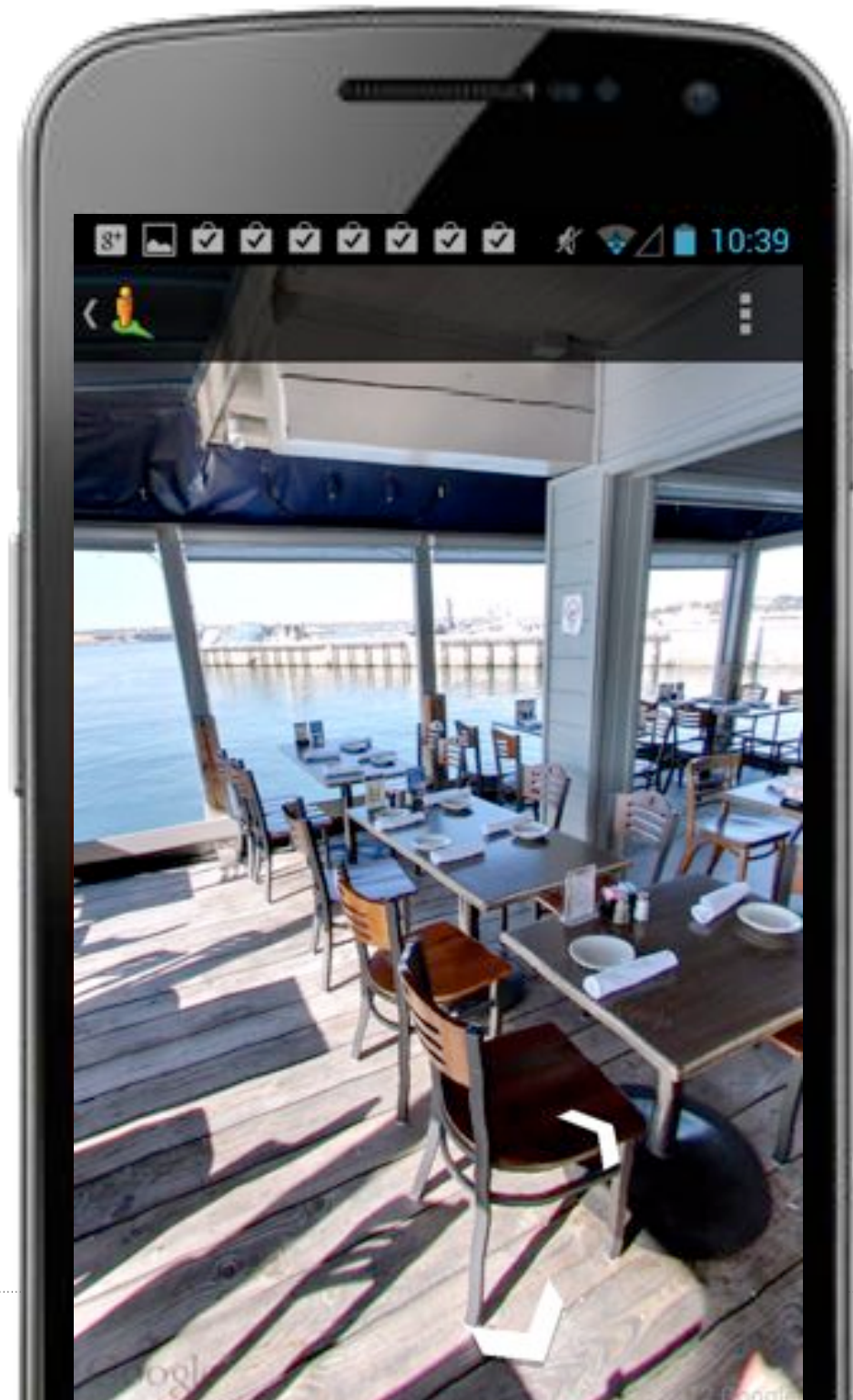
gyroscope, magnetometer, accelerometer, and altimeter



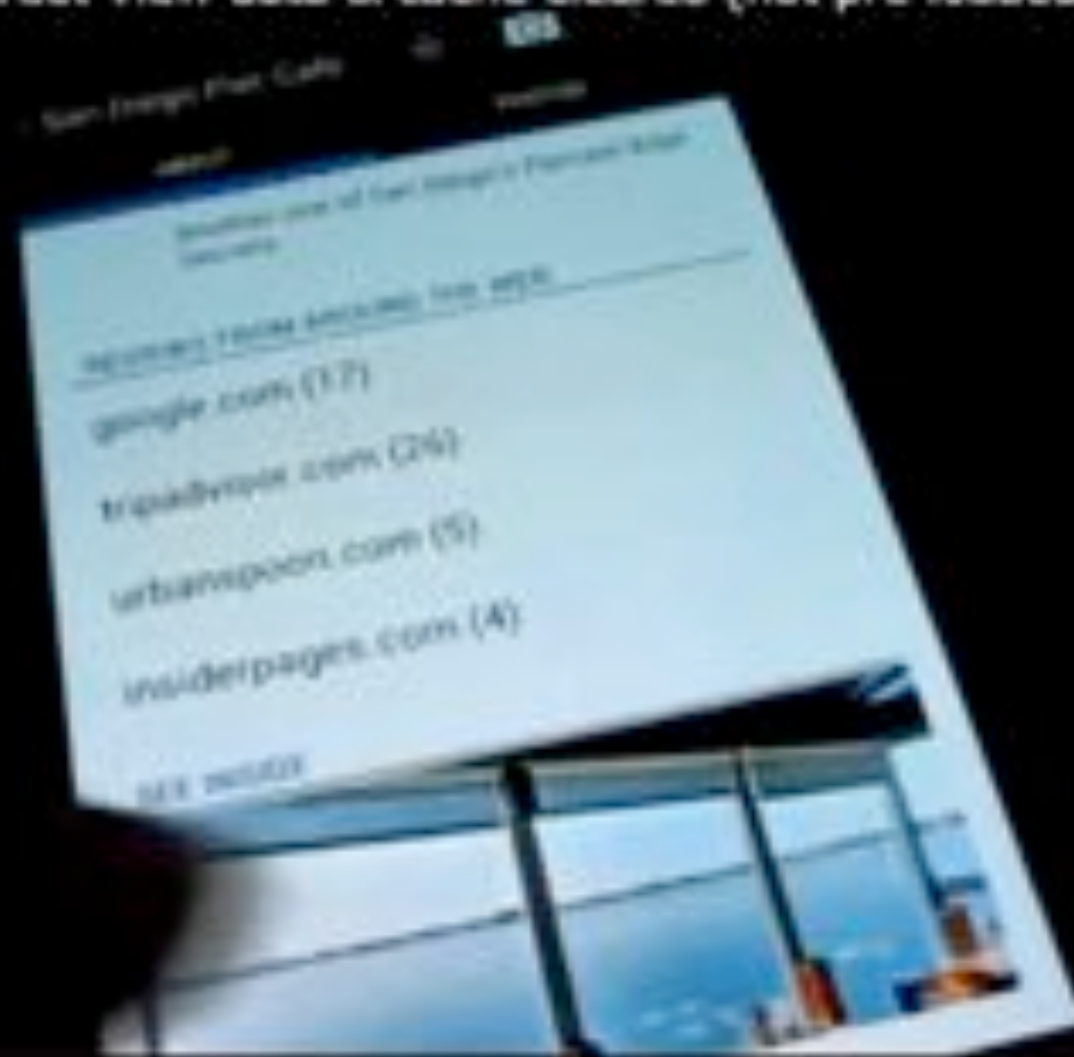
Location Detection

arrange list based on location





Maps and Street View data & cache cleared (not pre-loaded)



