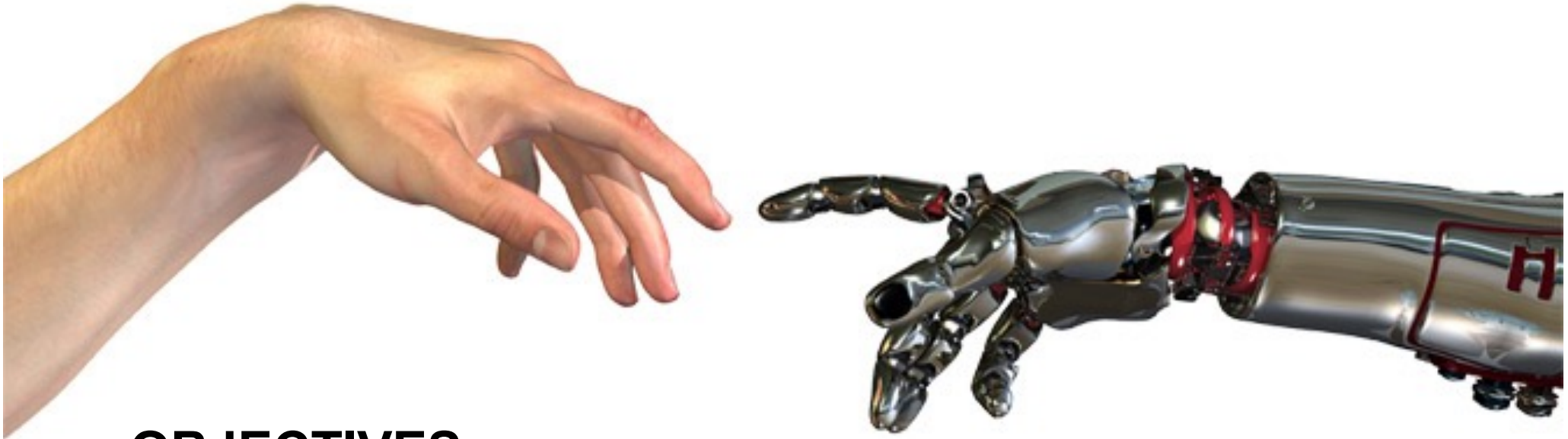
HUMAN-COMPUTER INTERACTION

UNIVERSAL PRINCIPLES OF HUMAN-COMPUTER INTERACTION DESIGN



OBJECTIVES

1.) Accessibility (cont.),
2.) Aesthetic-Usability,
3.) Accelerators

IF YOU ARE…SAY, A WEB DEVELOPER -- 4 QUESTIONS TO ASK YOURSELF

1. **Visual** (e.g., color blindness)
2. **Motor/mobility** (e.g., wheelchair-user concerns)
3. **Auditory** (hearing difficulties)
4. **Seizures** (especially photosensitive epilepsy)
5. **Learning/cognitive** (e.g., dyslexia)

- To understand these principles, ask yourself a series of questions when designing:

1. **Perceivable**: Can I consume content on my site in different ways? (Having closed captions for a video, for example)
2. **Operable**: Can the site function without confusion and without the use of a mouse or complex interactions?
3. **Understandable:** Can a user understand how the user interface of the site functions and the information on the site?
4. **Robust:** Can different assistive devices (screen readers, for example) understand the website?

STANDARDS

- But how to create and integrate specific rules and practices which would be a guide to design product in accessible approach?
- Guys/gals from W3C already did it and provide web community with guidelines, standards, and techniques, such as the Web Content Accessibility Guidelines (WCAG), which is the international standard ISO/IEC 40500.

Link to standards-https://www.w3.org/WAI/standards-guidelines/wcag/

EXAMPLES OF WEB ACCESSIBILITY*

*Did you know? Vision problems are more pervasive than most of us realize. Upwards of 285 million people worldwide are visually impaired.

