

CSE 440: Introduction to HCI

User Interface Design, Prototyping, and Evaluation

Lecture 14:
Designing for Diverse Needs

James Fogarty
Eunice Jun
David Wang
Elisabeth Chin
Ravi Karkar



Tuesday / Thursday
10:30 to 11:50

Project Status

Looking Forward

3d: Usability Testing Review due Tonight

3e: Digital Mockup due Monday 2/27

3f: Getting the Design Right due Tuesday 2/28

3g: Presentation due Wednesday 3/1

4a: Initial Website due Monday 3/6

4b: Initial Video Prototype due Monday 3/6

4c: Initial Poster due Wednesday 3/8

Other Assignments

Reading 4 Due Tomorrow

CSCW 2017

The screenshot shows a web browser window titled "CSCW | Program Overview". The address bar indicates a secure connection to <https://cscw.acm.org/2017/program/>. The main content features a large banner image of a city skyline at dusk with the text "THE 20TH ACM CONFERENCE ON COMPUTER-SUPPORTED COOPERATIVE WORK AND SOCIAL COMPUTING FEBRUARY 25 - MARCH 1, 2017". To the left of the banner is the CSCW 2017 logo. Below the banner is a horizontal strip of five small images showing people in various conference settings. A navigation menu at the bottom includes links for HOME, SUBMIT, ATTEND, PROGRAM, VOLUNTEER, COMMITTEE, and SPONSORS.

Program

[Program and Proceedings](#)

[Keynote Speakers](#)

[Workshops](#)

[Lasting Impact Award](#)

[Birds of a Feather](#)

Program and Proceedings

The program describes the CSCW sessions, their timing, and all the conference social events.

You can view the [Detailed Program in Confer](#), and by creating a free account, you can use it to plan the sessions you will attend.

The complete [paper version of the program](#), which will be distributed at the conference, is available in pdf format.

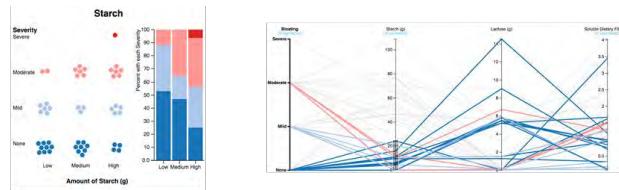
The conference proceedings are available in the ACM Digital Library and can be accessed here:

- The [Conference Proceedings](#), which contains the papers
- The [Conference Companion](#), which contains the Demos, Doctoral Colloquium, Posters, and Workshops

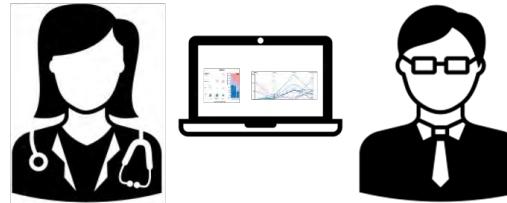
Program Overview

Supporting Patient-Provider Collaboration to Identify Individual Triggers using Food and Symptom Journals

Data Visualizations



Findings and Design Implications



Schroeder et al, CSCW 2017

<https://homes.cs.washington.edu/~jfogarty/publications/cscw2017-triggers.pdf>

From Personal Informatics to Family Informatics: Understanding Family Practices around Health Monitoring

- Families organize themselves differently
- Design to account for privacy of adults and children
- Support collaborative, multi-directional tracking



Pina et al, CSCW 2017

<https://homes.cs.washington.edu/~jfogarty/publications/cscw2017-familyinformatics.pdf>

Calendar Implications

Feb 20 Presidents Day Exam Q&A 1:30 - 2:30 CSE 403	Feb 21 Exam 10:30 - 11:50 GLD 322	Feb 22 Eunice Office Hour 1:45 - 2:45 CSE 021	Feb 23 Designing for Diverse Needs 10:30 - 11:50 GLD 322 David Office Hour 12:00 - 1:00 CSE 021 3d - Usability Testing Review (due Night Before Section)	Feb 24 Section 10:30 - 11:20 MGH 058 11:30 - 12:20 MGH 058 1:30 - 2:20 MGH 058 2:30 - 3:20 MGH 058 Reading 4: Design Patterns (due End of Day)
Feb 27 James Away Eunice Away 3e - Digital Mockup (due End of Day)	Feb 28 James Away Eunice Away 3f - Getting the Design Right (due End of Day)	Mar 1 James Away Eunice Away Ravi Office Hour 1:45 - 2:45 CSE 021 3g - Presentation (due Night Before Class)	Mar 2 Presentations 10:30 - 11:50 GLD 322 David Office Hour 12:00 - 1:00 CSE 021	Mar 3 Presentations 10:30 - 11:20 MGH 058 11:30 - 12:20 MGH 058 1:30 - 2:20 MGH 058
Mar 6 4a - Initial Website (due Night Before Class) 4b - Initial Video Prototype (due Night Before Class)	Mar 7 Video Critique, Closing Thoughts 10:30 - 11:50 GLD 322 James Office Hour 2:30 - 3:30 CSE 666	Mar 8 Eunice Office Hour 1:45 - 2:45 CSE 021 4c - Initial Poster Critique and Pitch (due Night Before Class)	Mar 9 Section 10:30 - 11:50 GLD 322 David Office Hour 12:00 - 1:00 CSE 021	Mar 10 Section 10:30 - 11:20 MGH 058 11:30 - 12:20 MGH 058 1:30 - 2:20 MGH 058 2:30 - 3:20 MGH 058 4d - Communication Critique (done In Class) 4e - Final Poster, Video, Website (due End of Day)

Presentations and Reminder

Presentations on Thursday 3/2 and Friday 3/3

7 groups will present on Thursday

entire 2:30 section (no 2:30 section Friday)

1 group from each other section

Have thoughtful questions for other groups

Be sure you prepare and rehearse

Team responsibility for the presentations

PPT(X) or PDF, embed fonts, happy to “check”

Start Publishing Logo and Website

The screenshot shows a web browser window titled "CSE 440 - Projects". The URL in the address bar is "courses.cs.washington.edu/courses/cse440/17wi/projects.html". The page has a purple header with the text "CSE 440 - Introduction to HCI - Winter 2017" and navigation links for "Home", "Projects" (which is highlighted), and "Calendar". The main content area has a purple header "Projects". Below it, there's a section titled "Project Theme" with a paragraph about personal informatics and a quote from Li et al., 2010. Another section discusses the Quantified Self movement. A "Poster Session" box contains text about the event and a photo of people at a poster session. The "Project Websites" section lists ten projects with placeholder 150x150 images: BookWurm, Bork, CC:, Cost Conscious Closet, Dash, Gale, InterAct, Jasper, LocalWay, Mind You, Mirage, and OutWrite.

Project Theme

People have long sought to better understand themselves, but recently technology advances enable new approaches. Projects explored opportunities and challenges in self-tracking, also known as personal informatics:

Personal informatics systems are systems that help people collect personally relevant information for the purpose of self-reflection and gaining self-knowledge.

Li et al., 2010.

Self-tracking and personal informatics are closely related to the Quantified Self movement, which emphasizes:

Self-knowledge through numbers.

Gary Wolf, 2009

As a focus for Winter 2017, students were asked to explore tracking beyond the self. Instead of limiting self-tracking to a isolated self-analyst, we asked students to consider how people might interact around personal data in a variety of social contexts. Any problem where multiple people collect data, or where multiple people engage in gaining value from data, introduces additional opportunities and challenges in designing for effective interaction with personal data. Students have examined the problems people encounter, then explored how new technology can go beyond the data fetish to help people in reaching their goals.

Project Websites

BookWurm	Bork	CC:	Cost Conscious Closet
Dash	Gale	InterAct	Jasper
LocalWay	Mind You	Mirage	OutWrite

Poster Session

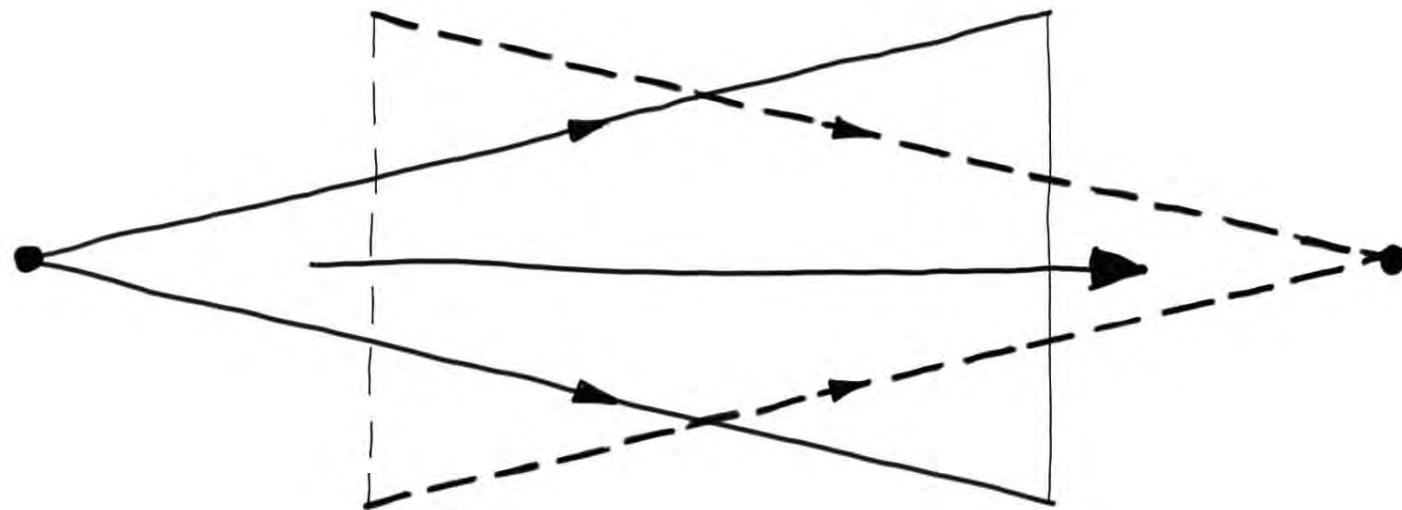
Please join us for a poster session celebrating the outstanding design work of CSE 440 students.

Monday, March 13

11:00 am to 12:00pm, CSE Atrium

A Basic Tenet of Design

If you do not actually understand your design problem, then you cannot make the best design



A Basic Tenet of Design

You are not designing for yourself

You bring a lot of background to the table

That background is your asset

But you also need to be mindful of it

You need to understand the context of
your design and the people who will use it

What this means can vary widely

And may be beyond what you can or will do

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Contextual Inquiry
Terminology:
Entering Focus

Pinkification

This is a really complicated issue

But it is not new

We will start here

Then work through more obvious problems



Bic for Her



Finally! For years I've had to rely on pencils, or at worst, a twig and some drops of my feminine blood to write down recipes (the only thing a lady should be writing ever). I had despaired of ever being able to write down said recipes in a permanent manner, though my men-folk assured me that I "shouldn't worry yer pretty little head". But, AT LAST! Bic, the great liberator, has released a womanly pen that my gentle baby hands can use without fear of unlady-like callouses and bruises. Thank you, Bic!

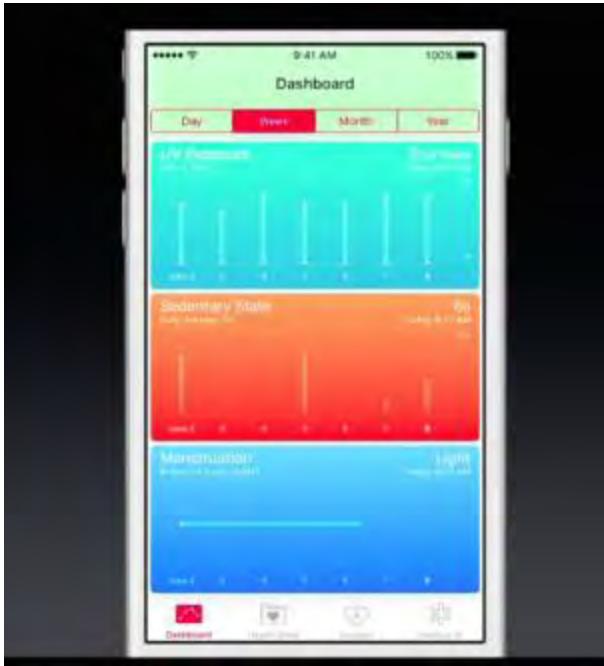
Bic for Her



It is very, very hard to imagine that the people who made the decision to launch “Bic for Her” were the same women expected to buy them.

[http://www.forbes.com/sites/davidvinjamuri/2012/08/30/
bic-for-her-what-they-were-actually-thinking-as-told-by-a-man-who-worked-on-tampons/](http://www.forbes.com/sites/davidvinjamuri/2012/08/30/bic-for-her-what-they-were-actually-thinking-as-told-by-a-man-who-worked-on-tampons/)

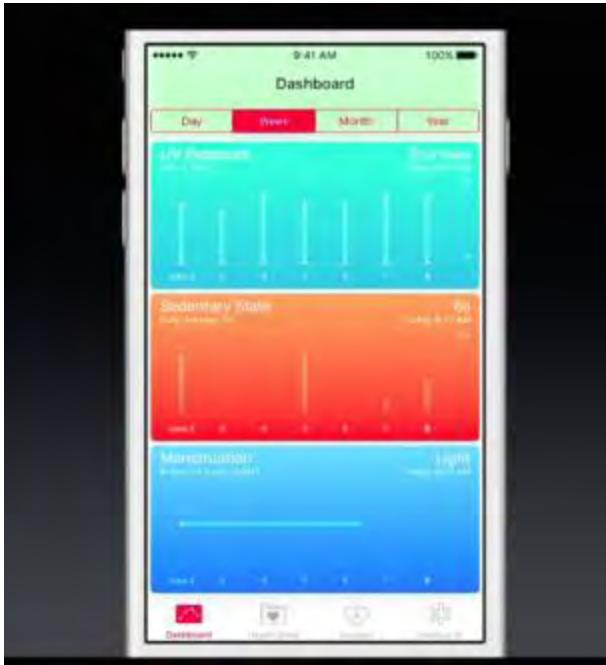
Apple HealthKit Launch



“with Health, you can monitor all of your metrics that you’re most interested in”
Apple Software executive Craig Federighi

[http://www.theverge.com/2014/9/25/6844021/
apple-promised-an-expansive-health-app-so-why-cant-i-track](http://www.theverge.com/2014/9/25/6844021/apple-promised-an-expansive-health-app-so-why-cant-i-track)

Apple HealthKit Launch



“with Health, you can monitor all of your metrics that you’re most interested in”
Apple Software executive Craig Federighi

“If you’re a human who menstruates,
you’re shit out luck”

“The fact that it’s a women’s issue isn’t
grounds for dismissal”

[http://www.theverge.com/2014/9/25/6844021/
apple-promised-an-expansive-health-app-so-why-cant-i-track](http://www.theverge.com/2014/9/25/6844021/apple-promised-an-expansive-health-app-so-why-cant-i-track)

Kodak, 1926



Kodak Vest Pocket Series III (1926)

Kodak launched this black camera in 1926
It was successful, but was selling more to men
Engaged Walter Dorwin Teague to design a model that would appeal to women
His solution was to release the camera in 5 different colors, each packed in a pseudo-silk lined box, where the box and liner matched the color of the camera

Kodak, 1926



Kodak Vest Pocket Series III (1926)

Anybody know Teague Design?