9-axis motion and orientation sensing

- Angular speed

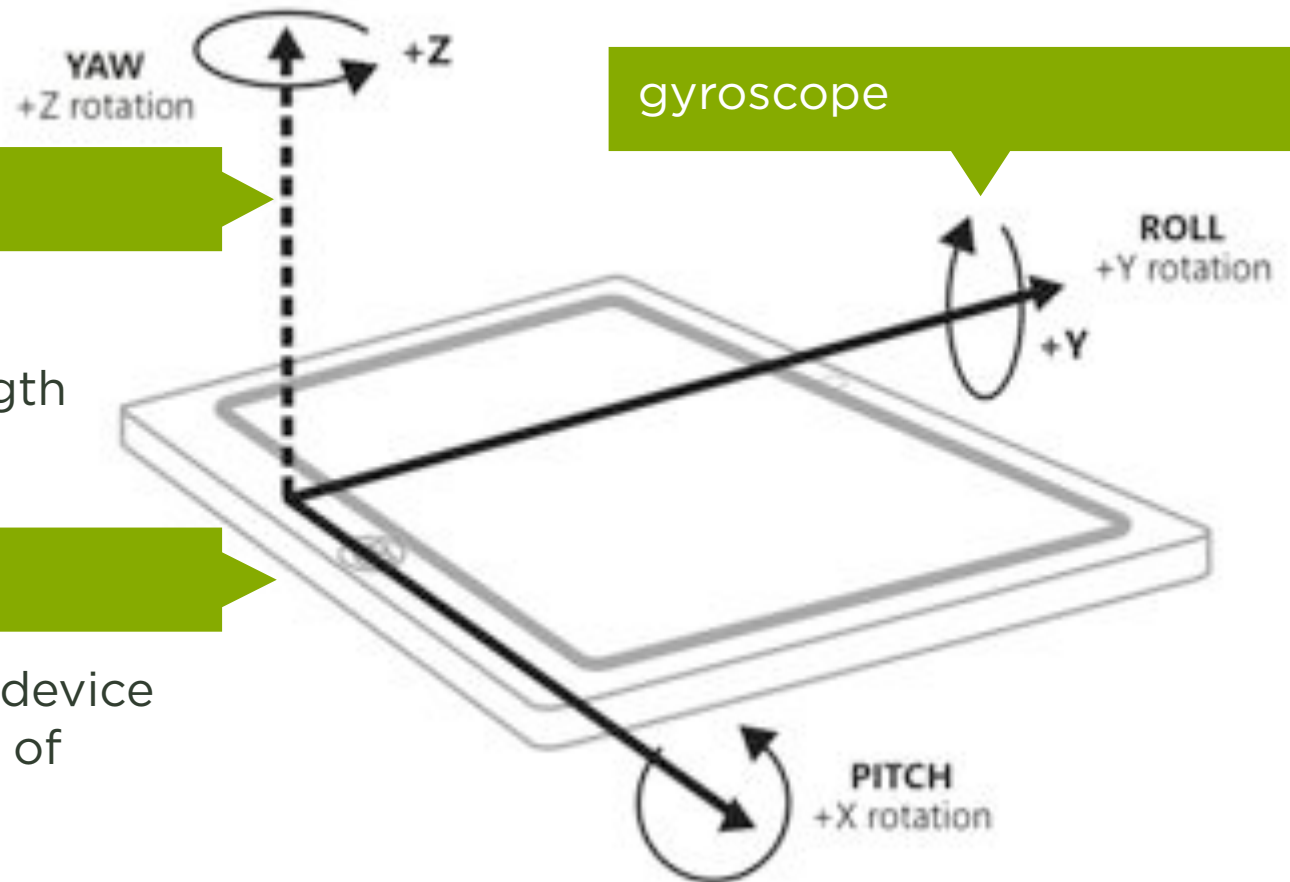
gyroscope

magnetometer

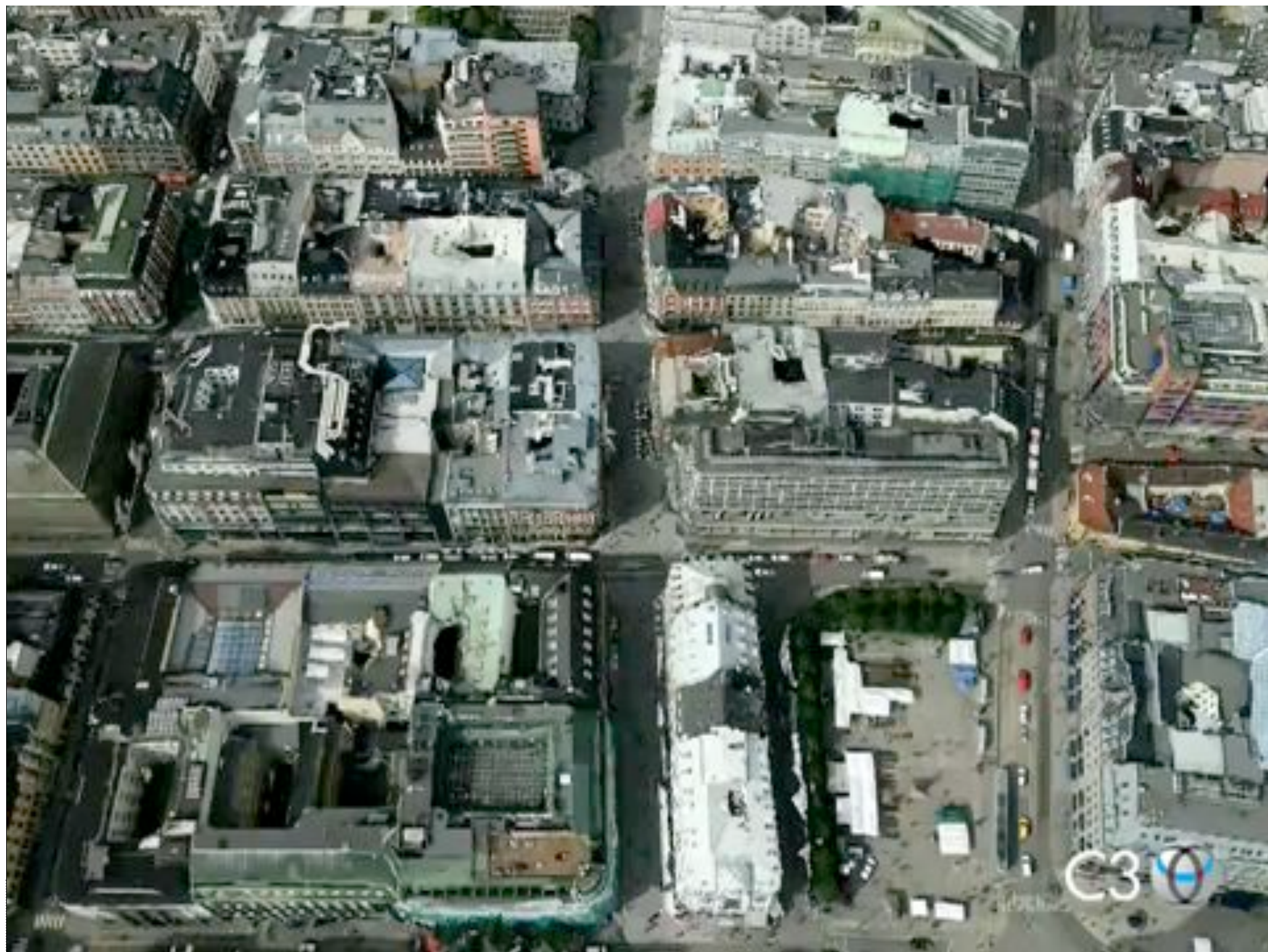
- Digital compass
- Magnetic field strength