- Alternative Text for Images

- Keyboard input - some people cannot use a mouse, consider *assistive technologies*

EXAMPLES OF WEB ACCESSIBILITY

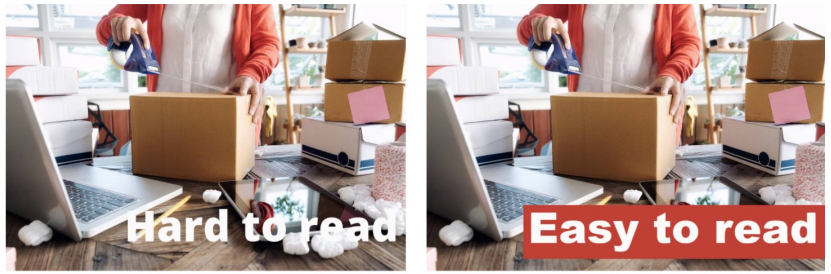
- Increase text Visibility - Proper Contrast Ratio

For each set of text within your app, the *color contrast* – or difference in perceived brightness between the color of the text and the color of the background behind the text – is recommended to be above a specific threshold. The exact threshold depends on the text's font size and whether the text appears in bold:

- If the text is smaller than 18pt, or if the text is bold and smaller than 14pt, the color contrast ratio should be at leas 4.5:1.
- For all other text, the color contrast ratio should be at least 3.0:1.

The following image shows two examples of text-to-background color contrast:

Figure 1. Lower than recommended (left) and sufficient (right) color contrast

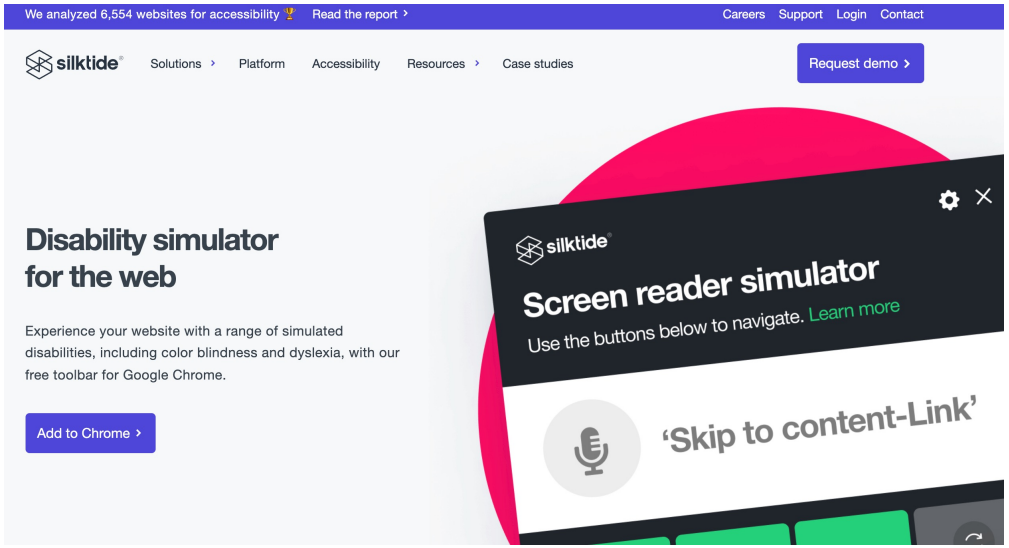


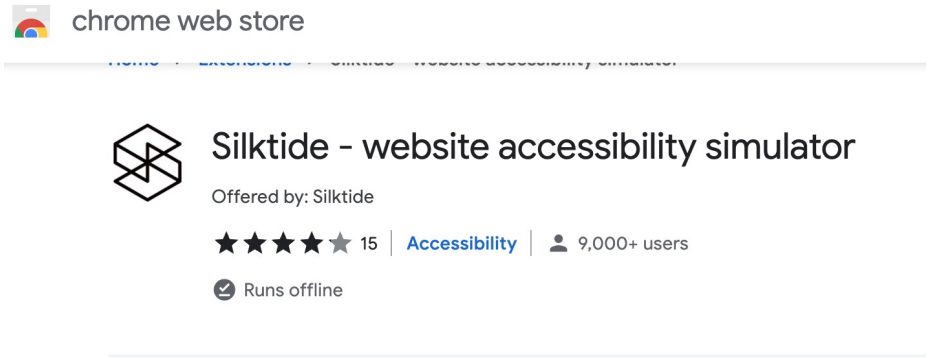
Examples of hard vs. easy to read type on images