Kodak launched this black camera in 1926

It was successful, but was selling more to men

Engaged Walter Dorwin Teague to design a model that would appeal to women

His solution was to release the camera in 5 different colors, each packed in a pseudo-silk lined box, where the box and liner matched the color of the camera

Walter Downin Teague
Vanity Kodak (1928)



Apple, 2001



Apple G1 iPod, October 2001

Apple launched this white iPod in 2001

It was successful, but was selling more to men

Designed a model that would appeal to women

Their solution was a smaller version of the iPod in 5 different colors

Walter Dowrin Teague
Vanity Kodak (1928)



Jonathan Ive
Apple iPod Mini (2004)



Observations by Buxton

Same basic design brief

Same use of color

Same number and choice of colors

Same simultaneous release of colors

Teague / Kodak example is a classic

Known to any trained industrial designer

Jonathan Ive is an extremely well trained designer

Draws inspiration from the past

How About Less Controversial

Our perception of the trustworthiness and usability of a website is dramatically shaped by a first impression of appeal

How about we examine appeal around the world

Throw in age and gender for good fun

An Activity

Please rate the website you have just seen based on **visual appeal**.

very
unappealing

A horizontal scale consisting of nine empty circles arranged in a row. To the left of the first circle is the text "very unappealing". To the right of the last circle is the text "very appealing".

very
appealing

Search Toronto.com for information on local restaurants, movies and events...

SEARCH

[Home](#) / [Guides](#) / Bars Guide

Bars Guide

100 Places to Pick Up in Toronto

100 places to pick up all around Toronto. [More...](#)



Best Bars Near the Rogers Centre

Posted: May 31, 2013 | 1 Comment

By Kevin Scott

These bars around the Rogers Centre are great spots before or after the game.

[READ MORE](#)



Best Karaoke Bars with Private Rooms

Posted: March 08, 2013 | 1 Comment

By Samantha Edwards

Check out these karaoke bars with private rooms in Toronto.

[READ MORE](#)



Best Bars for Live Music in Toronto

Posted: September 20, 2012 | 1 Comment

By Stephen Baldwin

Here are the top venues in Toronto to enjoy some live music with your drink.

[READ MORE](#)



Bars with the Best Late-Night Menus

Posted: November 15, 2012 | 1 Comment

By Samantha Edwards

Here are five bars with a great late-night menu.

[READ MORE](#)

Restaurant Finder

Search by Cuisine

Search by Neighbourhood

Search by User Rating

OR

Search by Name

Show Me

BRUNCH | TAKEOUT | STEAKHOUSES

Event Finder

Search by Event Type

From: _____ To: _____

Search by User Rating

OR

Search by Event Name

Show Me

WHATS ON | CALENDAR

Movie Finder

Search by Movie Title

OR

Search by Theatre

OR

Search by Neighbourhood

OR

Search by Genre

Show Me

REVIEWS | TRAILERS | COMING SOON

Please rate the website you have just seen based on **visual appeal**.

very
unappealing

A horizontal row of nine empty circles, evenly spaced, used for rating the visual appeal of a website.

very
appealing

tapir design



classic design for today.

Tapir Design specialises in producing attractive, stylish websites that are accessible to all Internet users, regardless of the web browser or computer operating system that they use.

Contact the webmaster

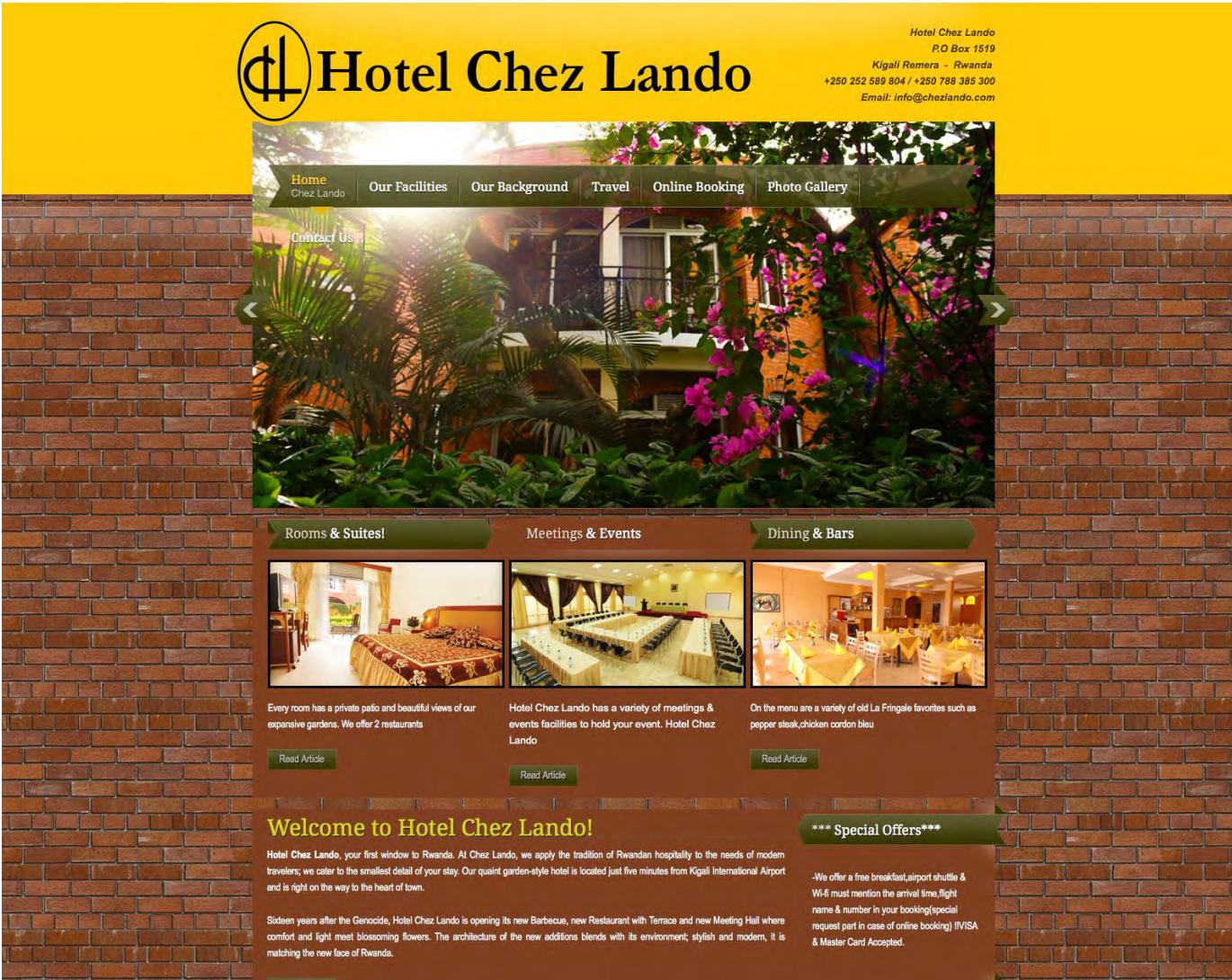
[Click here for the Tapir Blog](#) for all of your tapir news from around the globe

Please rate the website you have just seen based on **visual appeal**.

very
unappealing

A horizontal scale consisting of nine empty radio buttons arranged in a row, centered horizontally on the page.

very
appealing



Hotel Chez Lando

Hotel Chez Lando
P.O Box 1519
Kigali Remera - Rwanda
+250 252 589 804 / +250 788 385 300
Email: info@chezlando.com

Contact Us

Home Chez Lando Our Facilities Our Background Travel Online Booking Photo Gallery

Rooms & Suites! Meetings & Events Dining & Bars

Every room has a private patio and beautiful views of our expansive gardens. We offer 2 restaurants

Read Article

Hotel Chez Lando has a variety of meetings & events facilities to hold your event. Hotel Chez Lando

Read Article

On the menu are a variety of old La Fringale favorites such as pepper steak, chicken cordon bleu

Read Article

Welcome to Hotel Chez Lando!

Hotel Chez Lando, your first window to Rwanda. At Chez Lando, we apply the tradition of Rwandan hospitality to the needs of modern travelers; we cater to the smallest detail of your stay. Our quaint garden-style hotel is located just five minutes from Kigali International Airport and is right on the way to the heart of town.

Sixteen years after the Genocide, Hotel Chez Lando is opening its new Barbecue, new Restaurant with Terrace and new Meeting Hall where comfort and light meet blossoming flowers. The architecture of the new additions blends with its environment; stylish and modern, it is matching the new face of Rwanda.

*** Special Offers***

We offer a free breakfast, airport shuttle & Wi-Fi must mention the arrival time, flight name & number in your booking (special request part in case of online booking) IVISA & Master Card Accepted.

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A horizontal row of nine empty circles, evenly spaced, used for rating the visual appeal of a website.

very
appealing

THE PEOPLE'S BANK
Banki yacu, Hafi yacu.

RETAIL BANKING BUSINESS BANKING RURAL BANKING SERVICES ABOUT BPR CONTACT US

Enter keyword here...

KEEP TRACK OF YOUR ACCOUNT ON THE GO. WITH SMS & EMAIL ALERTS

You want to acquire your first drive?

Carry your bank with you 24/7

Simple things that make life easier.

LATEST NEWS

On the 18th of June, 2013 Banque Populaire du Rwanda scooped an Award as the Best Agri Business...

Banque Populaire du Rwanda on Friday of the 26th April, 2013, held a commemoration ceremony to...

Banque Populaire du Rwanda Tariff Guide

EXCHANGE RATES

Currency	Selling	Buying
USD	696.824572	679.824572
EURO	984.813009	925.006257
GBP	1161.400411	1132.103058
CAD	619.531308	603.393408
CHF	777.24316	757.423256

Please rate the website you have just seen based on **visual appeal**.

very
unappealing

A horizontal row of eight small, empty circles, evenly spaced, used for rating the visual appeal of a website.

very
appealing

Popular Rwandan Website

The screenshot shows the homepage of The People's Bank (BPR) website. At the top, there is a navigation bar with links for RETAIL BANKING, BUSINESS BANKING, RURAL BANKING, SERVICES, ABOUT BPR, and CONTACT US. A search bar is located in the top right corner. The main banner features a yellow background with the text "KEEP TRACK OF YOUR ACCOUNT ON THE GO. WITH SMS & EMAIL ALERTS" and an image of hands typing on a keyboard. Below the banner, there are three promotional boxes: one showing a couple with a car key, another showing a hand holding a smartphone displaying a bank app, and a third showing two people using ATMs. At the bottom, there are sections for LATEST NEWS, EXCHANGE RATES, and a TARIFF GUIDE.

THE PEOPLE'S BANK
Banki yacu, Hafi yacu.

RETAIL BANKING BUSINESS BANKING RURAL BANKING SERVICES ABOUT BPR CONTACT US

Enter keyword here...

KEEP TRACK OF YOUR ACCOUNT ON THE GO.
WITH SMS & EMAIL ALERTS

You want to acquire your first drive? [Learn More](#)

Carry your bank with you 24/7 [Learn More](#)

Simple things that make life easier. **SEND iZi CASH**

LATEST NEWS

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Banque Populaire du Rwanda

Tariff Guide

EXCHANGE RATES

Currency	Selling	Buying
USD	696.824572	679.824572
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GBP	1161.400411	1132.103058
CAD	619.531308	603.393408
CHF	777.24316	757.423256



2068991
total participants



Trust us; you will love this test!

Take this test to see how well you can spot (un)trustworthy websites. This experiment takes around 12 minutes.

[Participate now!](#)

How fast is your memory?

See how quickly you can retrieve information you have just memorized. This experiment takes around 10 minutes.

[Participate now!](#)

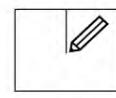
What is your website aesthetic?

Compare your visual preferences to people around the world. This experiment takes around 10 minutes.

[Participate now!](#)

Test your social intelligence!

Test how well you can read emotions of others just by looking at their eyes. This experiment takes around 10 minutes.

[Participate now!](#)

Are you more Eastern or Western?

In this test, you will learn whether you are more sensitive to a focal object (as most Americans) or more attuned to the context (as many Japanese). This experiment takes around 8 minutes.

[Participate now!](#)

Looking for more studies?

We have joined forces with [TestMyBrain](#) and [GamesWithWords!](#) Learn about your brain, test your language sense, and participate in other studies on [LessWeird.org](#).

News From The Wild

April 25, 2014

During the summer, we launched an experiment to examine graph prediction tendencies amongst different cultures, particularly the contrast be...

[Read more](#)

March 20, 2014

How do you feel about Naver.

[Read more](#)

Why Participate?

LabintheWild provides you with personalized feedback, letting you compare yourself to people of other countries.

By participating, you contribute to research on people's similarities and differences around the world when interacting with technology.

Join the Wilderness



Enter your email to find out about new studies and breakthrough results:

[Notify me!](#)

Large Scale Data Collection

The screenshot shows the homepage of the Lab in the Wild website. At the top right, it displays "2068991 total participants". Below this, there are several experiment cards with "Participate now!" buttons. One card, titled "What is your website aesthetic?", has a red circle drawn around its thumbnail image. In the bottom left, there's a news section for "News From The Wild" dated April 25, 2014, and a "Why Participate?" section. On the right, there's a "Join the Wilderness" form.

Our Experiments | About Us | Blog | English ↴

LABINTHETWILD

2068991 total participants

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[Notify me!](#)

2.4 million ratings
39,975 participants
430 websites

Visual Feature Analysis



2.4 million ratings
39,975 participants
430 websites

39 image metrics
describing website
perceived **colorfulness**
and **complexity**