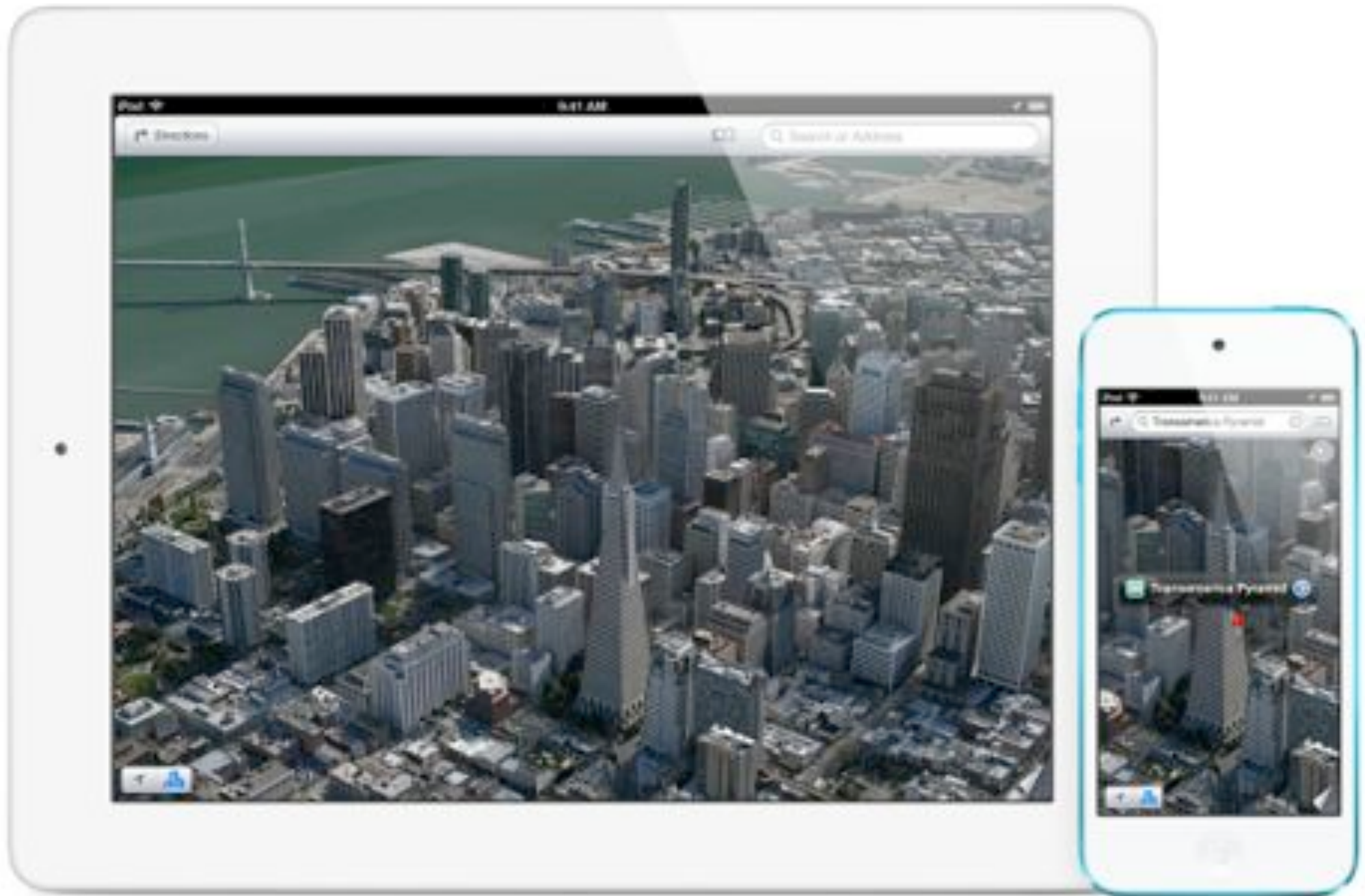
accelerometer

- Measures motion of device (roll & pitch) & force of gravity
- Linear acceleration





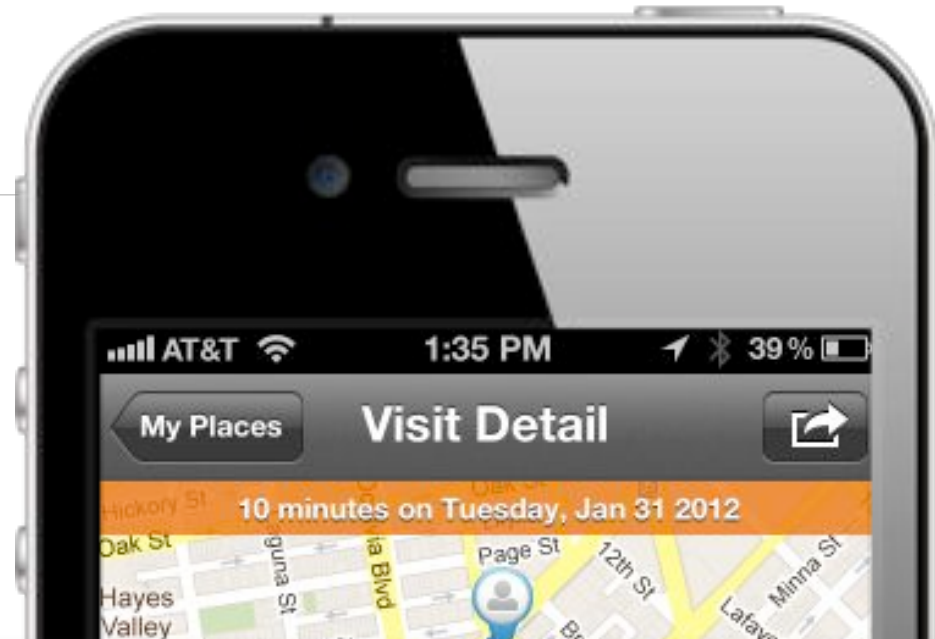




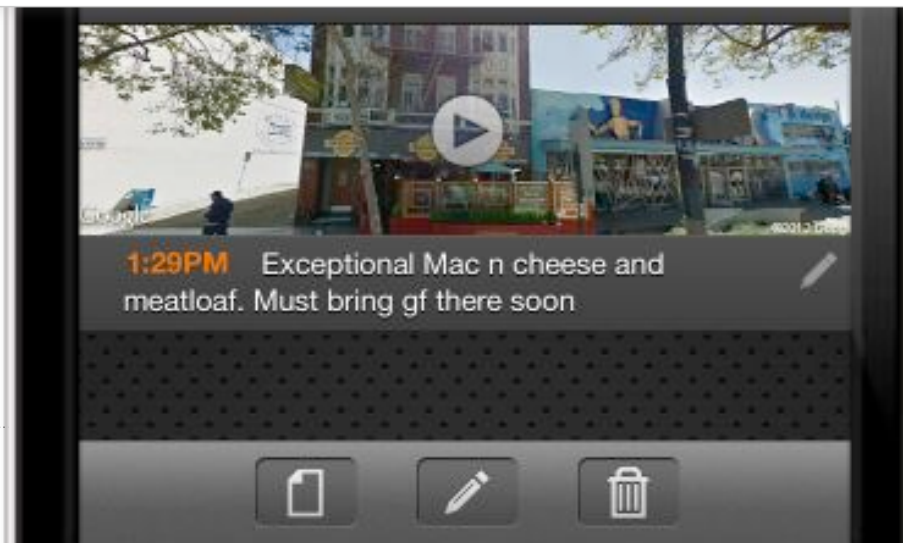
 Directions

Using new technology, we can now create
entire 3D cities from 45-degree aerial imagery.