WCAG 2.0 requires a **contrast ratio** of at least 4.5:1.

To check the text-to-background color contrast in your app, use an online color contrast checker or the Accessibility Scanner app.

EXTENSION - SIMULATOR

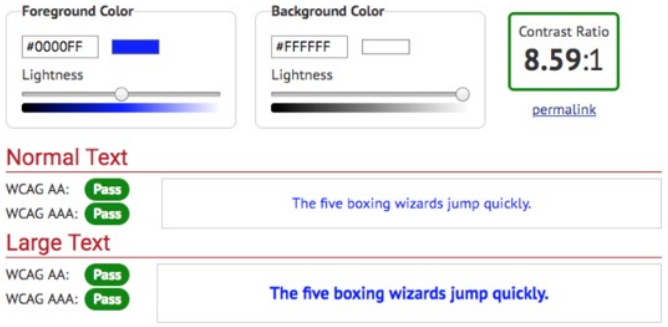




https://chrome.google.com/webstore/detail/silktide-website-accessib/okcpiimdfkpkjcbihbmhppldhiebhhaf?hl=en-US

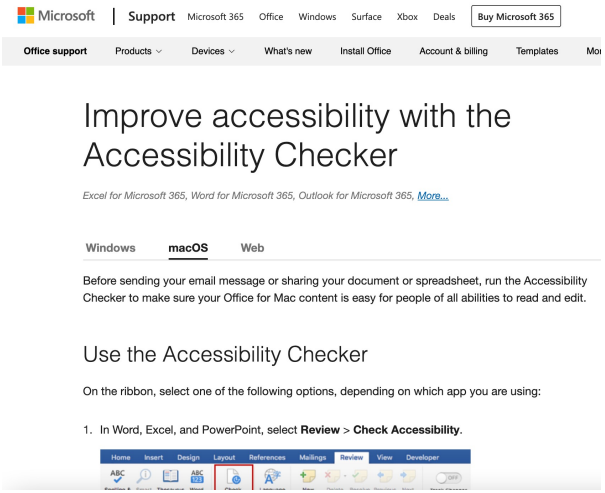
ACCESSIBILITY TOOLS AT YOUR DISPOSAL

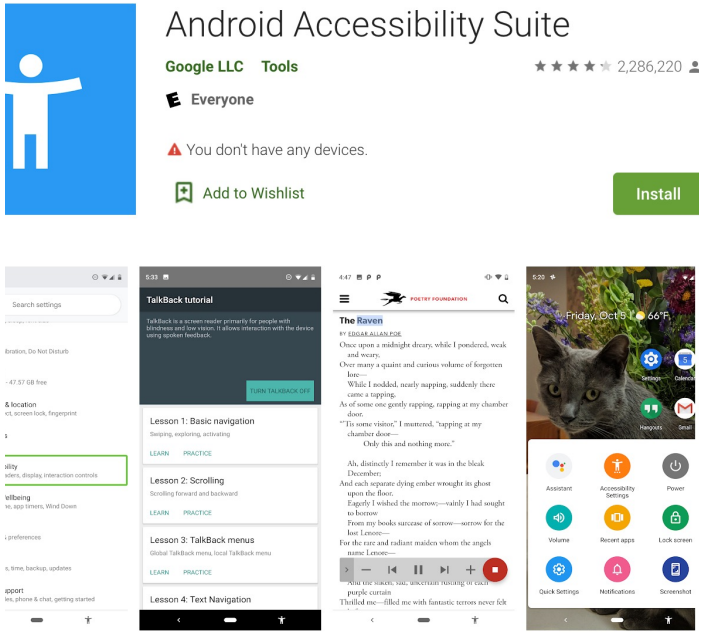
WebAIM was a first contrast checker according to WCAG guides. Here you can choose text color and background color and get Contrast Ratio score:



https://webaim.org/resources/contrastchecker/

https://support.microsoft.com/en-us/office/improve-accessibility-with-the-accessibility-checker-a16f6de0-2f39-4a2b-8bd8-5ad801426c7f





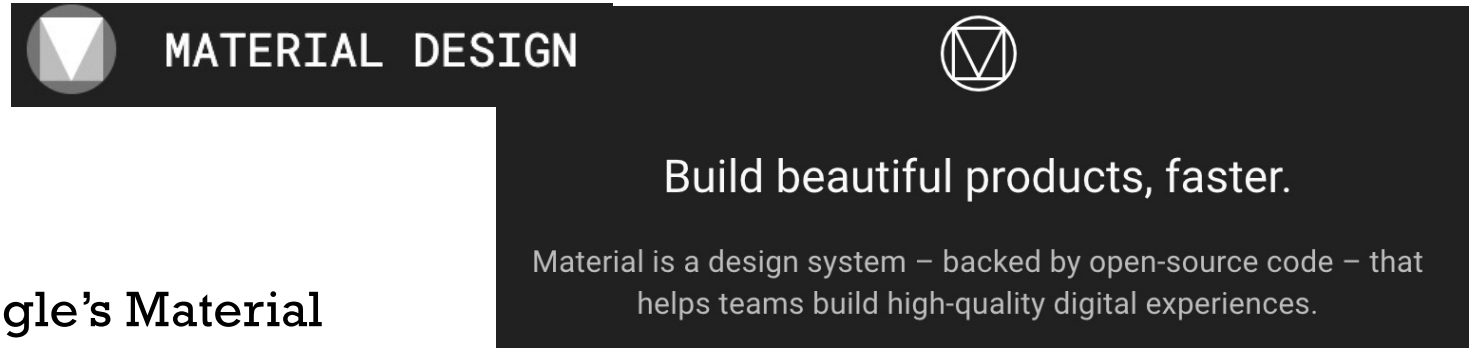
https://play.google.com/store/apps/details?id=com.google.android.apps.accessibility.auditor&hl=en