Age, country,
gender, education

Plotting Appeal by Complexity



POCCUO

ABOUT US

WHAT WE DO

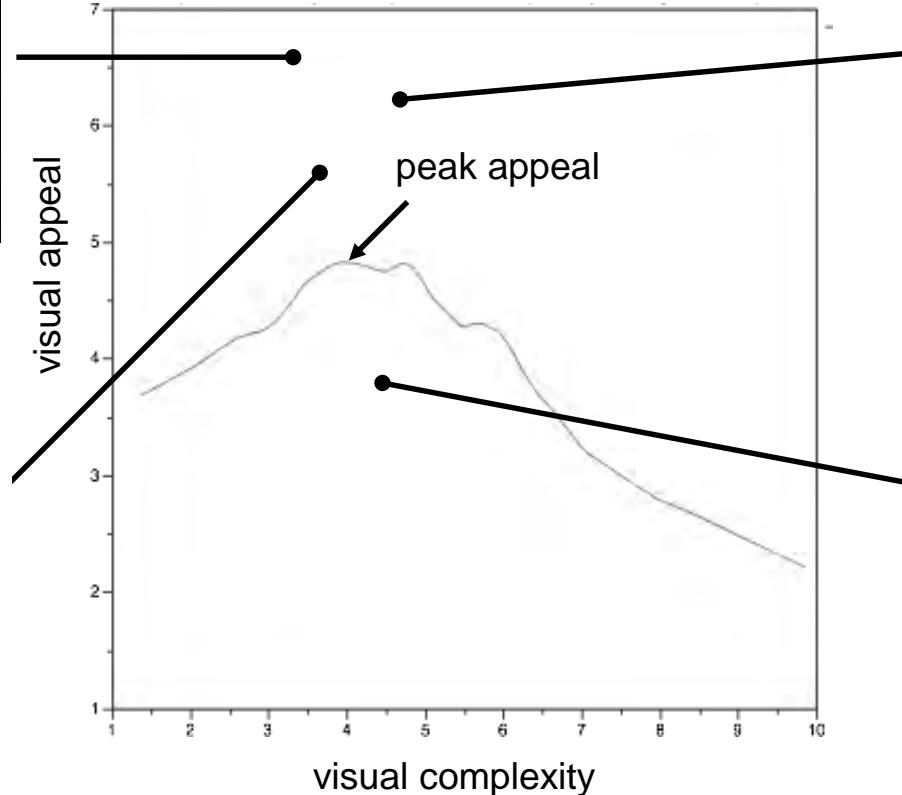
OUR WORK

THE LATEST

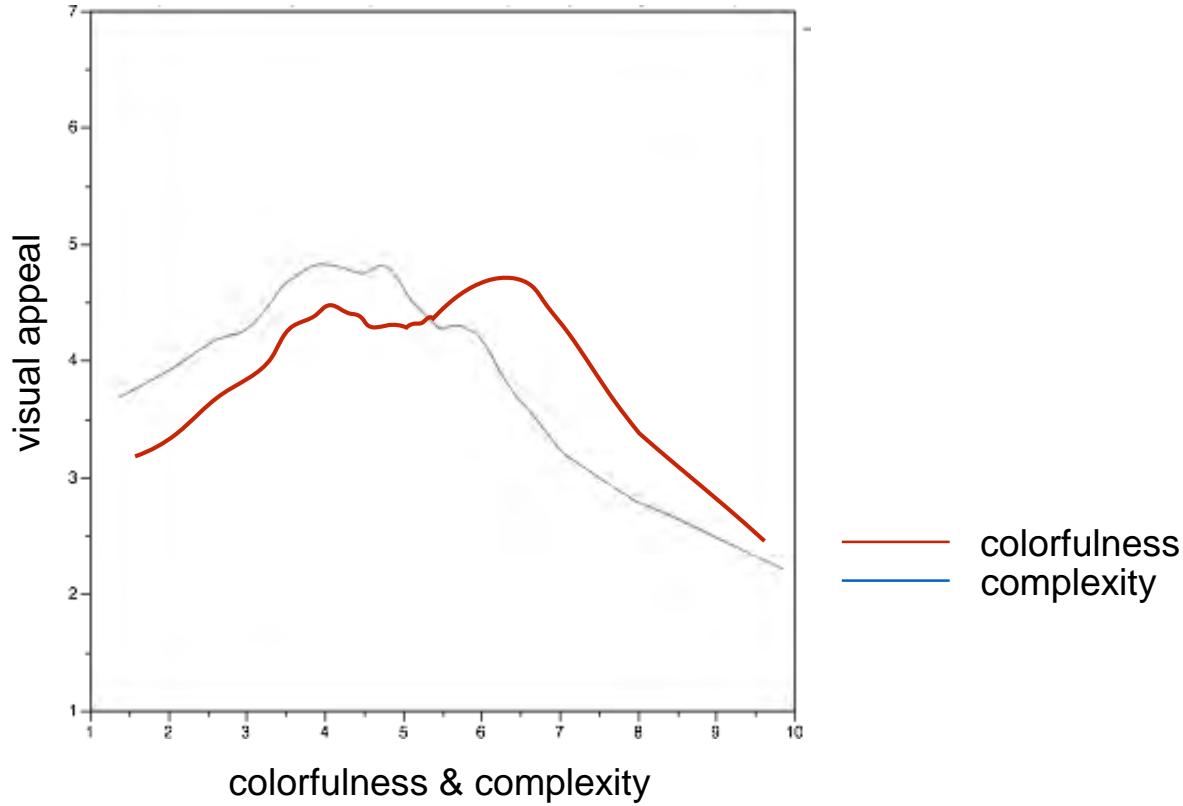
CONTACT US

It's a July morning. Mason is front-end-developing, Phil is conference-calling, and Kim is website-updating.

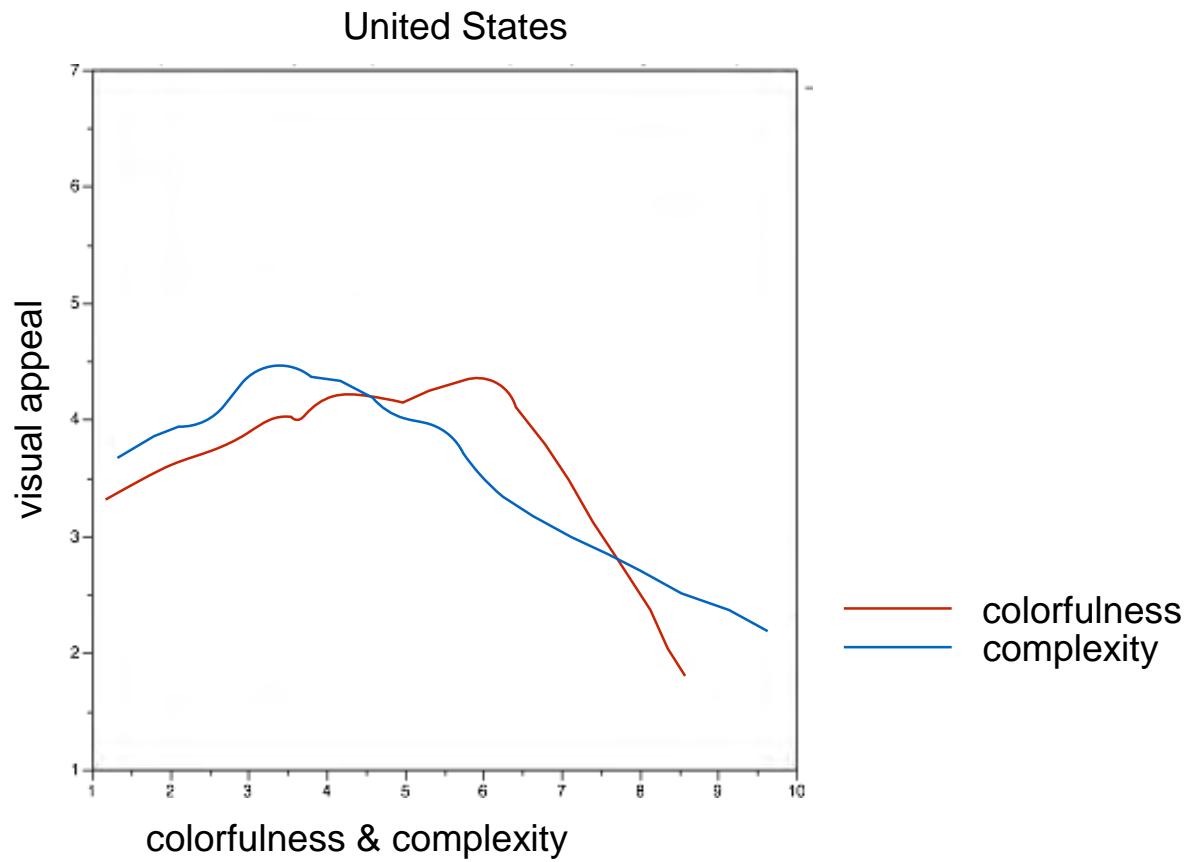
from Poccuo's Twitter



Plotting Appeal by Colorfulness



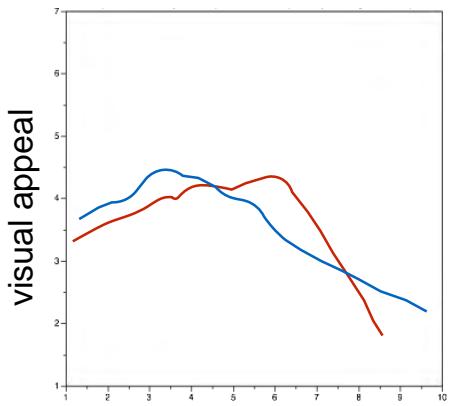
United States



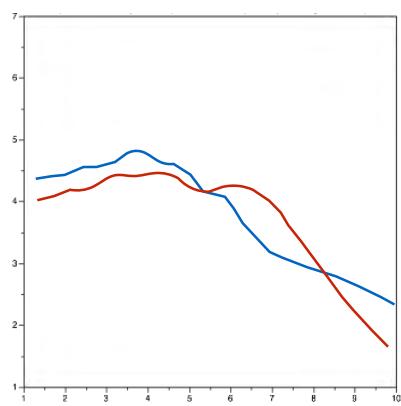
Other Countries

— colorfulness
— complexity

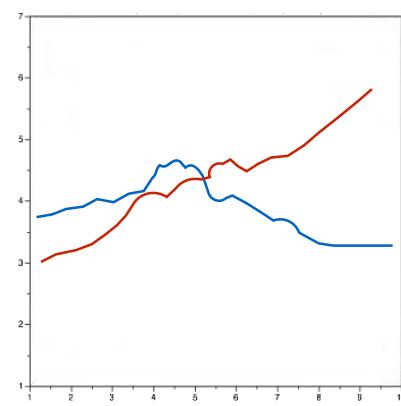
United States



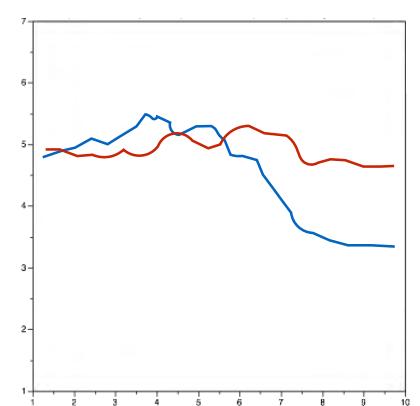
Germany



Macedonia



Hong Kong

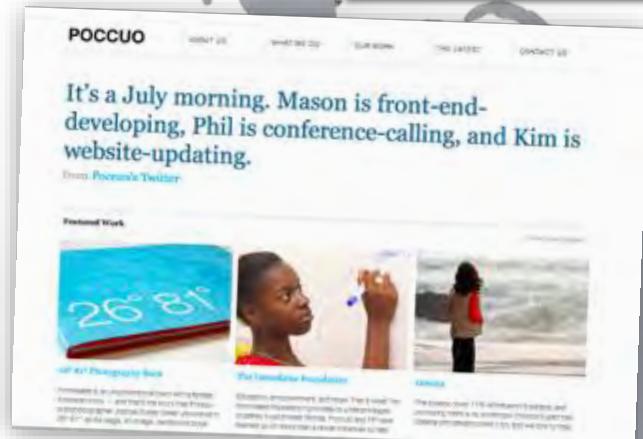


colorfulness & complexity



The screenshot shows the Poccuo website. At the top, there is a navigation bar with links like 'ABOUT US', 'WHAT WE DO', 'OUR WORK', 'THE TEAM', and 'CONTACT US'. Below the navigation, a news article is displayed with the following text:
It's a July morning. Mason is front-end developing, Phil is conference-calling, and Kim is website-updating.
From [Poccuo's Twitter](#).

Below the news article, there is a section titled 'Featured Work' with three thumbnail images: a blue graphic design, a woman writing on a whiteboard, and a person standing on a beach. Each thumbnail has a title: '26.81 Photography Back', 'The Unsolvable Problem', and 'Coming Soon'.



Reinecke and Gajos, CHI 2014

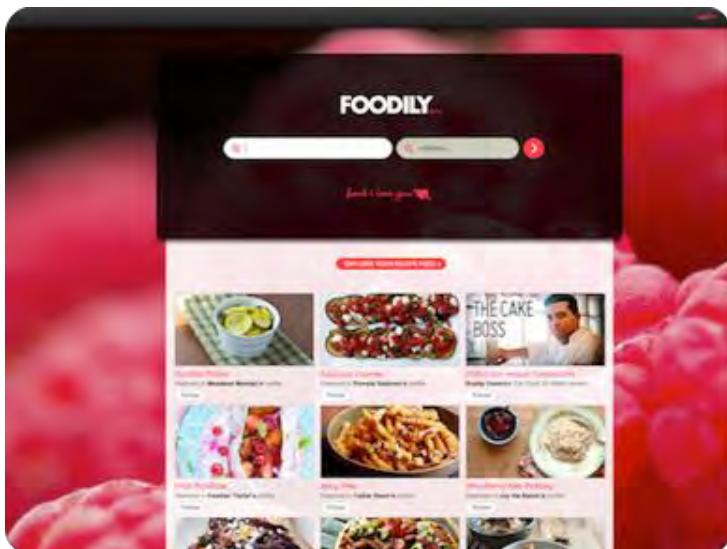


Reinecke and Gajos, CHI 2014

> 50
years



< 20
years



female

The Tree of Life web project (TOL) is a collaborative effort of thousands and nature enthusiasts from around the world. It contains information about a particular group, e.g., *Acanthoceras*, segmented worms, *Urticaceae*, *Hymenoptera*, *Hesperomeles*, *Pseudoscorpions*, *Fungi*, or the *Vampire Squid*. TOL pages are linked over 100 million times per month, making it one of the most frequently visited sites on the web. By linking every living creature to its individual record, the TOL project thus facilitates the general connection between all living things.

This is a blog post by artist Whitney. She discusses her passion for making pottery and how it has evolved over time. She also mentions her upcoming events and a link to her website.

male

What do you want to learn today? treehouse is the easy way to learn how to design and develop for the web and iOS.

Web Design
Web Development
iOS Development

Anobii is a social network for book lovers. It allows users to share their reading lists, find new books, and connect with other book enthusiasts. Recent activity includes posts from users like "Anon" and "Arianna".

Abandoning “One Best Design”

People have different preferences

We can study these preferences

We can even predict these preferences

A design that emphasizes one preference will generally disadvantage some other preference

Not always, because software is malleable

How should we think about differences

One powerful viewpoint is social justice

Accessibility is the Law

National Federation of the Blind vs. Target, 2006
Americans with Disabilities Act, 1990

Requires accessibility in employment, public entities and public transportation, public accommodations and commercial facilities

Rehabilitation Act, 1973

Section 508, 1998

Mandates federal procurement of accessible electronic and information technologies

Universal Design vs. Assistive Technology



Personal Texting by Deaf People



Teletypewriter (TTY)
used by deaf people
in their homes circa 1970



1990s TTY with
built-in acoustic modem



SMS texting

People with Disabilities

1 billion people worldwide

15% of the population

50 million people in US

Including yourself if you
are fortunate to live to
develop disabilities

A Social Justice Problem

1 billion people worldwide

15% of the population

50 million people in US

16% of people in the US
10% of workforce
5% of STEM workforce
1% of PhDs in STEM

Including yourself if you
are fortunate to live to
develop disabilities

Current State of Devices



Slide Rule, Kane et al, ASSETS 2008

Apple VoiceOver

Equal Access to Information

Is this access equal?

Equal Access to Information

Is this access equal?

