

# Multimodal Design Patterns for Inclusion & Accessibility



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# INTRODUCTIONS

# What is the Inclusive Design Research Centre?

- Located at OCAD University in Toronto, directed by Jutta Treviranus
- Does design research both in web accessibility and on the broader area of designing inclusively
- Among the things our work is rooted in...
  - Social model of disability / disability as mismatch
  - Involvement in standards development such as WCAG and ARIA
  - Open movements (FOSS, open education, Creative Commons)
  - Practice-based and practice-led research

# What is the Fluid Project?

- An open source software community
- Focused on web accessibility and inclusive design
- <http://fluidproject.org/>

# Who Am I?

- Work at OCAD University's Inclusive Design Research Centre
- Inclusive software developer and researcher
- Former public librarian & library software developer

# Who Are You?

- You can be more than one of these...
  - Developers
  - Designers
  - Managers
  - Assessors / Testers
  - Consultants
  - Something I didn't categorize (sorry!)

# WHAT IS MULTIMODAL DESIGN?

# “...one intended to accommodate different patterns of input and output...”

- A modality is “a particular mode in which something exists or is experienced or expressed”
- Designing and building with an explicit aim towards multiple modalities of experience, either discretely or separately
- For *input* and *output* we might substitute terms such as...
  - *interaction* and *perception*
  - *operability* and *perceivability*



# Philosophy

- Design to accommodate different patterns of input and output
- Make implementations flexible to support future adaptability
- Avoid thinking in terms of “normal” and “alternative”
- Consider how to use different modes of presentation or interaction, separately or in combination

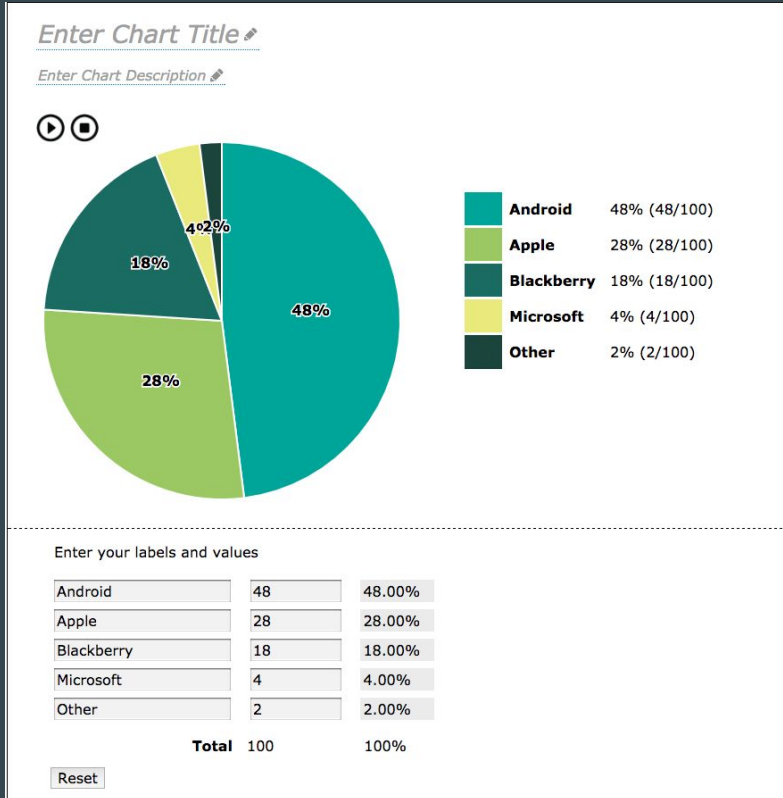
# Practically

- As accessibility practitioners, you already have an orientation towards this approach
- Consider screens vs. screen readers, mouse input vs. keyboard input...
- Further out, we can think about less explored scenarios
  - Can we render complex data as sound (“sonification”) in the same way we can “visualize” data as charts and graphs?
  - Can we reimagine what’s possible with input devices like head trackers and switches?
  - How do we build systems that can be adapted more easily to new modalities?