Multiple Sensors



“uses every sensor in your handset to track your activities, location and environment.”



FIRST PERSON USER INTERFACES

1. Navigate the space around you
2. Augment your immediate surroundings
3. Interact with nearby objects or people



Augmented Outdoors







When discovered by users
boosted their sustained traffic
by 40 to 50 percent.

“It was sort of beyond our
expectations. We had no idea.”

Yelp CEO,
Jeremy Stoppelman



OVERVIEW &
ORIENTATION

MARKERS

DATA WINDOW

IBM Seer at Wimbledon



Wikitude AR Guide



MARKERS

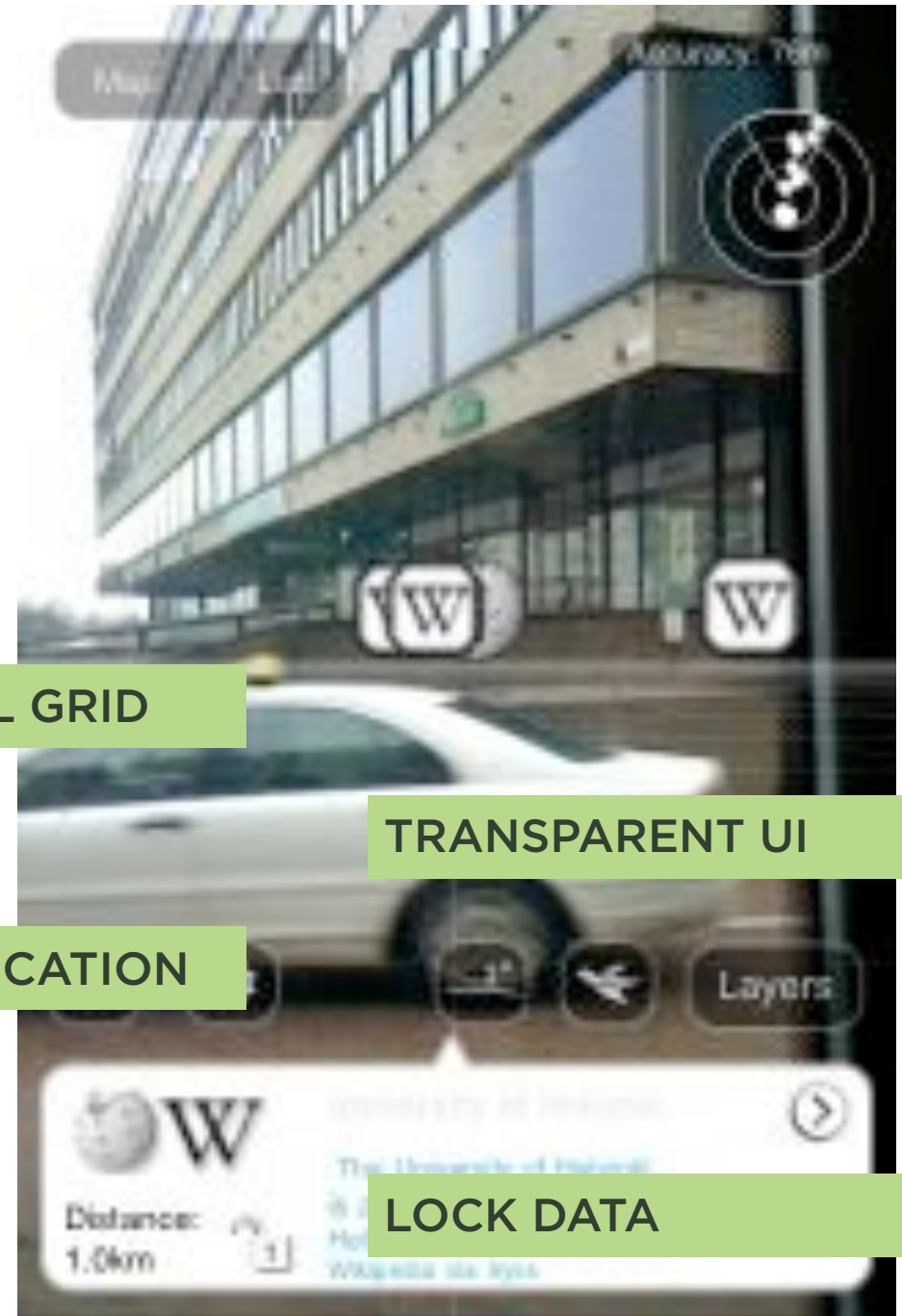
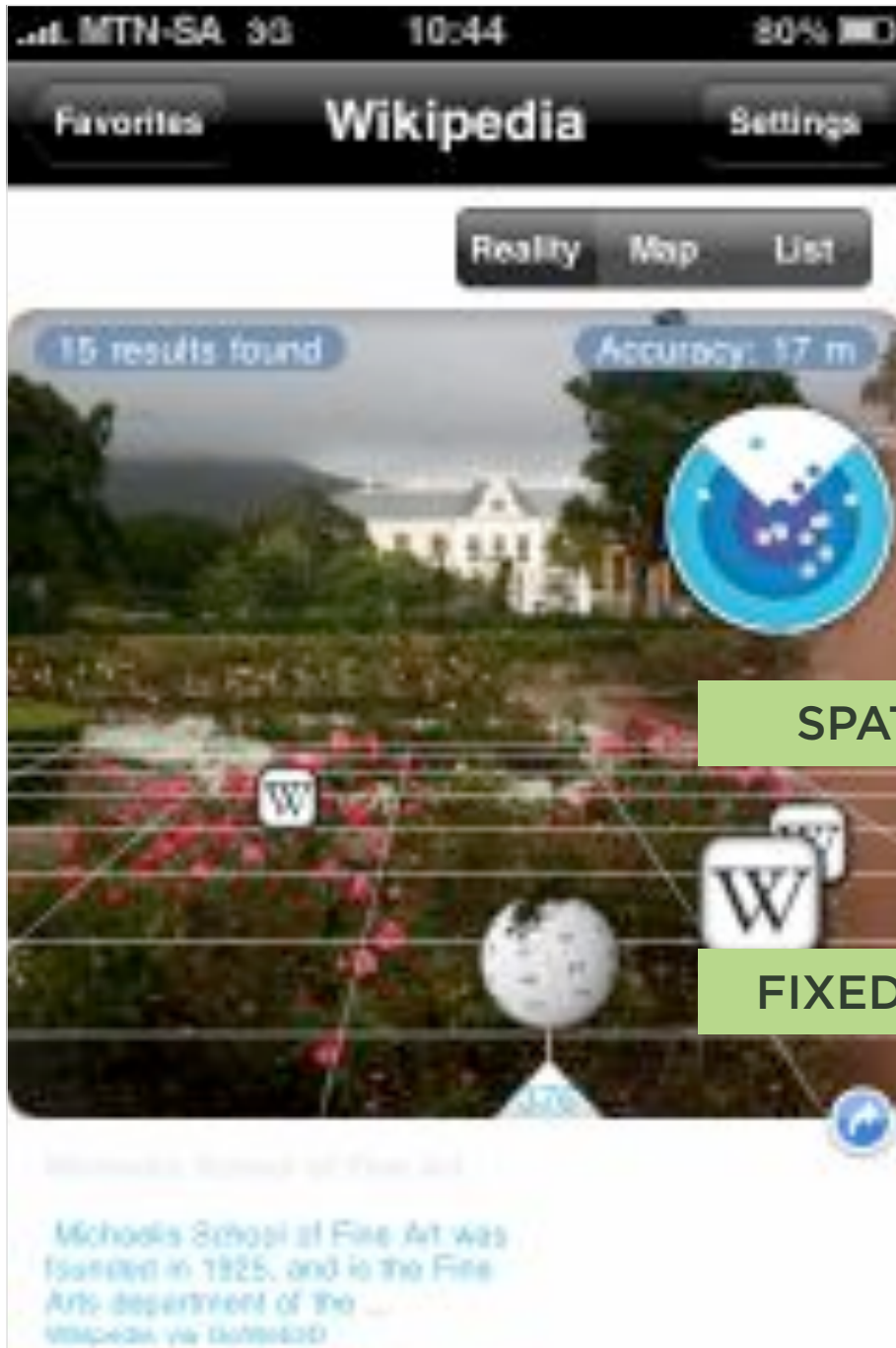
DATA WINDOW