Some dimensions to consider

Cost

Speed

Accuracy

Ease

It simply being possible is not enough

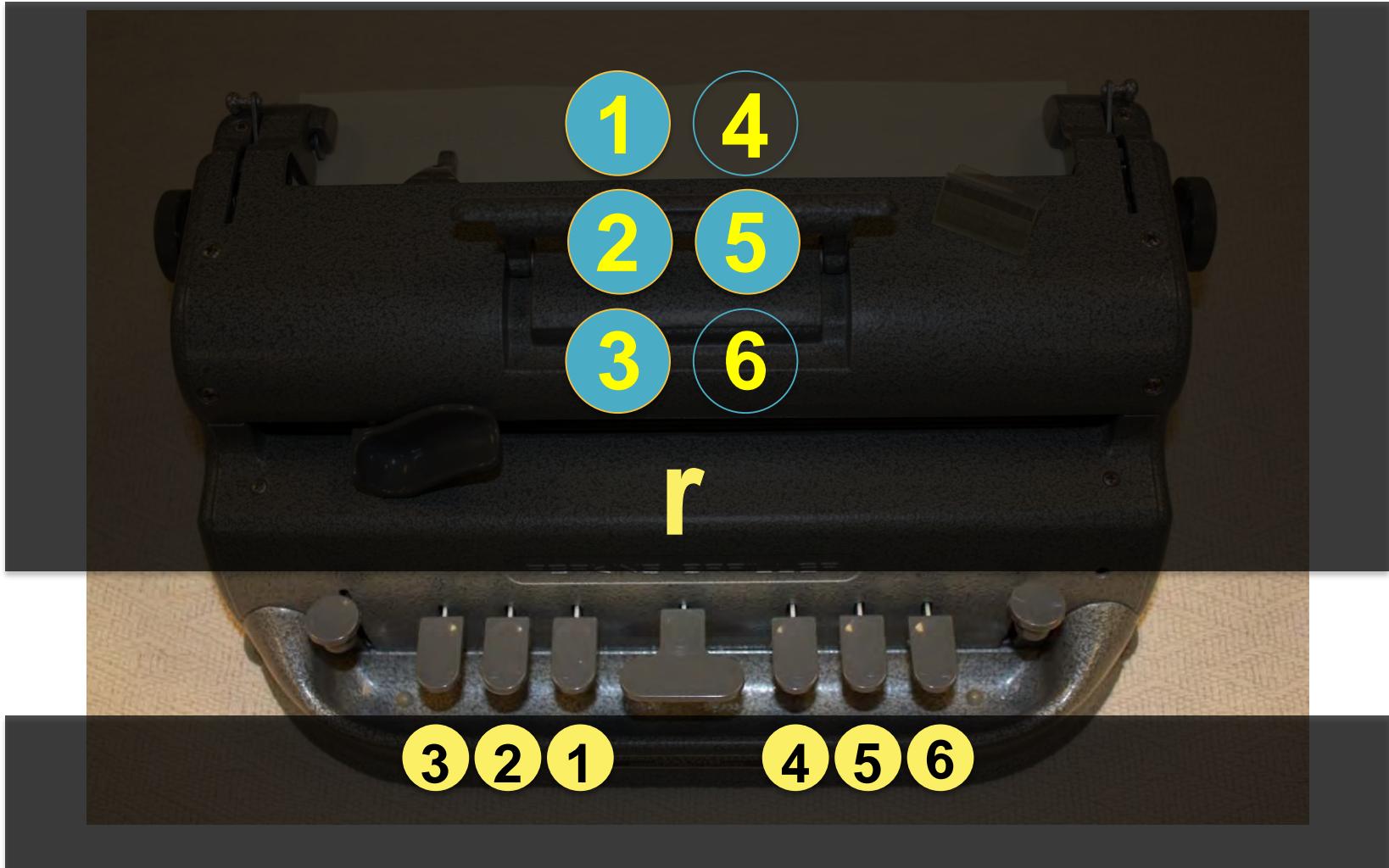
A Closer Look at Text Entry



Contrast with Braille Input



Contrast with Braille Input



Ability-Based Design

States that all interfaces make assumptions about the abilities needed to use them

Any one-size-fits-all design is therefore inaccessible to many people

Instead of asking people to struggle to adapt, asks that interfaces adapt or be adaptable to match the abilities of each person

Perkinput



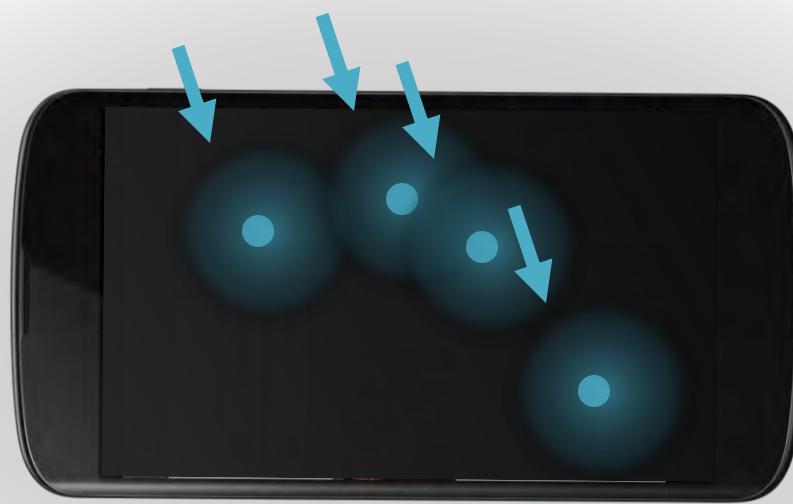
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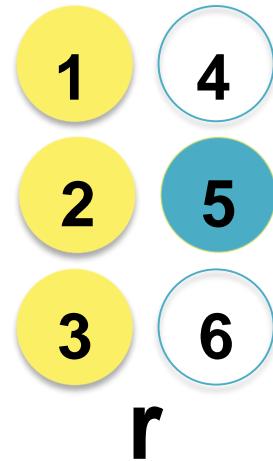
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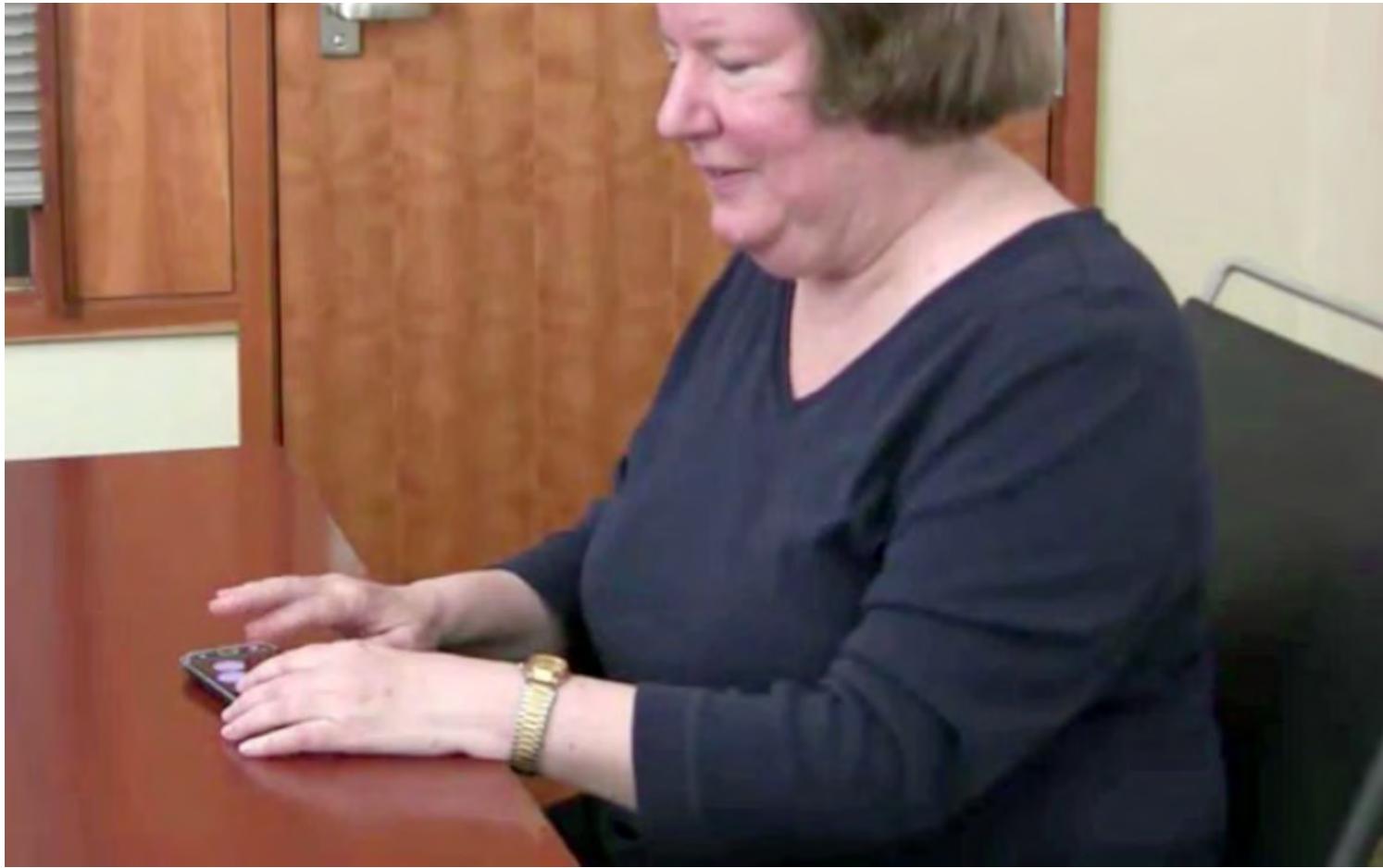
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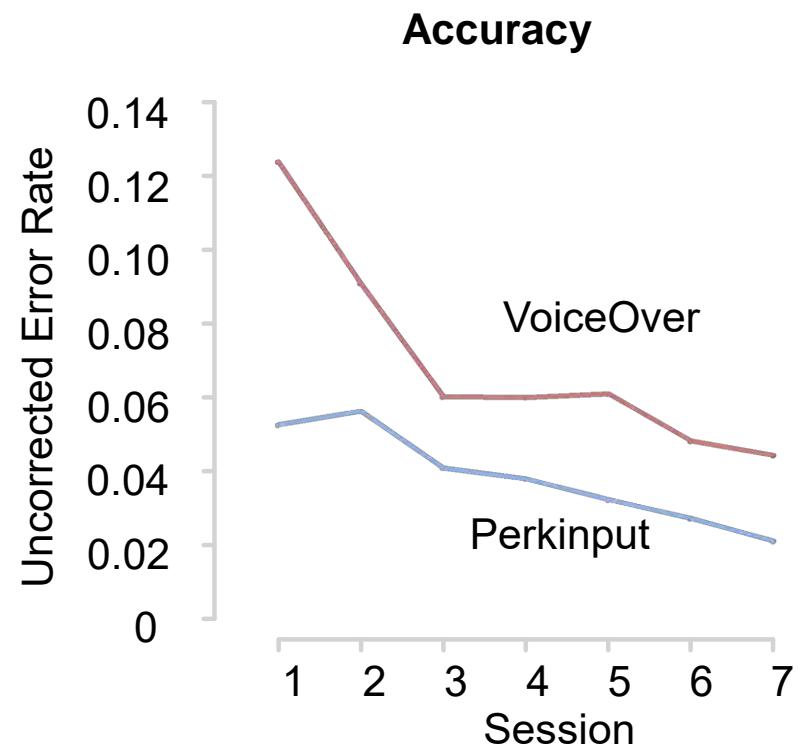
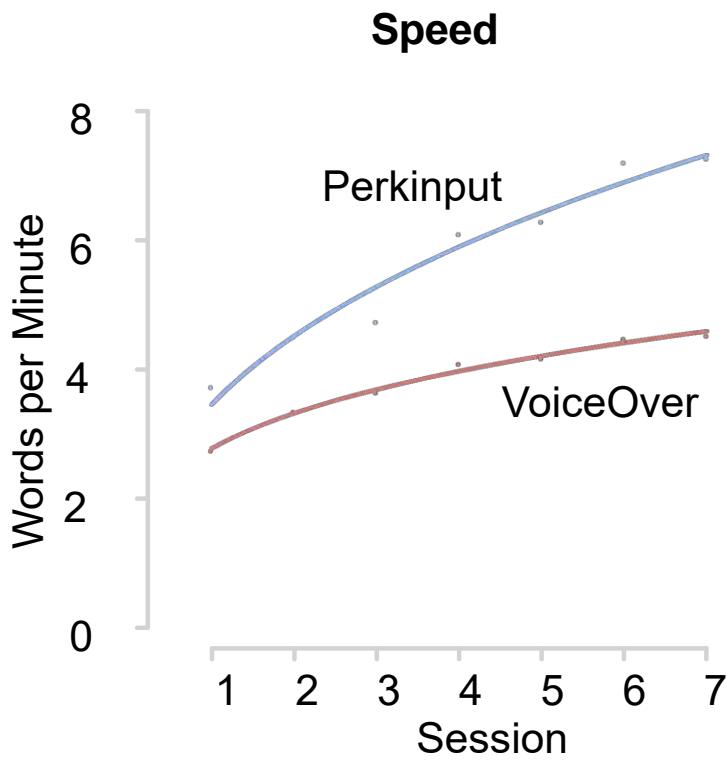
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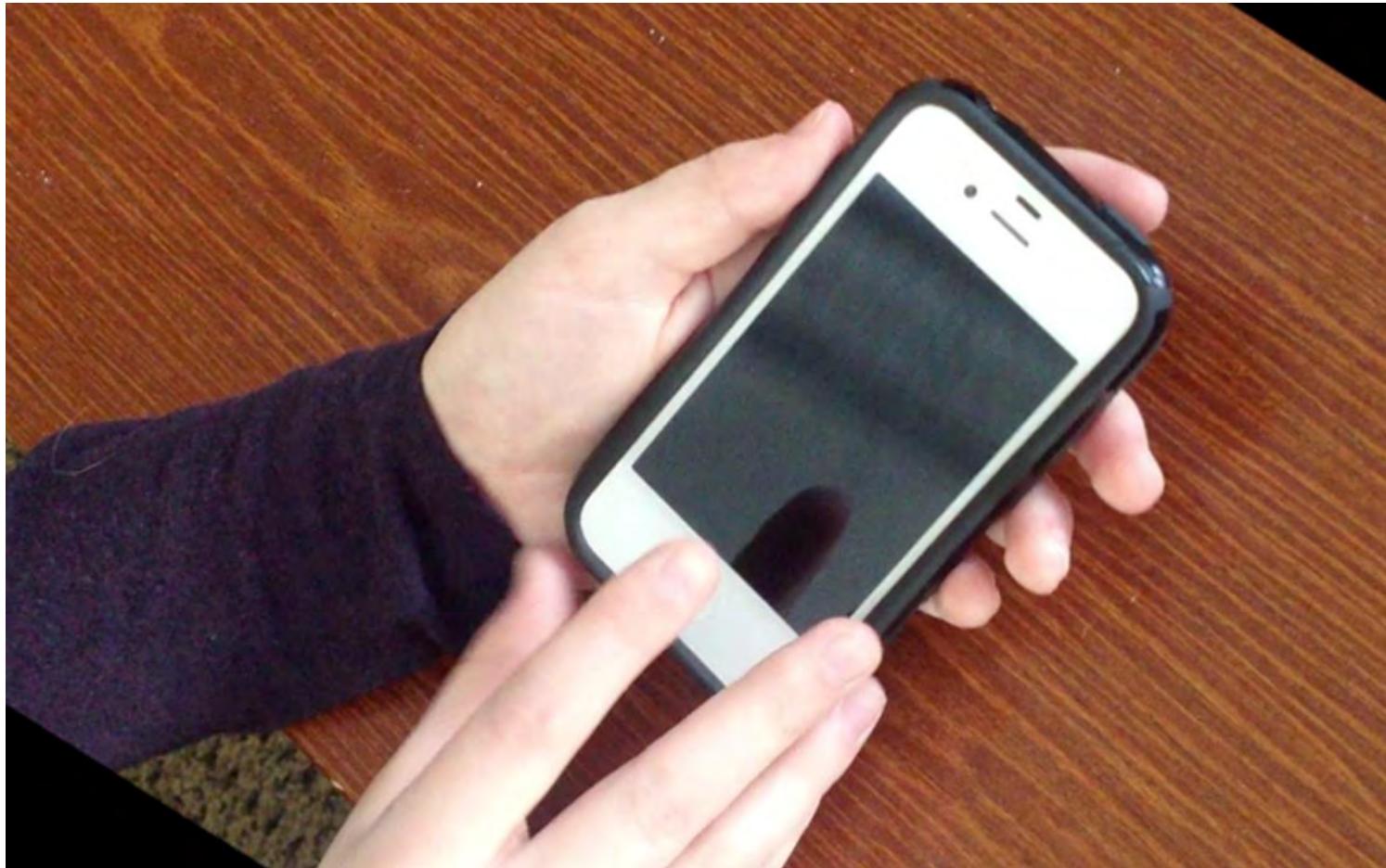
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Speed and Accuracy