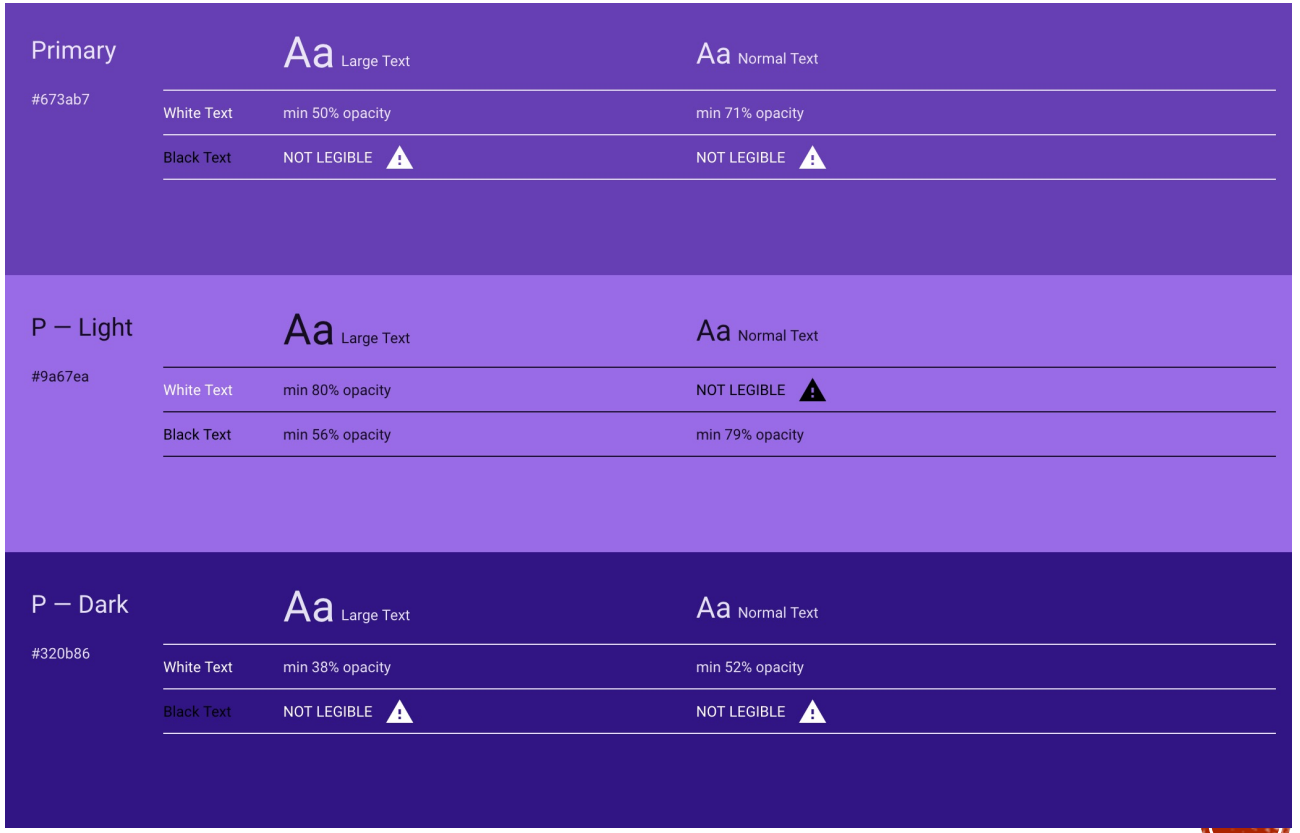
Accessibility Scanner is a tool that suggests accessibility improvements for Android apps

CHECKERS / SCANNERS

MORE ACCESSIBILITY TOOLS AT YOUR DISPOSAL

- Color tool within Google's Material Design color palette helps designers to choose the right color for his/her interface and check legibility to use it with black/white/custom text.
- A cool feature that you can see what minimal opacity of selected color you can pick.





https://material.io/resources/color/#!/?view.left=1&view.right=0&primary.color=7B1FA2

Personas for Accessible UX

Posted on January 15, 2014 by Whitney Quesenbery | 4 comments

This page has a quick introduction to the personas we created for this book. The full version of the personas with more details about them and their stories will be posted over the next few weeks.

Trevor

High school student with autism
Likes games and computer worlds
Poor reading skills and poor social skills; difficulty with visual comprehension

Meet Trevor

Emily

Goes to college and works in a community center
Has cerebral palsy and uses a computer for communication
Uses a scooter for mobility and has minimal use of her hands

Meet Emily

https://rosenfeldmedia.com/a-web-for-everyone/personas-for-accessible-ux/

TEST YOUR APP'S ACCESSIBILITY

- Testing for accessibility lets you experience your app from the perspective of your users and find usability issues that you might otherwise miss.
- Accessibility testing can reveal opportunities to make your app more powerful and versatile for **all your users**, including those with disabilities.

1. **Manual testing:** Interact with your app using accessibility services.
2. **Testing with analysis tools:** Use tools (e.g., scanners/checkers to discover opportunities to improve your app's accessibility.
3. **Automated testing:** Turn on accessibility testing in e.g., Espresso (https://developer.android.com/training/testing/espresso/accessibility-checking) and Robolectric (http://robolectric.org/javadoc/3.1/org/robolectric/util/AccessibilityUtil.html).
4. **User testing:** Get feedback from real people who interact with your app. "Real people" = those with disabilities.