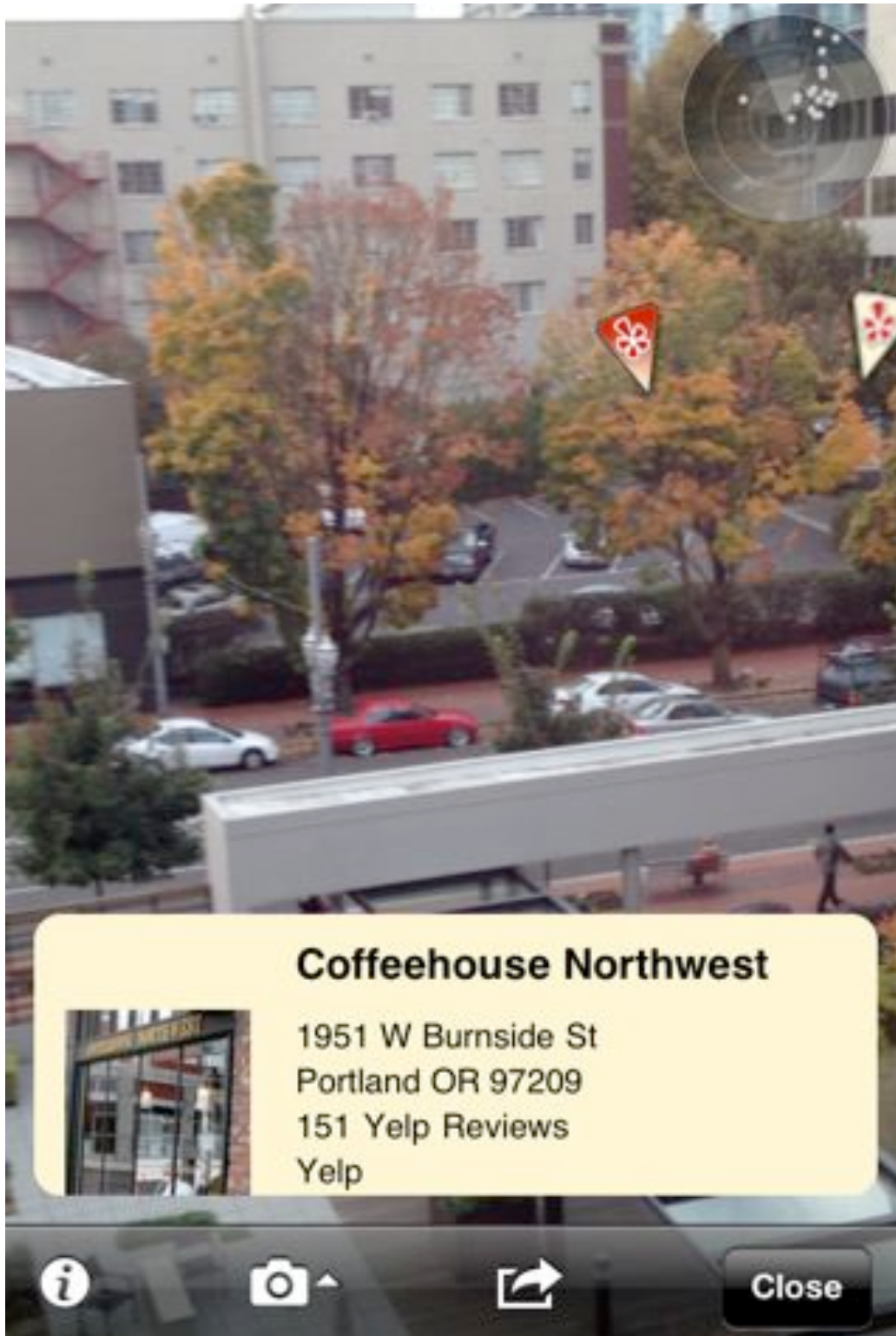
ZOOM/SCALE

OVERVIEW &
ORIENTATION

Marker Overload







OVERVIEW &
ORIENTATION

MARKERS

FIXED LOCATION

TRANSPARENT UI

OVERVIEW & ORIENTATION

NOKIA

 Nearby



 Prentiss Brown Thea...
★★★★★ 0.44mi

 Banana Republic
★★★★★ 0.02mi

 Posh Bagel
★★★★★ 0.02mi

 Old Town
★★★★★ 0.04mi

 GapBody
★★★★★ 0.04mi

 Steamer's Grill House
★★★★★ 0.04mi

 Wine Cellar
★★★★★ 0.05mi

TRANSPARENT UI



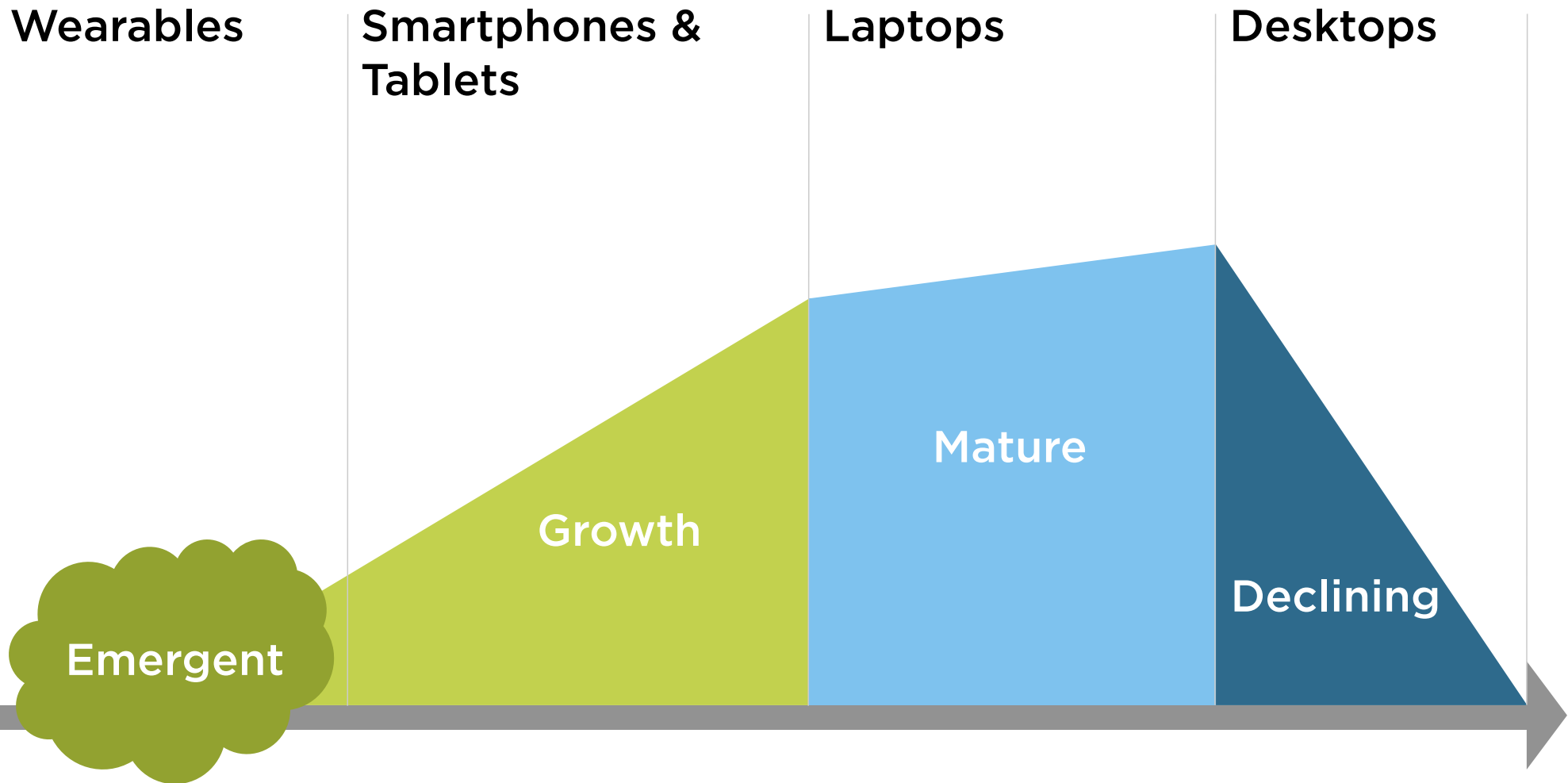
3D MARKERS



HIDE WHEN NOT
IN LINE OF SIGHT



Usage Curve



Usage Curve

First Person
Interfaces

Natural User
Interfaces

Graphical User
Interfaces

Command
Line
Interfaces



Emergent

Growth

Mature

Declining

FIRST PERSON USER INTERFACES

1. Navigate the space around you
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Make Contacts



Process Receipts



The sweetest way to manage
all of your purchases



Easily scan or
email your
receipts



We'll digitize
and enrich
them



You'll get reports, useful
information & storage for
your receipts!