Another Problem



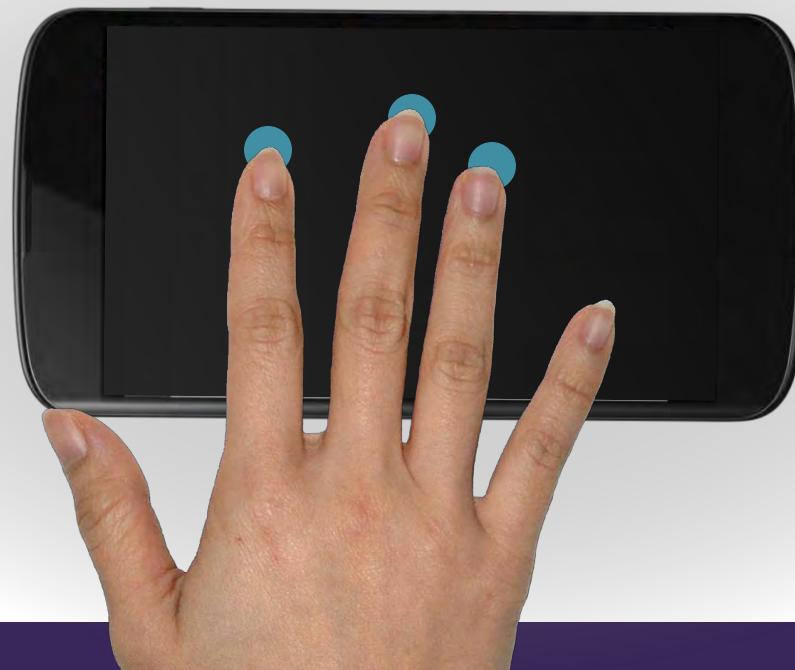
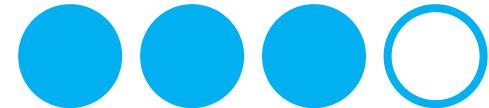
PassChords



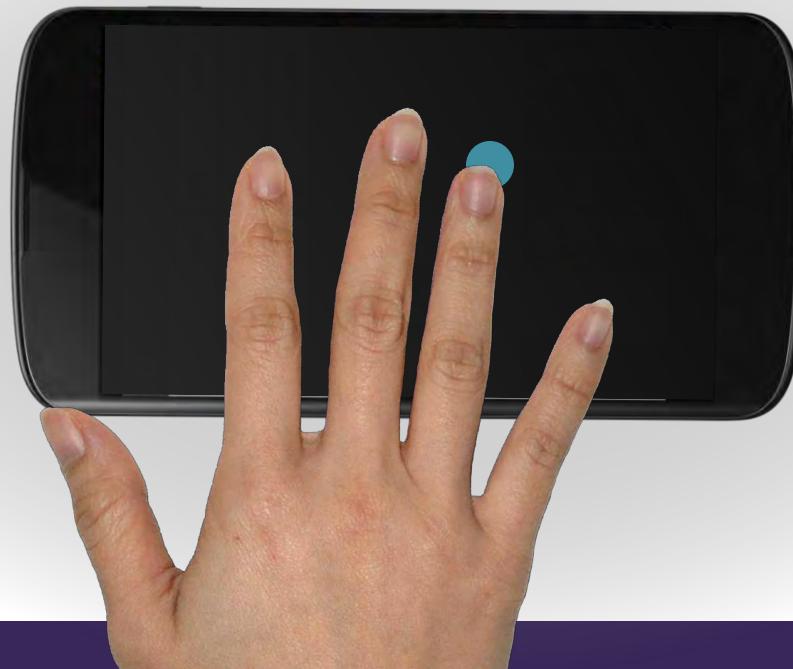
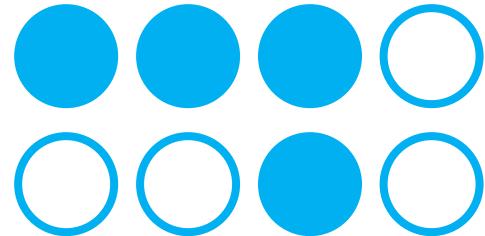
PassChords



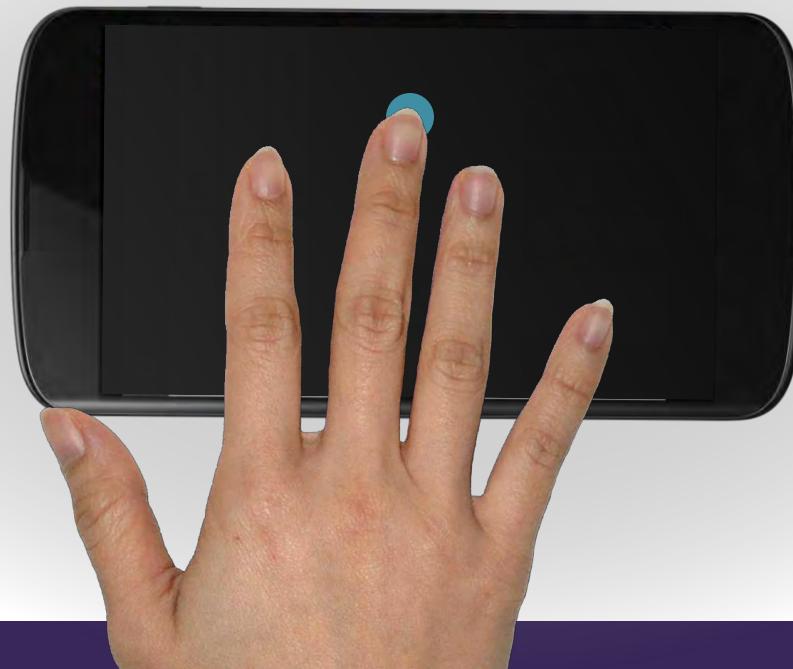
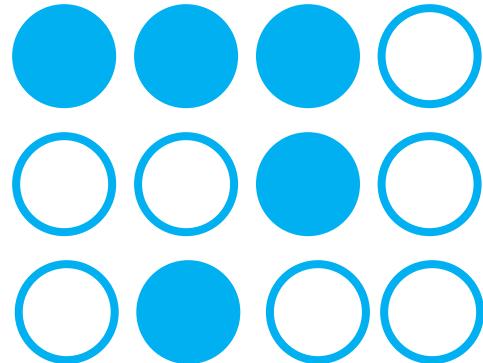
PassChords



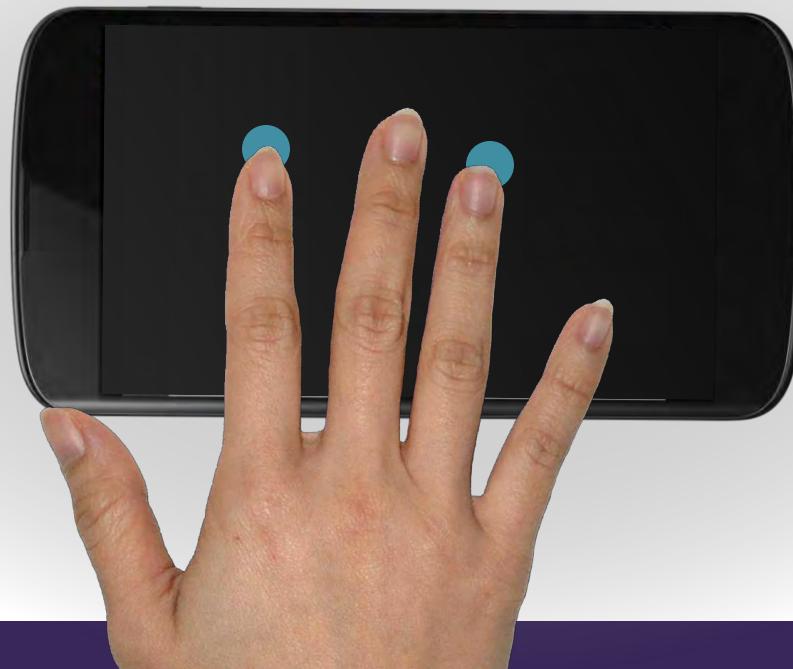
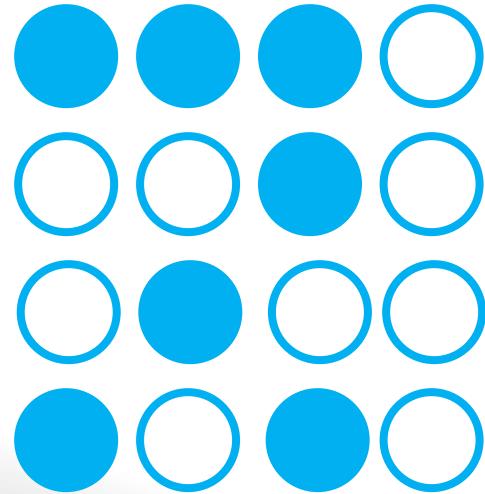
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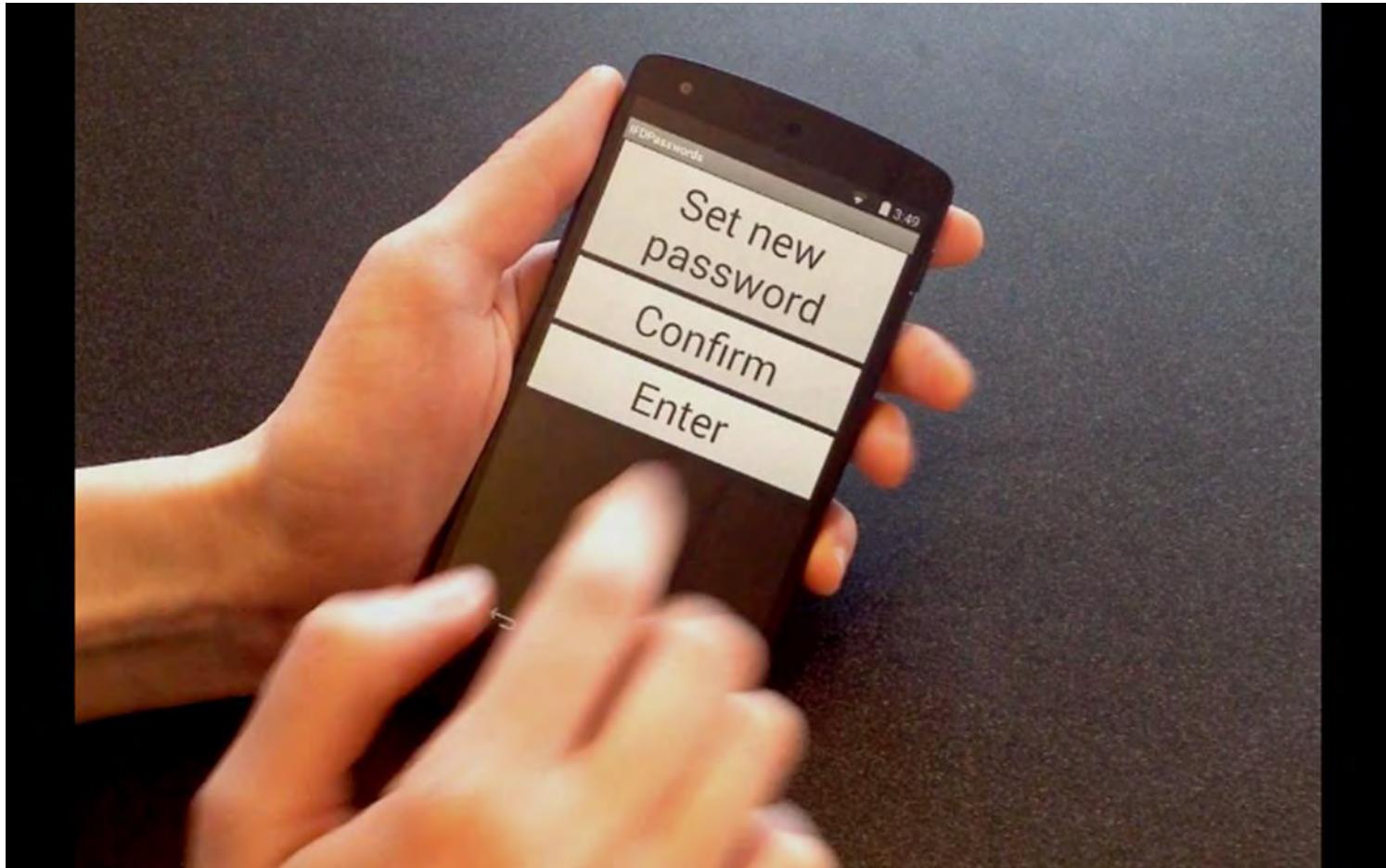
PassChords