WHY BEAUTIFUL-LOOKING PRODUCTS ARE PREFERRED OVER USABLE-BUT-NOT-BEAUTIFUL ONES.

VS

Aesthetic-Usability Effect

- Aesthetic designs are perceived as easier to use than less aesthetic designs.

- A similar phenomenon is documented with regard to human attractiveness-first impressions of people influence attitude formation and measurably affect how people are perceived and treated.

v.s.

Majority of the audience who heard the first debate on radio thought Nixon won; those who watched on television were so seduced by the visual that they gave the nod to Kennedy.

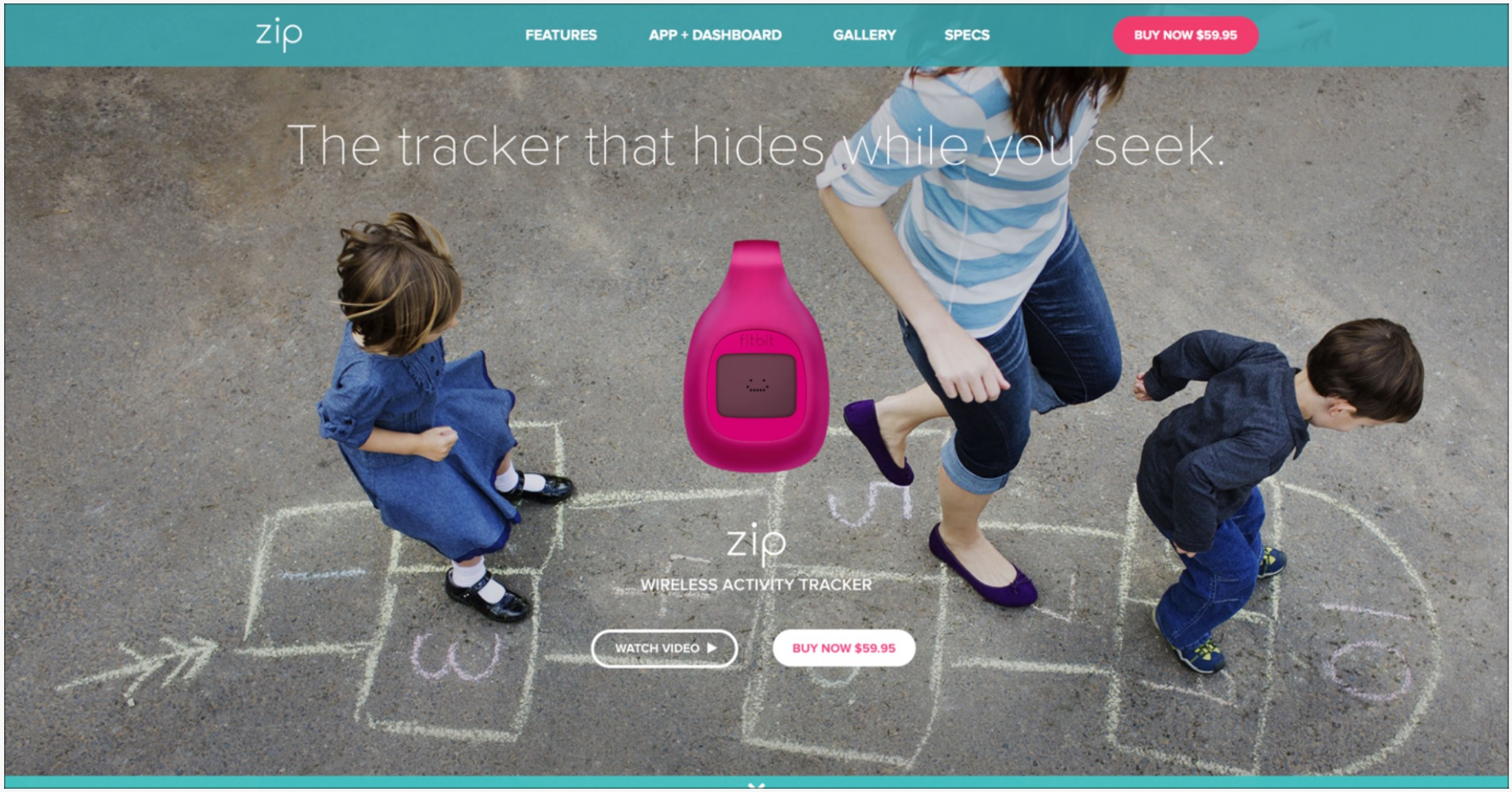
Aesthetic-Usability Effect — subjectively rated easier to use even when no usability advantage can be objectively measure.