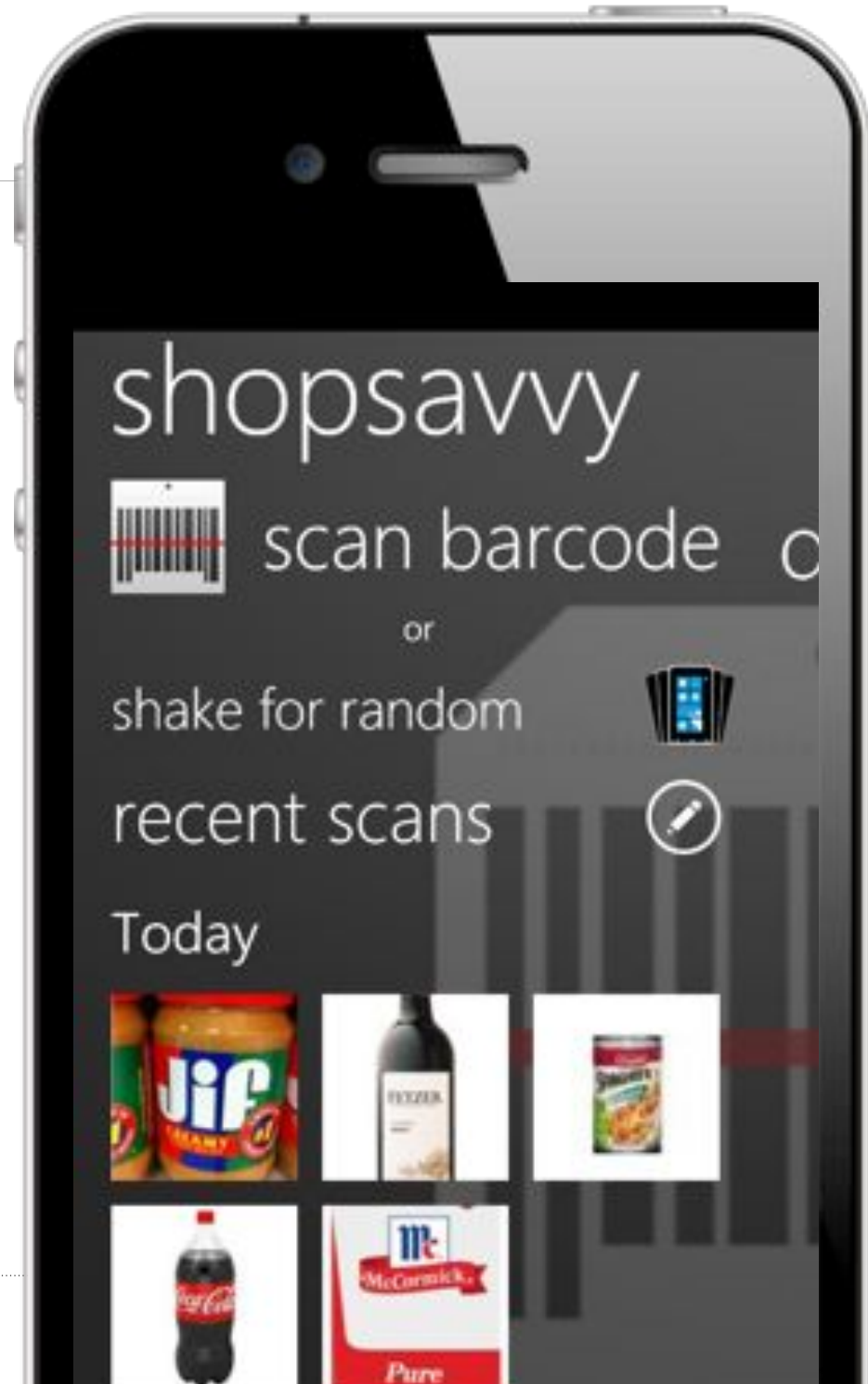
Deposit a Check



File Taxes



Buy Something



73

Buy Something



Translate Text





Word Lens -- iPhone App

QuestVisual.com

Take a Payment



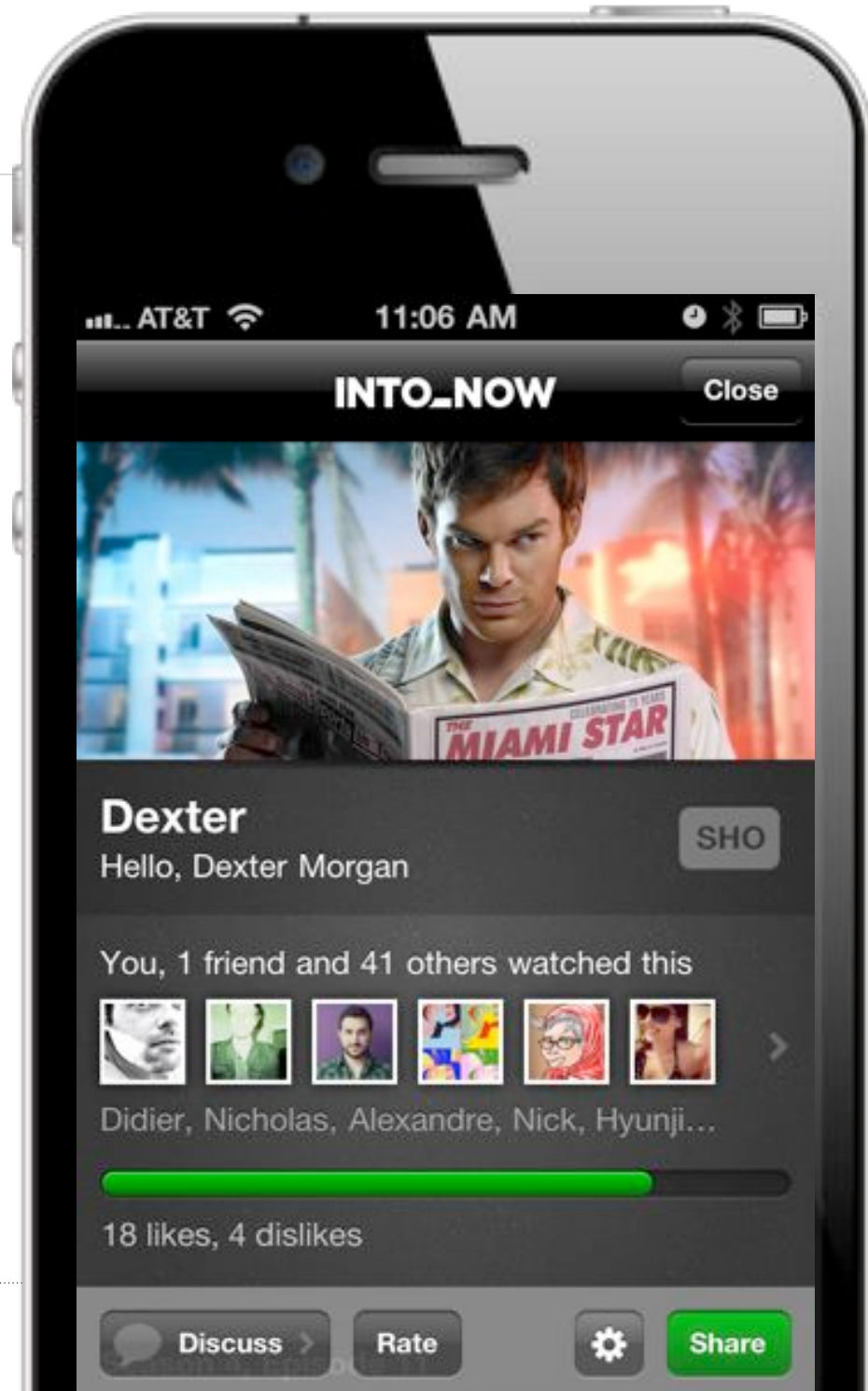




Identify Music

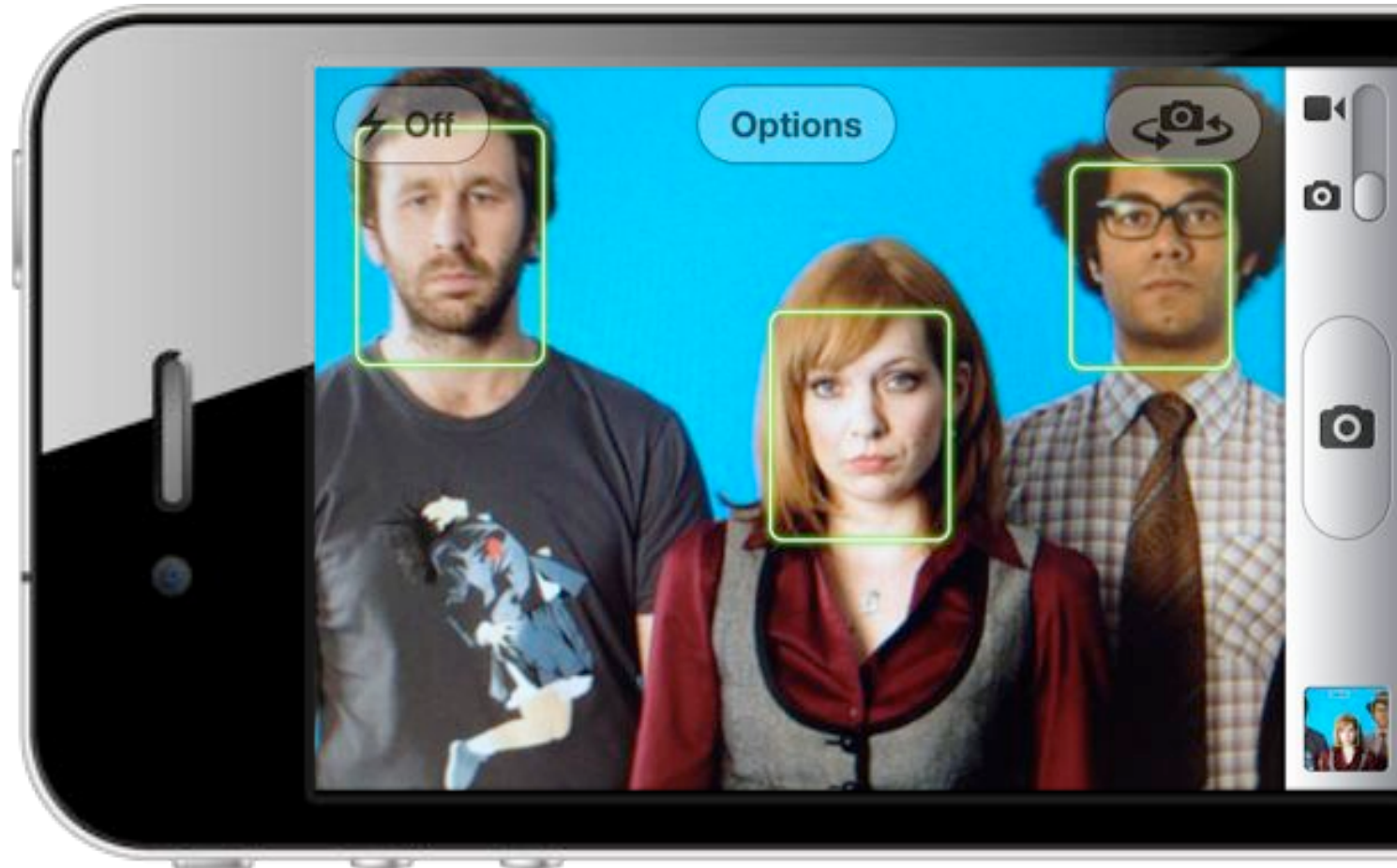


Identify Shows

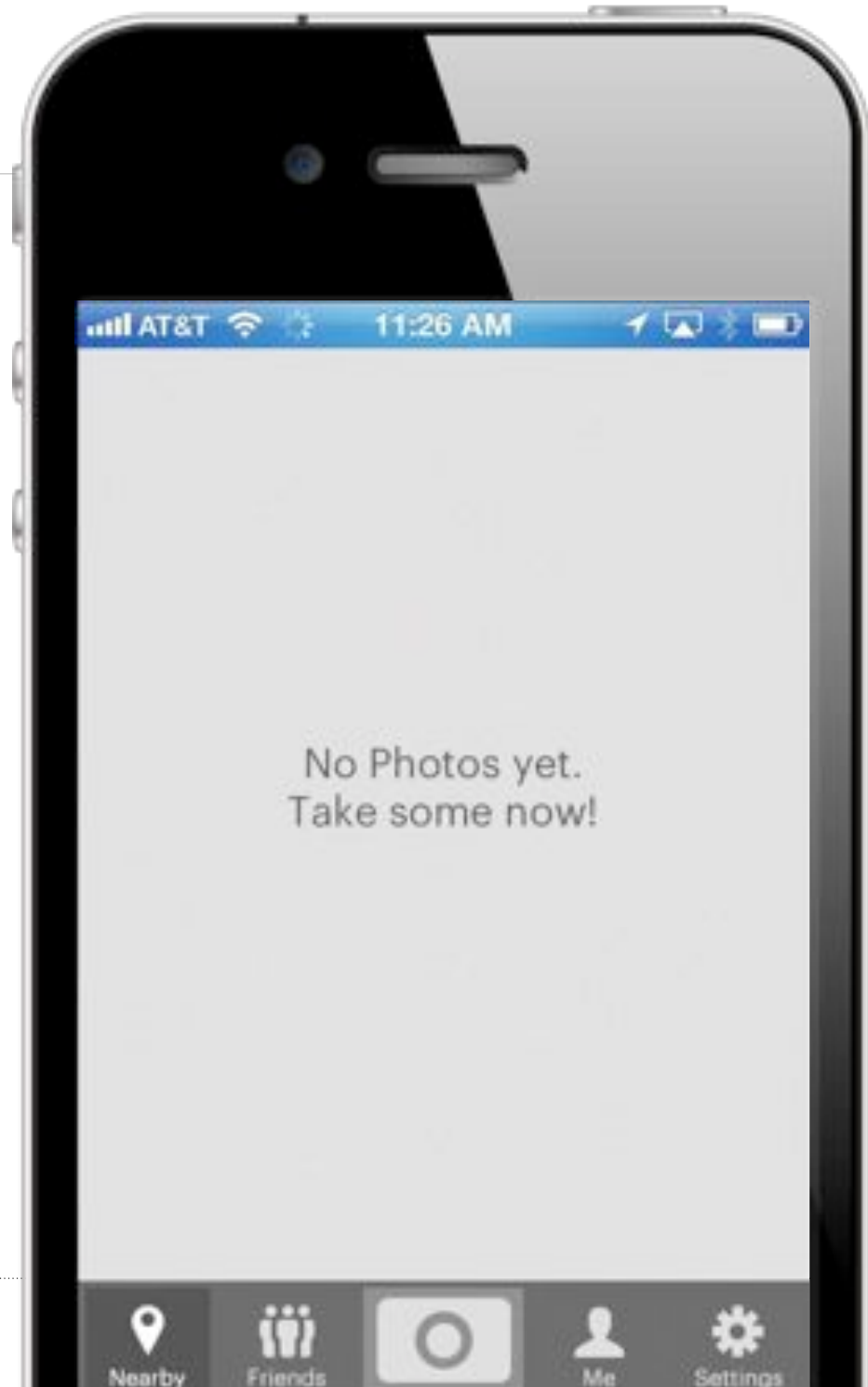


Facial Detection in iOS 5

Faces within a picture,
including the
locations of
eyes & mouths



Facial Recognition



FIRST PERSON USER INTERFACES

1. Navigate the space around you