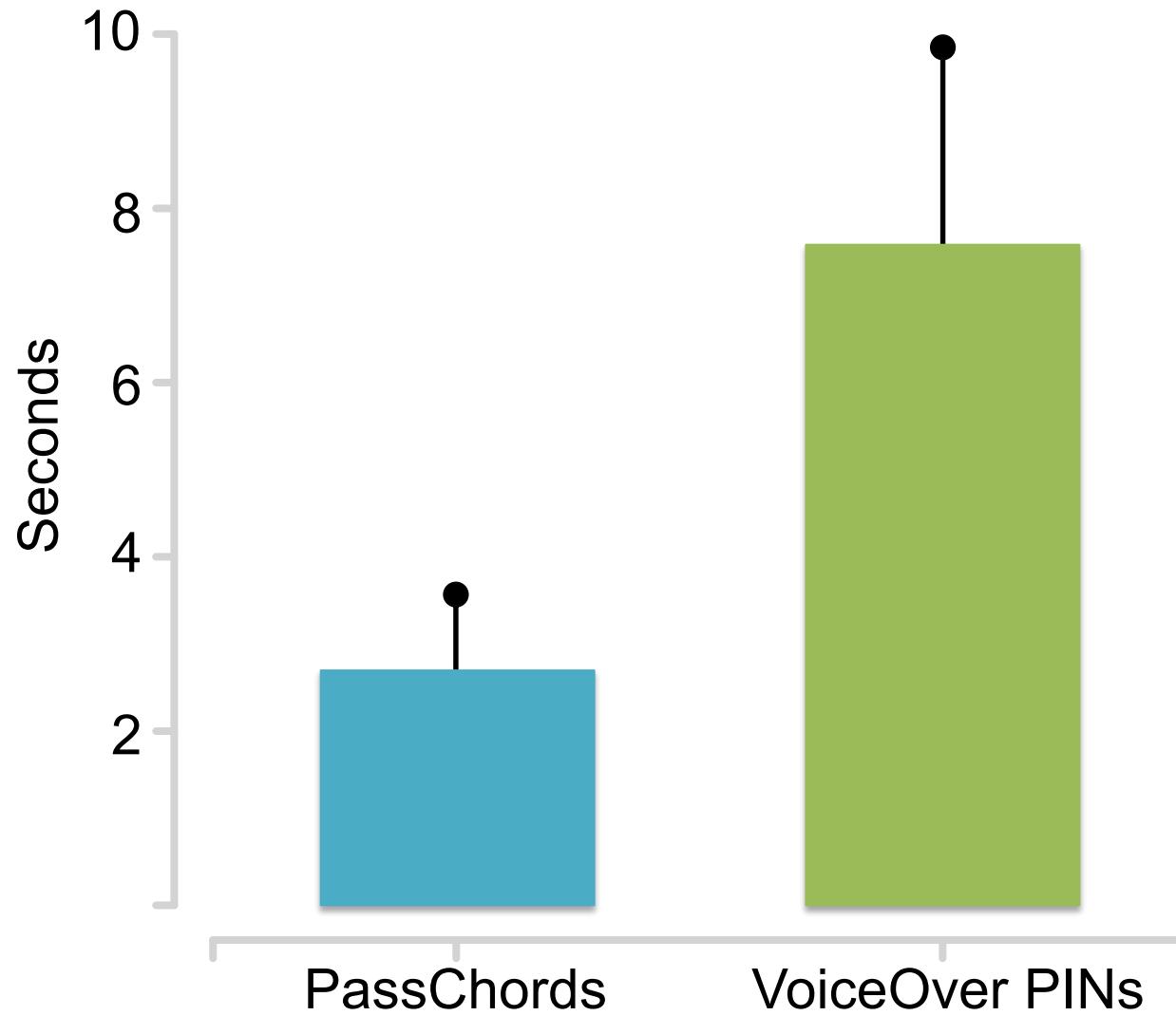
PassChords



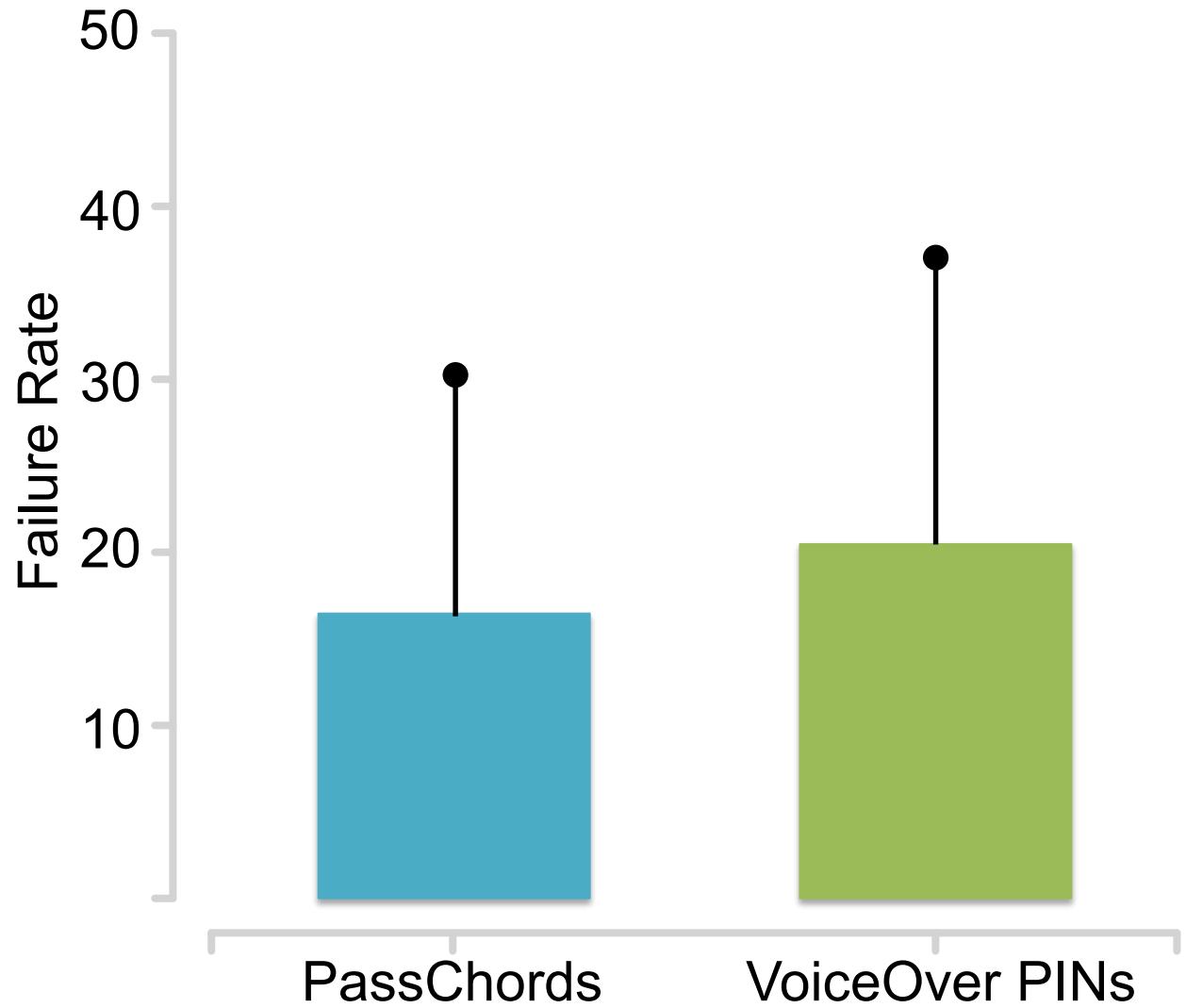
PassChords



Time to Authenticate



Accuracy



What About Security?

What About Security?

One measure is Entropy

The minimum number of bits needed to encode
the set of all possible passwords

4-digit PINS: 13.3 bits

What About Security?

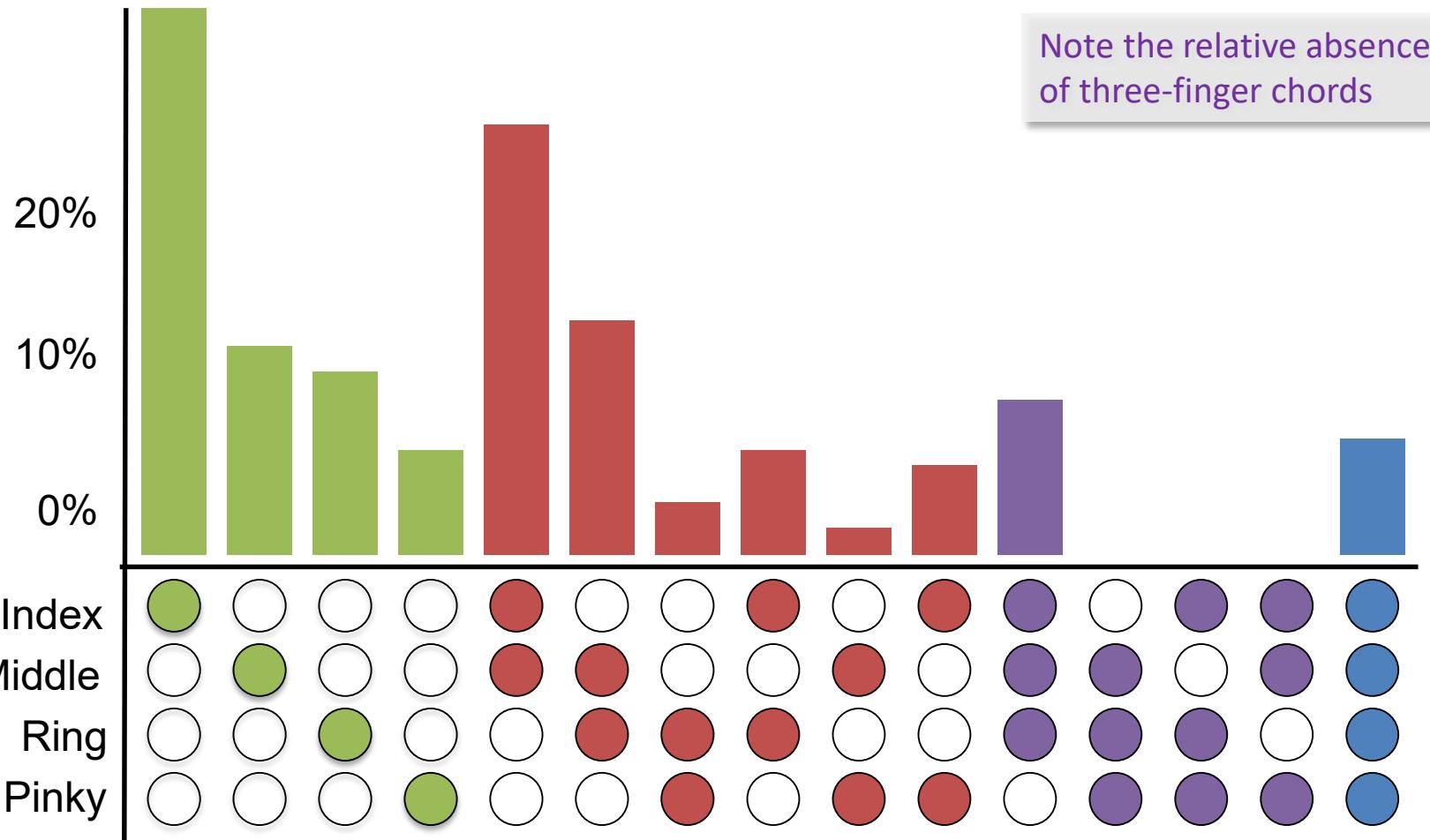
A better measure is Guessing Entropy

The minimum number of bits needed to encode
the number of guesses given distribution

4-digit PINS: 12.7 bits

Not all PINS are equally likely

Finger Pattern Frequency



What About Security?

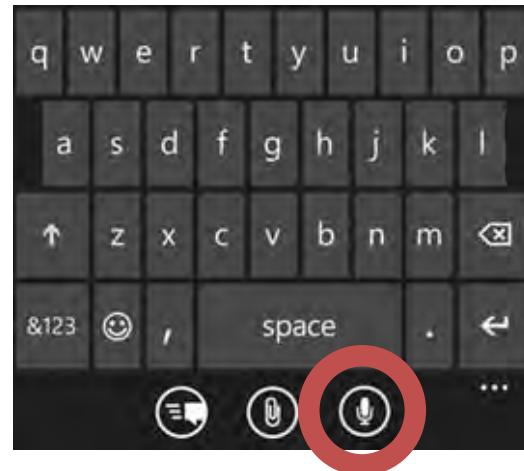
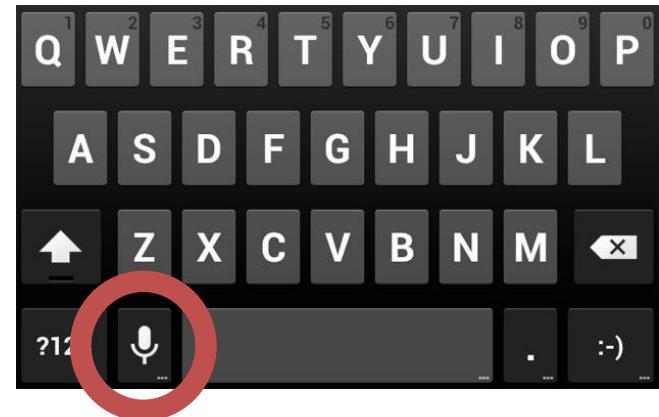
A better measure is Guessing Entropy

The minimum number of bits needed to encode
the number of guesses given distribution

4-digit PINS: 12.7 bits

4-tap PassChords: 12.6 bits

Speech Input



Reviewing Errors and Edits

When of my hobbies is hiking.

I really **enjoyed** getting away...

The triangle **consist** of a **2 mile** hike to the beach, **I three-mile** hike along the beach, and a **2 mile** hike back.

It is a very common hike, but **I knew** to the **northwestern if you** like I need to do it.