Aesthetic things are perceived to be easier to use than ugly things.

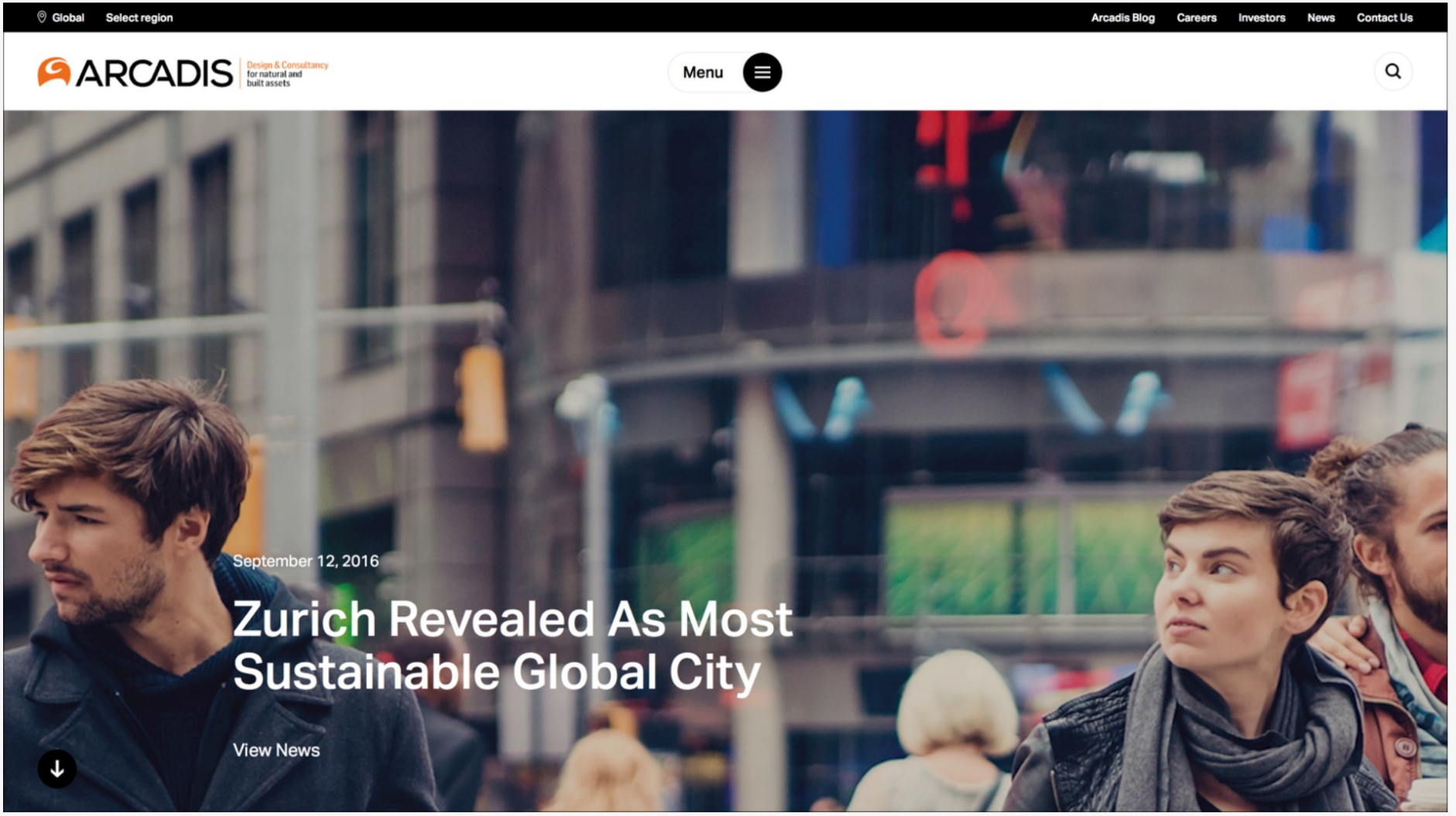
- Aesthetic things are often subjectively rated as easier to use, even when no usability advantage can be objectively measured.
- Aesthetic things are more effective at fostering positive attitudes than ugly things, making people more tolerant when problems are encountered.
- Aesthetic things are more likely to be tried, accepted, displayed, and repeatedly used than ugly things.
- Aspire to create aesthetically pleasing designs. It is more than ornamentation—it is an investment in user acceptance, forgiveness, and satisfaction.