# EXAMPLES FROM OUR WORK

# What Does a Pie Chart Sound Like?

<http://build.fluidproject.org/chartAuthoring/demos/>



# How Can We Make Music Together?



# How Do We Create Inclusive Science Experiments?



# How Do We Create Inclusive Simulations?



[https://phet.colorado.edu/sims/html/john-travoltage/latest/john-travoltage\\_en.html](https://phet.colorado.edu/sims/html/john-travoltage/latest/john-travoltage_en.html)

# TOOLS AND PATTERNS FOR IMPLEMENTATION



# Separation of Concerns

- Foundational principle of software architecture
- Found in web development in the different roles of HTML, CSS, and Javascript, front-end and back-end, etc
- Systems should have easily identifiable components pieces that can be separated, swapped, remixed...

# Open Systems, Oriented to Transformation

- Not necessarily open source (though we are fans of that), but a principle that content and data should be easily externalized and transformed
- Contrastingly, opaque, entangled, monolithic systems are tough on accessibility! (I am sure many of you live this on a daily basis)
- Personally, I'm excited by increasing awareness of the value of APIs in areas like CMS and other enterprise systems - not because this is the end goal, but because of the progress and direction

# Tools We Work With on the Fluid Project

- Infusion (<http://docs.fluidproject.org/infusion/development/>)
  - A transformation-oriented, loosely-coupled Javascript framework.
- The Nexus ([https://wiki.gpii.net/w/Nexus\\_API](https://wiki.gpii.net/w/Nexus_API))
  - A general-purpose communication technology for transforming inputs and outputs of arbitrary devices or software.
- The Inclusive Design Guide (<https://guide.inclusivedesign.ca/>)
  - Living documentation of our inclusive design thinking as it evolves and deepens

# BROADER IMPLICATIONS AND THOUGHTS

# Our Thinking Matters

- How we conceptualize our work in accessibility matters a great deal for how the work gets done and how we communicate about it
- I would encourage you to think of yourself and your work through a critical lens of multimodal design...
- An insistence that no mode of sensory experience or means of input is “primary” or “normal”, with the others as “alternatives”

# Our Language Matters

- The language of "accommodation" and "alternative presentation" places a certain perspective upon disability
- These are obviously important concepts from a regulatory standpoint, and we cannot ignore them in our work
- However, as with our thinking, I encourage you to look at language through a critical lens and consider how it may shape and circumscribe our work

# Accessibility and the Multimodal World

- We are sometimes frustrated by the remedial nature of accessibility work, and we ask ourselves why these considerations don't happen sooner in the build process, when they are easier to remedy
- I would argue that one reason this happens is because our design and development practices give primacy to certain modalities, that of the so-called “normal” user
- Inflexible implementations encode these primacies; accessibility work then becomes alternatives, accommodations, remedies and workarounds
- I would encourage you to think widely about how designs might be experienced from the very beginning, and to advocate as best you can for flexible systems

QUESTIONS?



# Links and Resources

## Videos

- “A Musical Introduction to the Nexus”:  
[https://www.youtube.com/watch?v=7R\\_pz2Fz4qE](https://www.youtube.com/watch?v=7R_pz2Fz4qE)
- “Nexus Inclusive Science Lab”:  
<https://www.youtube.com/watch?v=NNwc0VYRhUU>
- “PhET Simulations and Auditory Descriptions”:  
<http://stemforall2017.videohall.com/presentations/882>

## Fluid Project and Related Projects

- Main Site: <http://fluidproject.org/>
- Wiki: <https://wiki.fluidproject.org/>
- Global Public Inclusive Infrastructure:  
<http://gpii.net/>
- Flexible Learning for Open Education:  
<http://floeproject.org/>
- Inclusive Learning Design Handbook:  
<http://handbook.floeproject.org/>
- Inclusive Design Guide:  
<https://guide.inclusivedesign.ca/>