Serial Access in Reviewing Transcript

When

Serial Access in Reviewing Transcript

of

Serial Access in Reviewing Transcript

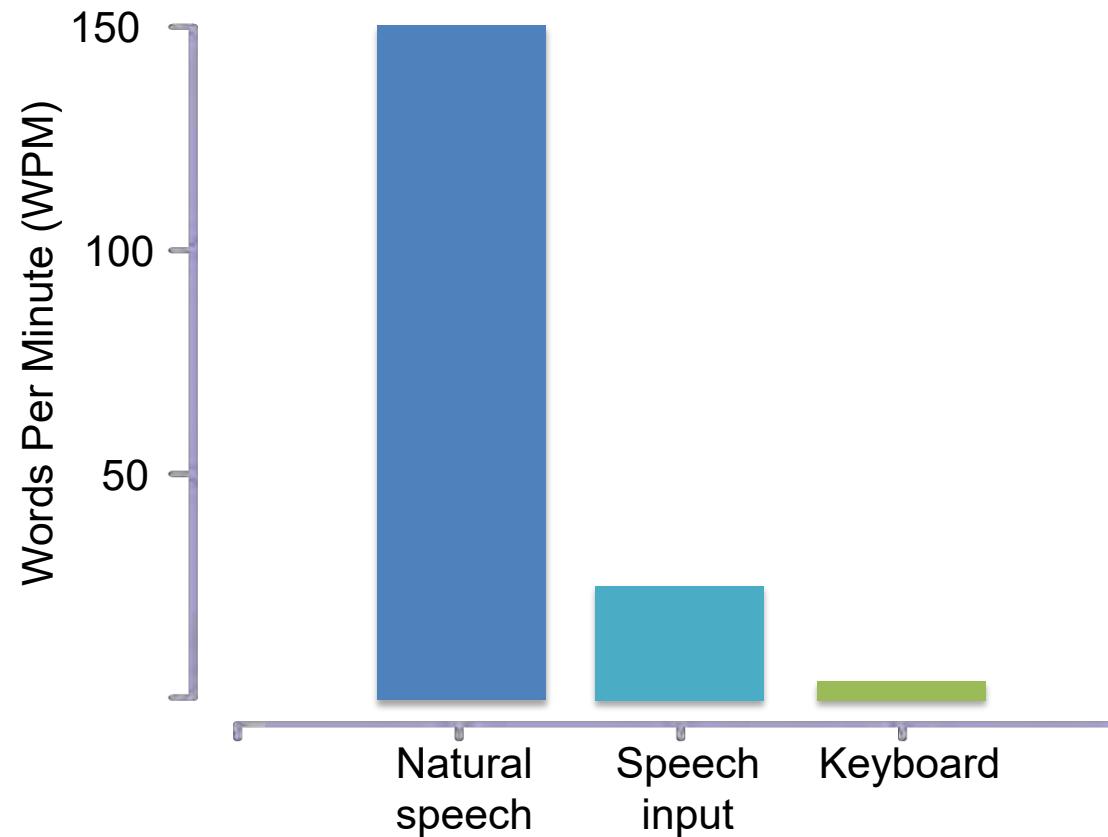
my

Serial Access in Reviewing Transcript

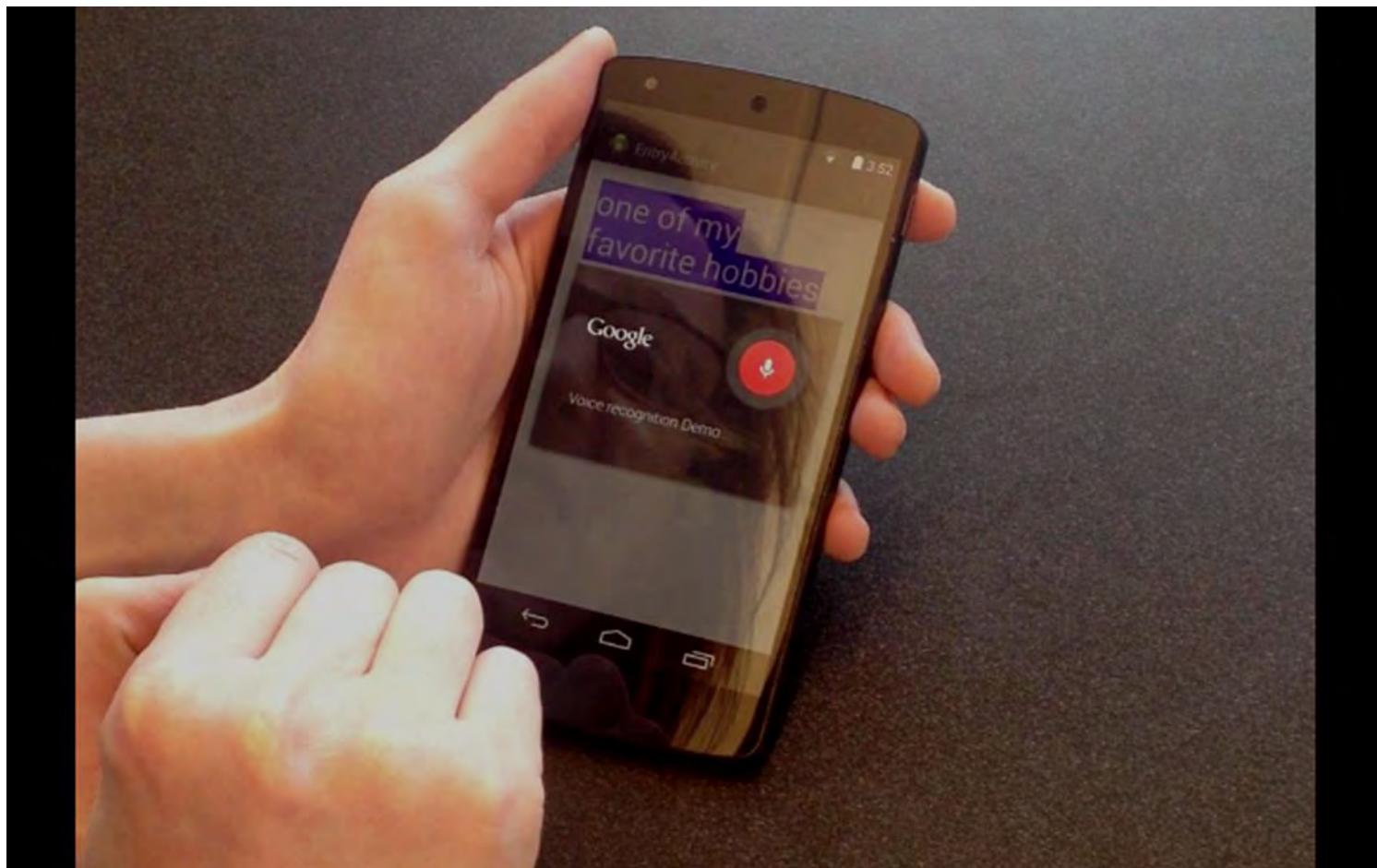
hobbies

Reviews and Edits

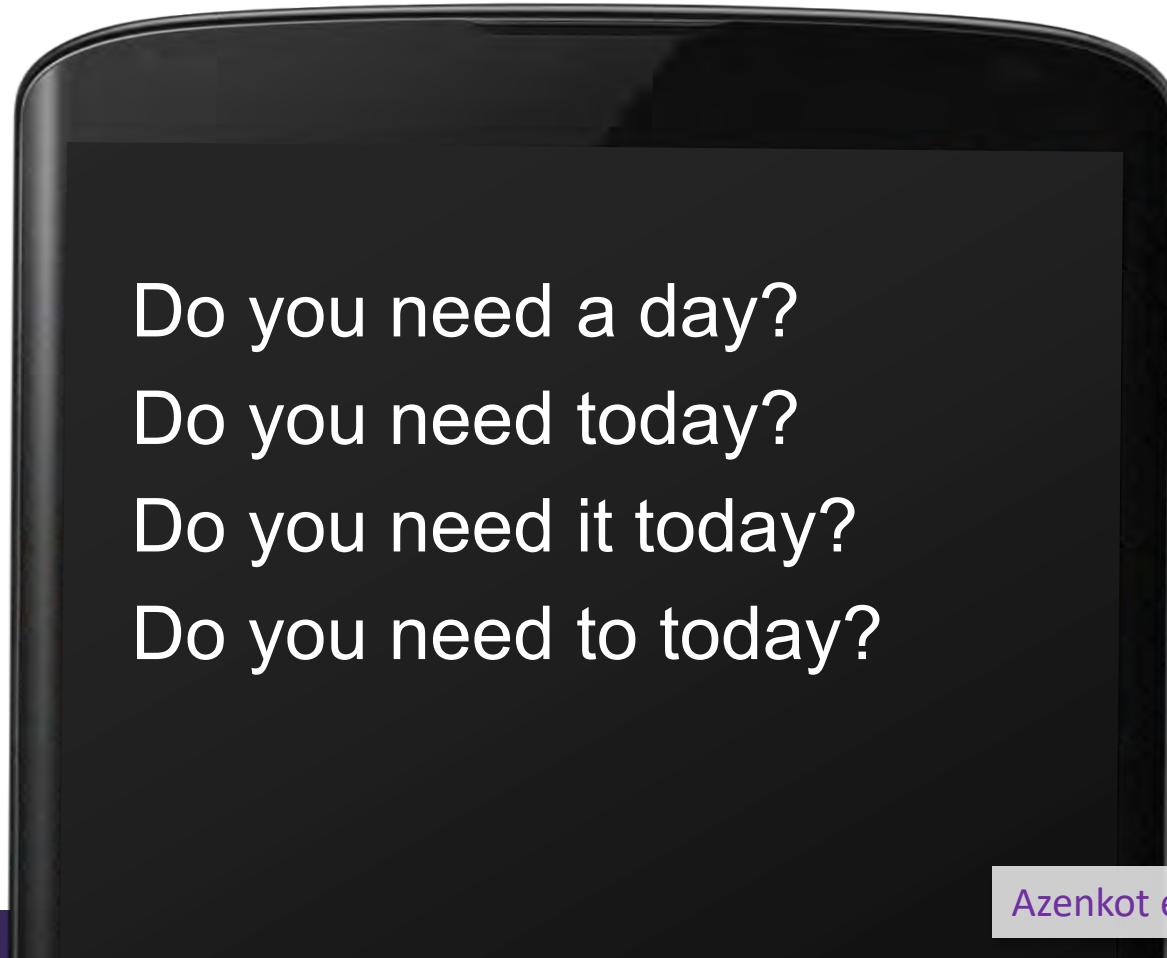
80% of composition time in review and edits



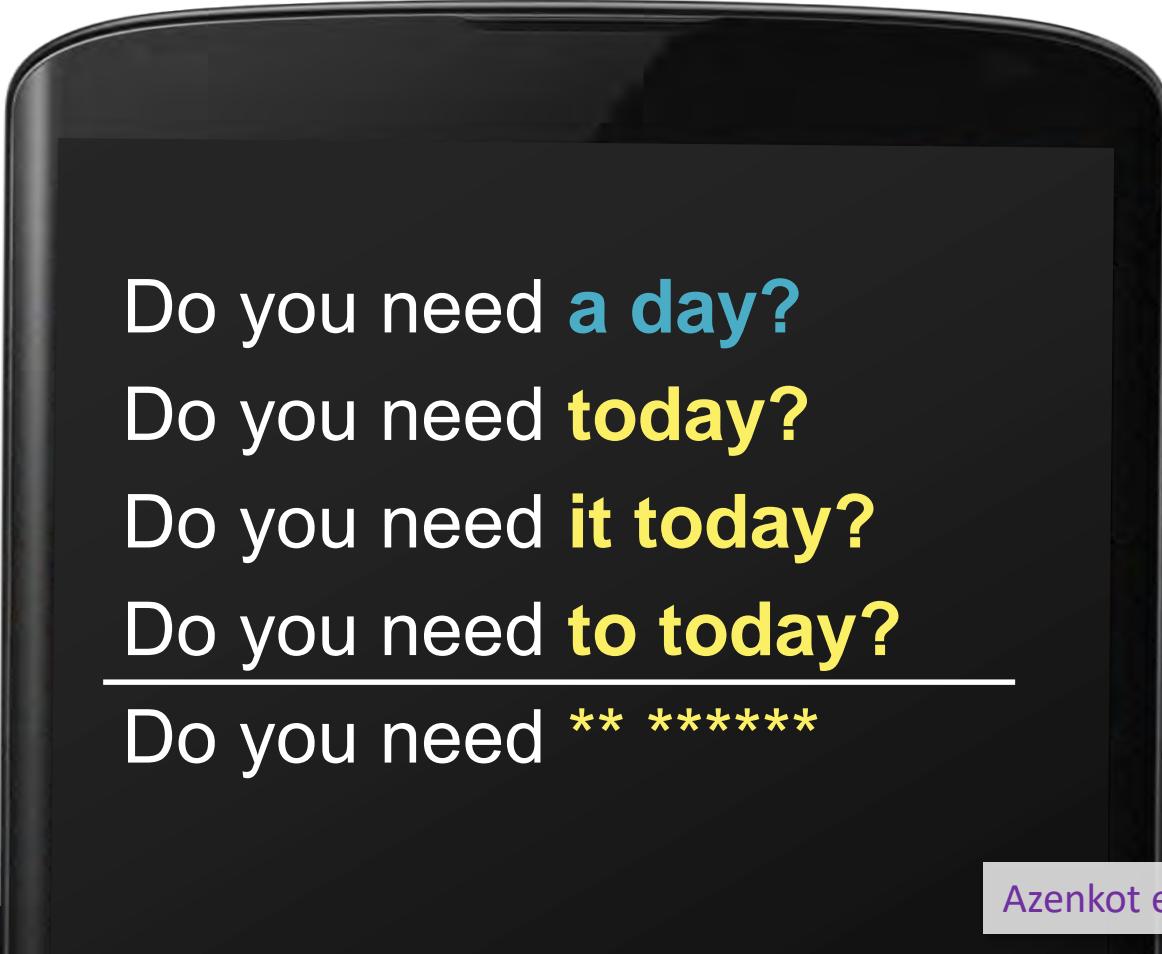
Spifi



Recognize Speech as N-best List

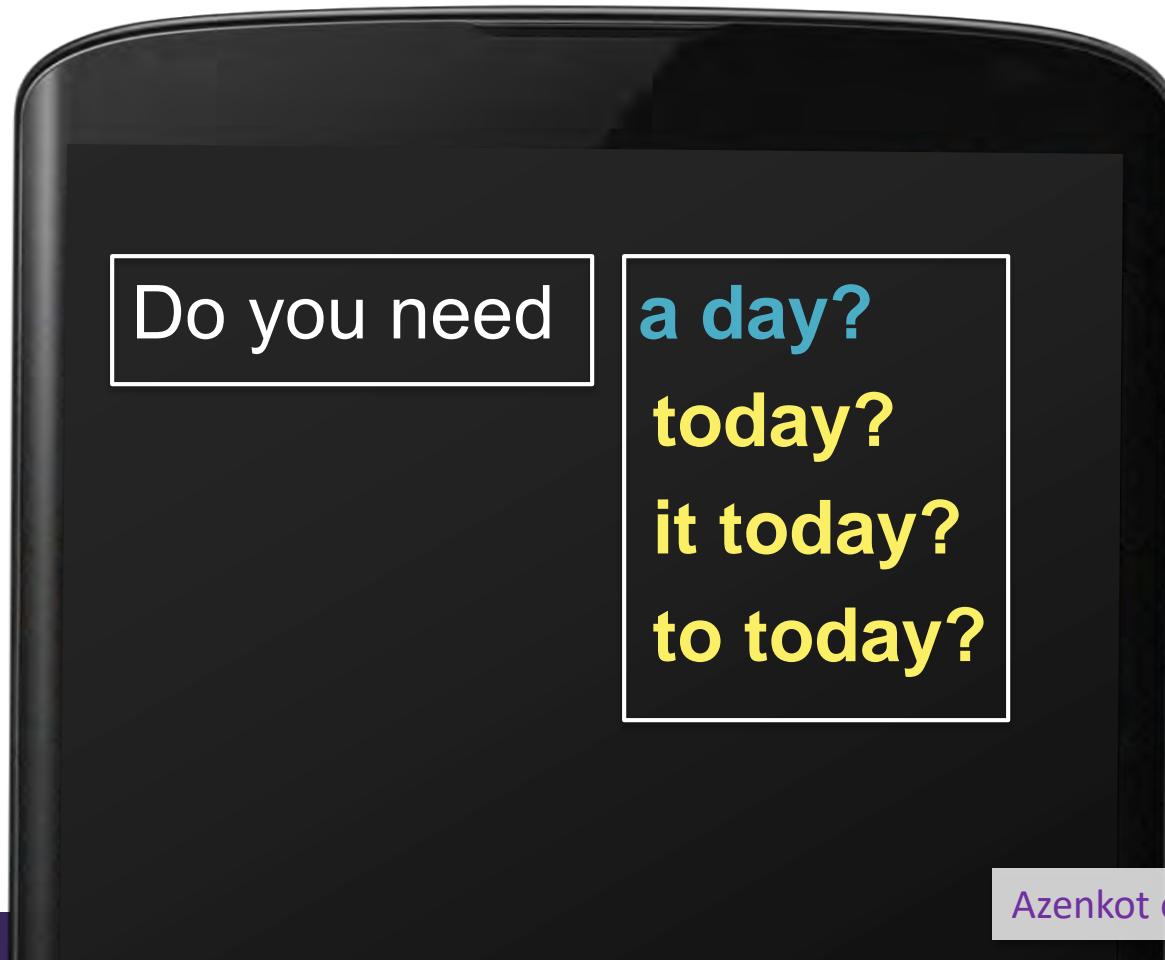


Find Uncertain Words



Do you need **a day?**
Do you need **today?**
Do you need **it today?**
Do you need **to today?**
Do you need ** *****

Split Into Phrases and Align Alternatives



Accessibility is More than Text Entry

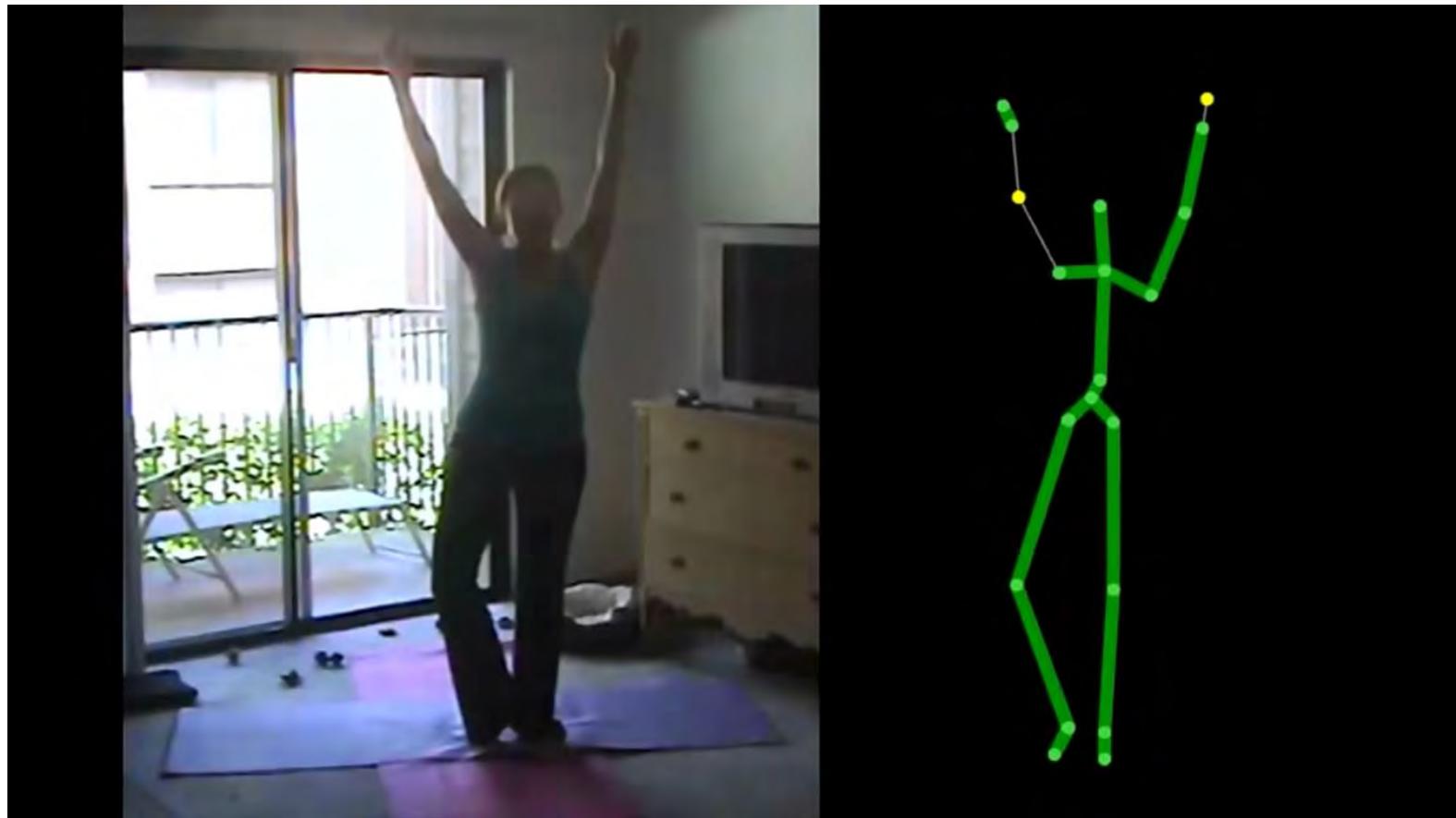


“Sometimes you don’t follow along as well unless [you are] one on one.”