People display the HomeHero extinguisher on counters due to its striking aesthetic, making it more accessible in emergencies.

Remember, what they say, versus what they do ….



Evolution of user's perception, can change…



A KEY TAKE HOME POINT & PSYCHOLOGY AT USE 

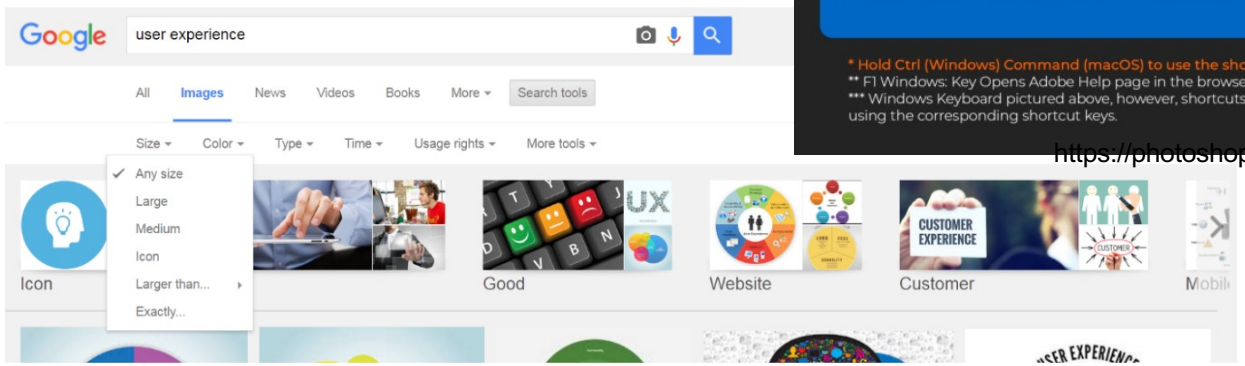
- What people say vs. what they do
  - You as a Developer, Design, Research, Computer Scientist, HCI person must find this out.
  - Why the clown (for the record they scare me – eek)…
    - Images evoke physiological responses, memories, etc.
    - I use them to help make what I hope is a memorable point or to break flow and get your attention.

ACCELERATORS - ALLOW THE USER TO DO MORE OR LESS!

HOW TO HANDLE 80/20-PARETO EFFECT (SEE IN PARETO EFFECT IN SLIDES TO COME) IN INTERFACE DESIGN PROVIDES FLEXIBILITY + EFFICIENCY FOR MORE USERS.

- Accelerators – unseen by the novice user – may often speed up the interaction for the expert user such that the system can cater to both inexperienced and experienced users. Allow users to tailor frequent actions.

https://photoshoptrainingchannel.com/photoshop-keyboard-shortcuts/



While a novice user uses the default google image search, the expert user always can refine the search by size, color, type, and so on.