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SMALL SCREEN, BIG WORLD



Flickr photo by Nokia Point & Find

Nokia Point & Find

**Nerd.
Found.**

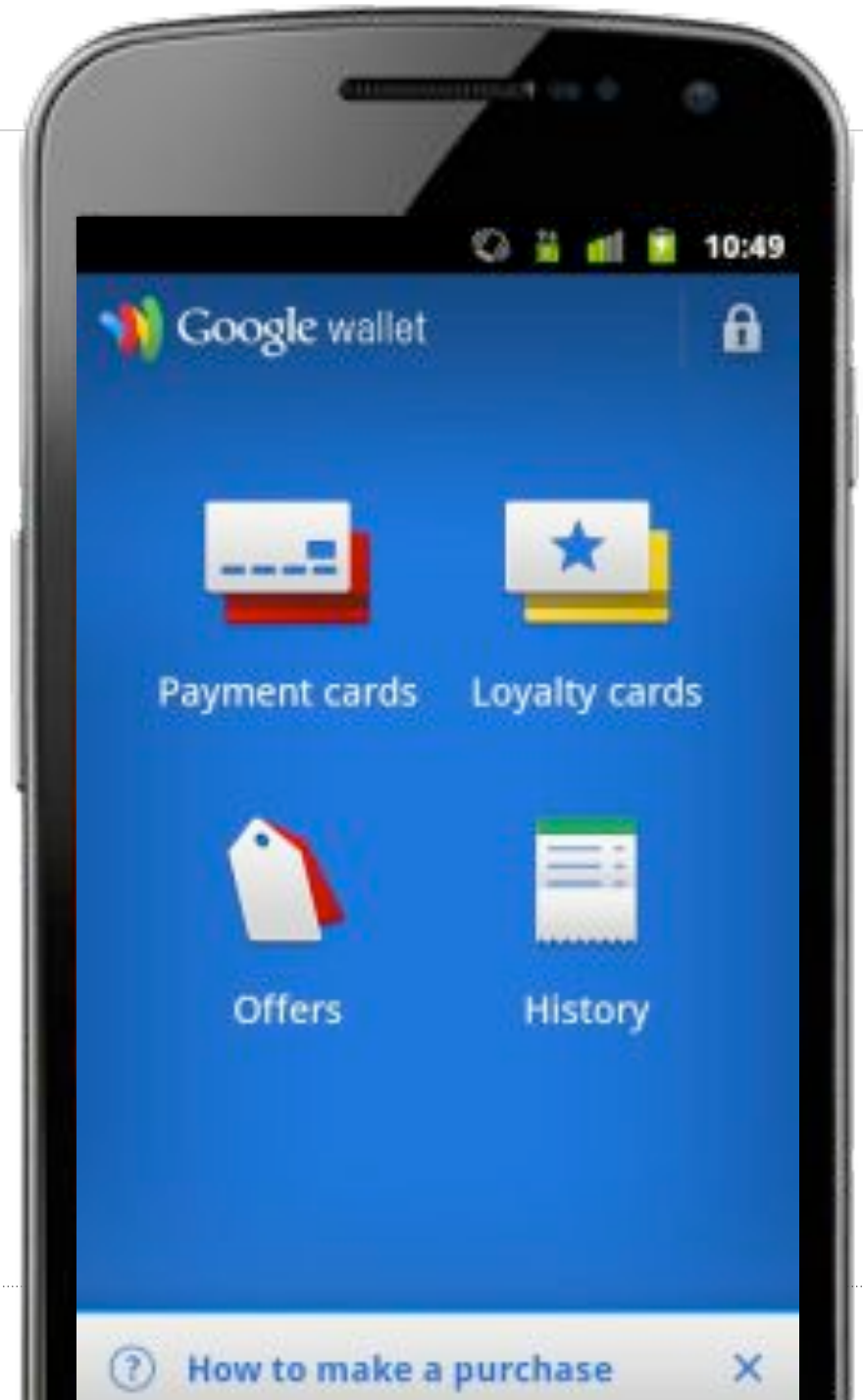


iPhone with
an RFID/NFC
reader



Near Field (NFC)

- Close-range radio communication between phones/devices, tags
- Require a distance of 4cm or less to initiate a connection
- Can read RFID tags (one-way)





Near Field (NFC)





© 2010 Google, Imagery © 2010 DigitalGlobe, Aerialdata International Surveys, The GeoInformation Group, Inverness, Inc., GeoEye, IGN France, Map data © 2010 Tele Atlas.



Solar cell module

Electrical interconnects

Biosensor module

Sensor readout and control circuit



Energy storage module

Semitransparent display and microlens array

Telecommunication and power reception antenna

Display control circuit

Radio and power conversion circuit

FIRST PERSON USER INTERFACES

Further reduce abstraction by allowing people to interact digitally with the real world as they are currently experiencing it.

NEED DESIGN HELP

THANKS



LUKEW.COM

@LUKEW

LUKEW
IDEATION + DESIGN