Accessibility is More than Text Entry



Accessibility is More than Text Entry



Accessibility is More than Text Entry



OneBusAway

Home Tools Research Contact Us Settings

NW MARKET ST & BALLARD AVE NW
Stop # 18120 - E bound

route	destination	minutes
18	DOWNTOWN SEATTLE 03:54 - departed 2 mins late	-3
44	UNIVERSITY OF WASHINGTON MEDICAL CENTER 03:55 - scheduled departure	-3
17	DOWNTOWN SEATTLE 03:57 - departed 6 mins late	NOW
75	BALLARD 04:06 - 2 min delay	8
44	UNIVERSITY OF WASHINGTON MEDICAL CENTER 04:07 - on time	9
18	DOWNTOWN SEATTLE 04:13 - on time	15
44	UNIVERSITY OF WASHINGTON MEDICAL CENTER 04:19 - on time	21
17	DOWNTOWN SEATTLE 04:20 - on time	22
44	UNIVERSITY OF WASHINGTON MEDICAL CENTER WALLINGFORD 04:37 - 3 mins early	35

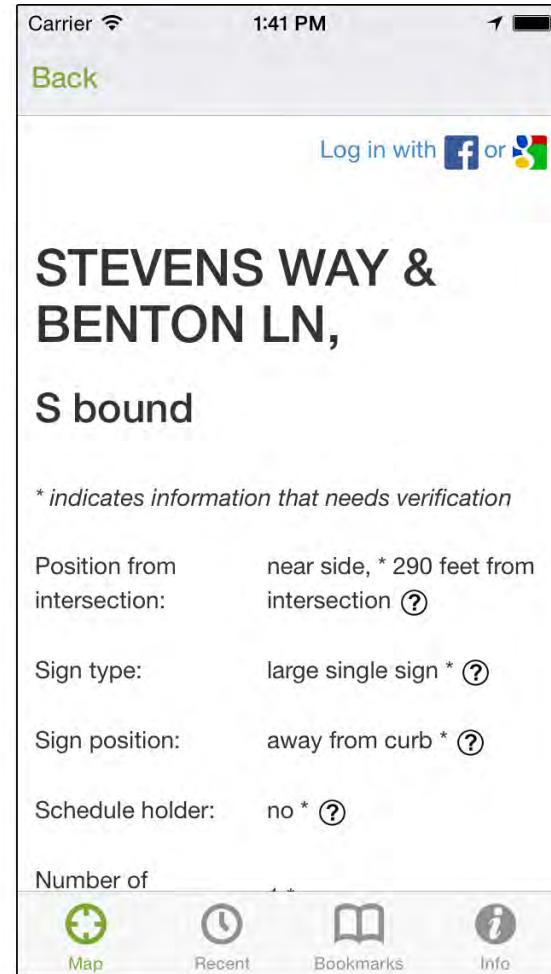
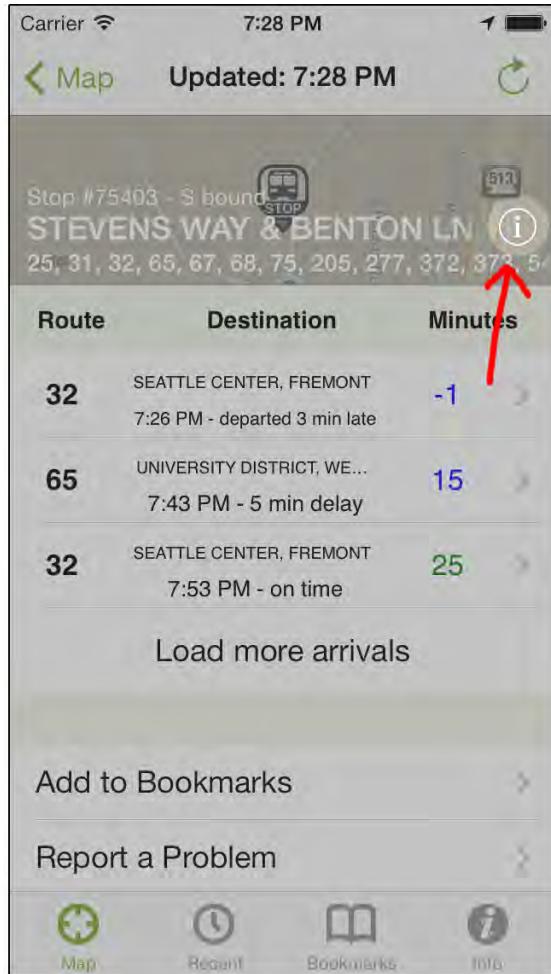
Last Update: 03:57 PM

Accessibility is More than Text Entry



How do you find a bus stop?

Accessibility is More than Text Entry



What is Disability?

The old model is medical, focused on the individual with a mindset of “fixing” an impairment

Current model understands disability is imposed by society and design not accounting for diversity

“Disability is thus not just a health problem.

...the interaction between features of a person’s body and features of the society in which he or she lives.

Overcoming the difficulties...requires interventions to remove environmental and social barriers.”

What is Disability?

Impairment

a problem in body function or structure

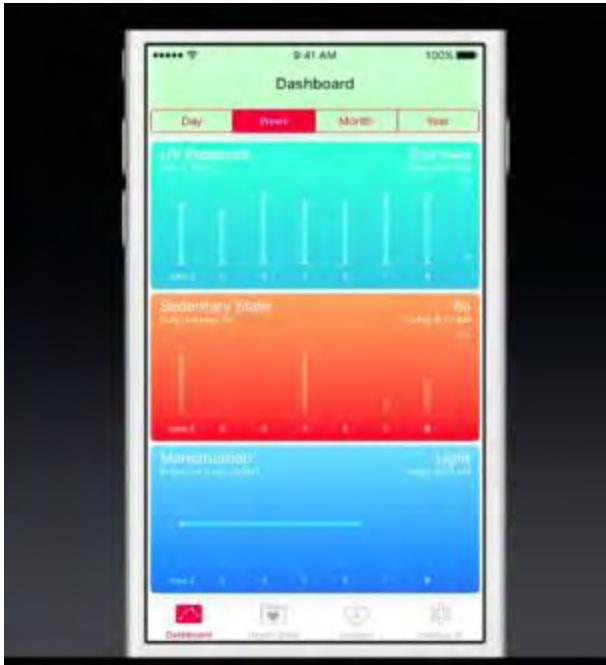
Activity Limitation

a difficulty encountered by a person
in executing a task or action

Participation Restriction

a problem experienced by a person
in involvement in life situations

Apple HealthKit Launch



“with Health, you can monitor all of your metrics that you’re most interested in”
Apple Software executive Craig Federighi

“If you’re a human who menstruates,
you’re shit out luck”

“The fact that it’s a women’s issue isn’t
grounds for dismissal”

[http://www.theverge.com/2014/9/25/6844021/
apple-promised-an-expansive-health-app-so-why-cant-i-track](http://www.theverge.com/2014/9/25/6844021/apple-promised-an-expansive-health-app-so-why-cant-i-track)

Pinkification and Menstruation



Period Diary

Other apps already exist for tracking menstrual cycles

Most employ feminine, pink, flowery aesthetics

If you only focus on the pink, you can also miss important design needs



P. Tracker Lite

Pinkification and Menstruation



Period Diary

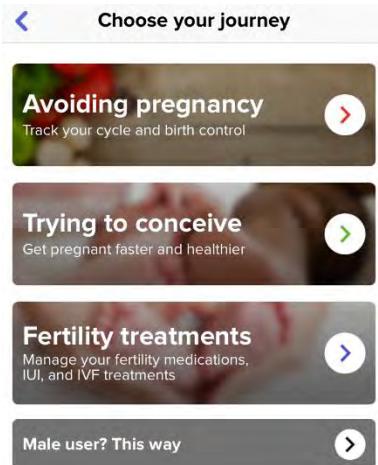


P. Tracker Lite

“they have tried to make it ‘feminine’ by adding flowers... It makes me feel like you are trying to ‘dumb it down’ for me. Why can’t keeping track of my menstruation be a professional and organized task?”

“a lot of them just felt kind of condescending or like they were designed by dudes who were designing what they thought a woman would like.”

Diverse Needs and Menstruation



Glow

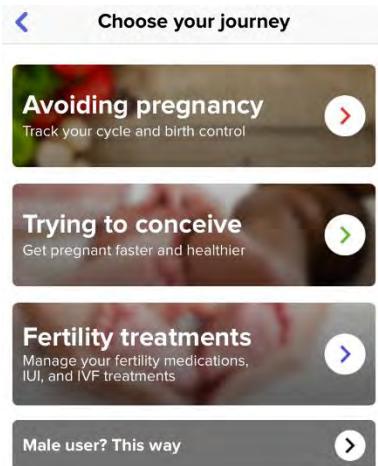


Clue

Designs implicitly assumed gender or sexual orientation

Assumptions can be subtle, like in iconography or how text is phrased

Diverse Needs and Menstruation

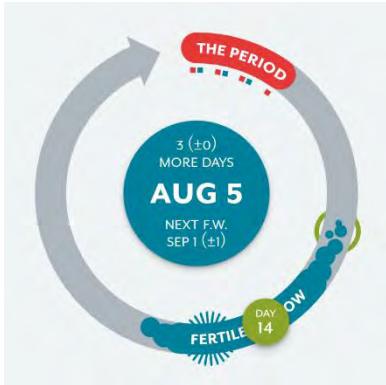


Clue

“it’s hard to find tools that work for me!
[Clue] uses gender neutral language...
it’s also not focused on pregnancy, which
I’m not interested in at all.”

“sex options assume sex with a man, and
reminder of ovulation cycle both remind
me I am not a ‘normal’ woman
whenever I use the app... but it’s not
overly pink so I deal.”

Diverse Needs and Menstruation



Clue

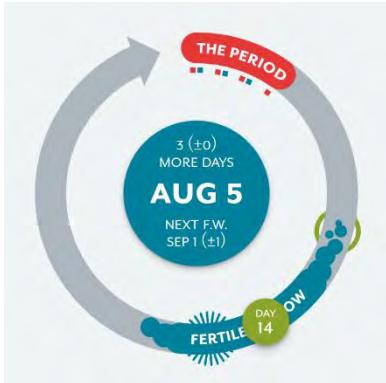


Life

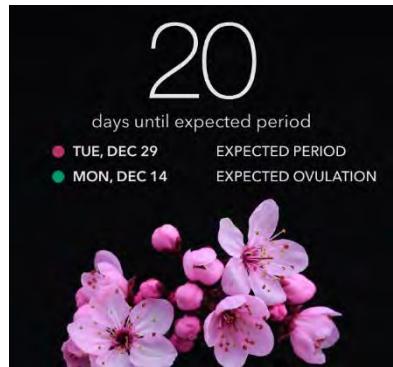
Designs often highlight ovulation information alongside the period

Such content aligns with some people's needs for tracking while de-emphasizing or ignoring the needs of others

Diverse Needs and Menstruation



Clue

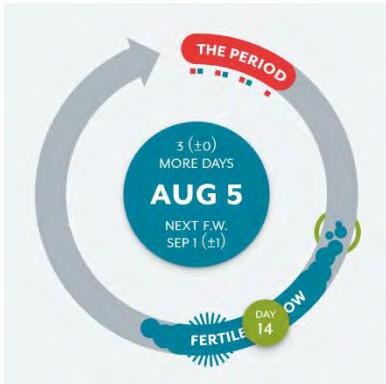


Life

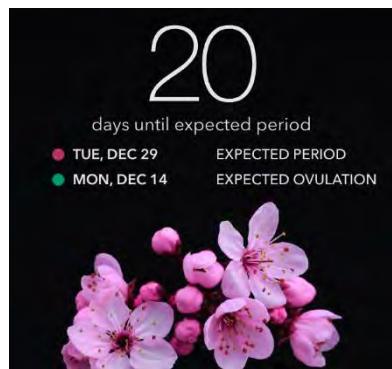
“when I was younger I used to just remember. When I started trying for a baby, it became important to know my fertile times.”

“I would like it if they made a kid’s version because idc [I don’t care] about fertile!! I’m too young!!”

Diverse Needs and Menstruation



Clue



Life

“my app shows predicted ovulation. I wish it didn't. We dealt with infertility and extensive treatments for 6 years. I am no longer trying to get pregnant and I don't like the reminder of TTC [trying to conceive] or the tiny glimmer of hope that maybe by magic this will be the month when a miracle happens.”

“a constant reminder of trying to conceive and not succeeding”

Back to Bic for Her



It is very, very hard to imagine that the people who made the decision to launch “Bic for Her” were the same women expected to buy them.

[http://www.forbes.com/sites/davidvinjamuri/2012/08/30/
bic-for-her-what-they-were-actually-thinking-as-told-by-a-man-who-worked-on-tampons/](http://www.forbes.com/sites/davidvinjamuri/2012/08/30/bic-for-her-what-they-were-actually-thinking-as-told-by-a-man-who-worked-on-tampons/)

Back to Bic for Her



It is very, very hard to imagine that the people who made the decision to launch “Bic for Her” were the same women expected to buy them.

There are lots of ways to make an awful mistake, but some of the worst could be avoided if consumer companies were staffed by actual consumers. Entrepreneurs rarely make this kind of mistake because they tend to start businesses to solve their own problem. That's why they rarely look as silly as Bic does right now.

A Social Justice Problem

1 billion people worldwide

15% of the population

50 million people in US

Including yourself if you
are fortunate to live to
develop disabilities

16% of people in the US

10% of workforce

5% of STEM workforce

1% of PhDs in STEM

“Entrepreneurs ... tend to
start businesses to solve
their own problem”

Diverse participation is
critical in effective design

A Basic Tenet of Design

You are not designing for yourself

You need to understand the context of your design and the people who will use it

We need diversity in who is doing design

As a field, our work suffers because of this failing

CSE 440: Introduction to HCI

User Interface Design, Prototyping, and Evaluation

Lecture 14:
Designing for Diverse Needs

James Fogarty
Eunice Jun
David Wang
Elisabeth Chin
Ravi Karkar



Tuesday / Thursday
10:30 to 11:50