MAKING PROGRAMMING INCLUSIVE

CS279 Embedded EthiCS module
WHO AM I?

• Cat Wade, philosophy graduate student
• Contact: cmcdonaldwade@g.harvard.edu
• Office hours: by appointment!
ON THE AGENDA

• WHAT is inclusive design?
• WHO do we design inclusively for?
• WHY should we design inclusively? (1)
• HOW do we design inclusively?
• WHY should we design inclusively? (2)
• HOW do we design inclusively… inclusively?
WHAT IS ‘INCLUSIVE DESIGN’?
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Microsoft Design
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WHO DO WE DESIGN INCLUSIVELY FOR AND WITH?
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TWO MODELS OF DISABILITY

Medical Model
• The limitations facing the disabled are due to their physical or mental impairments
  • “You can’t see the film because your tourettes will be disruptive.”
• Disability as an abnormality, deficit or lacking
  • “Being quadriplegic means you cannot walk, you are without the use of your limbs.”

Social Model
• The limitations of the disabled are due to a mismatch between their needs and the environment
  • “You can’t climb at our facility because we don’t have the resources we need.”
• Disability is not an abnormality or something to be ‘overcome’, it’s at most a difference between bodies and minds that is exacerbated by society and environments catering to the needs of some but not all bodies and minds

What are some pros and cons of each model?
“Disabilities is an umbrella term, covering impairments, activity limitations, and participation restrictions.”

- Impairments
- Activity Limitations
- Participation Restrictions
WHO DEFINITION OF DISABILITY

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WHO DEFINITION OF DISABILITY

“disability is a...dynamic interaction between health conditions and environmental and personal factors.”
WHY SHOULD WE DESIGN INCLUSIVELY? (1)
WHY SHOULD WE DESIGN INCLUSIVELY?

• ENABLE THOSE WITH DISABILITIES
• DRAW ON THE EXPERIENCE AND EXPERTISE OF THOSE WITH DISABILITIES
WHY SHOULD WE DESIGN INCLUSIVELY?

• ENABLE THOSE WITH DISABILITIES

• In the US in 2016, 35.9% of people with disabilities ages 18-64 living in the community were employed. The employment percentage was more than double for people without disabilities, 76.6%.

• DRAW ON THE EXPERIENCE AND EXPERTISE OF THOSE WITH DISABILITIES
WHY SHOULD WE DESIGN INCLUSIVELY?

• ENABLE THOSE WITH DISABILITIES

• In 2016, the median earnings of people with disabilities ages 16 and over in the US was $22,047, about two-thirds of the median earnings of people without disabilities, $32,479.

• DRAW ON THE EXPERIENCE AND EXPERTISE OF THOSE WITH DISABILITIES
WHY SHOULD WE DESIGN INCLUSIVELY?

- ENABLE THOSE WITH DISABILITIES

- The poverty percentage gap, or the difference between the percentages of those with and without disabilities, has been between 7.4 and 8.3 percentage points over the past 8 years.

- DRAW ON THE EXPERIENCE AND EXPERTISE OF THOSE WITH DISABILITIES
WHY SHOULD WE DESIGN INCLUSIVELY?

• ENABLE THOSE WITH DISABILITIES

• DRAW ON THE EXPERIENCE AND EXPERTISE OF THOSE WITH DISABILITIES
WHY SHOULD WE DESIGN INCLUSIVELY?

- Enable those with disabilities
- Draw on the experience and expertise of those with disabilities
- Unique and differing experiences give rise to innovative thinking and novel perspectives
WHY SHOULD WE DESIGN INCLUSIVELY?

• ENABLE THOSE WITH DISABILITIES

• DRAW ON THE EXPERIENCE AND EXPERTISE OF THOSE WITH DISABILITIES

• Economic and productivity related reasons are often cited to hiring managers
WHY SHOULD WE DESIGN INCLUSIVELY?

• Enable those with disabilities

• Draw on the experience and expertise of those with disabilities

• When designing so as to enable the disabled community… you must hear from, work with and employ people from the disabled community.
WHY SHOULD WE DESIGN INCLUSIVELY?

• ENABLE THOSE WITH DISABILITIES

• DRAW ON THE EXPERIENCE AND EXPERTISE OF THOSE WITH DISABILITIES

• When designing so as to enable the disabled community... you must hear from, work with and employ people from the disabled community!

**AREAS OF IMPROVEMENT ADDRESSED BY ASSISTIVE TECHNOLOGY**
- Reading
- Writing
- Memory
- Listening
- Mathematics
- Organization
- Building access
- Physical mobility
- Social interactions
- Athletic participation

**ASSISTIVE TECHNOLOGY FOR LEARNING AND IN-CLASS ACTIVITIES**
- Light signals
- Touch screens
- Screen readers
- Screen magnifiers
- Text-to-speech (TTS)
- Wands and joysticks
- Sip-and-puff systems
- Alternative keyboards
- Voice recognition software
- Braille embossers and refreshable braille displays

**ASSISTIVE TECHNOLOGY FOR PHYSICAL MOBILITY**
- Ramps
- Openers
- Scooters
- Grab bars
- Wheelchairs
- Hand-held GPS units
- Automatic doors
- Wider doorways
- Adapted car seats
WHY SHOULD WE DESIGN INCLUSIVELY?

- **ENABLE THOSE WITH DISABILITIES**
  
- **DRAW ON THE EXPERIENCE AND EXPERTISE OF THOSE WITH DISABILITIES**
  
- When designing so as to enable the disabled community... you must hear from, work with and employ people from the disabled community!
HOW DO WE DESIGN INCLUSIVELY?
WHY SHOULD WE DESIGN INCLUSIVELY? (2)
ETHICAL PERSPECTIVES ON DESIGN THAT ENABLES

A. RIGHTS BASED (1): individuals have both positive and negative rights, including the right to equality of opportunity

B. RIGHTS BASED (2): individuals have only negative rights, including the right to be free from interference/theft/bodily harm.

C. HARMS-BASED: we should strive to do things that will cause the least amount of harm/the most amount of pleasure possible
HARMS VS. RIGHTS

Positive Rights TO certain things

Negative rights FROM certain things
HARMS VS. RIGHTS

Positive Rights TO certain things
Negative rights FROM certain things

NON-NEGOTIABLE!
HARMS VS. RIGHTS

Promoting goods!
Preventing harms!

IF you subscribe to a rights account, then rights can trump goods and harms.
<table>
<thead>
<tr>
<th>ETHICAL PERSPECTIVES ON DESIGN THAT ENABLES</th>
</tr>
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<tbody>
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Which of these perspectives would give us ethical reasons to design inclusively, in the sense of creating design that enables?
HOW DO WE DESIGN INCLUSIVELY... INCLUSIVELY?

• Answer: by drawing on the expertise of those with disabilities

Chieko Asakawa
HOW DO WE DESIGN INCLUSIVELY... INCLUSIVELY?

• Answer: by drawing on the expertise of those with disabilities

Chieko Asakawa

“Everyone has a different perspective and different experiences,” she says. “For me, my blindness has been an advantage for my research... It’s just different. And these differences have been very helpful. So I think diversity is the key to innovation.”
ETHICAL PERSPECTIVES ON DESIGNING INCLUSIVELY, INCLUSIVELY

PRESERVATION OF COMMUNITY AND CULTURE

• Deaf community and culture is highly valuable

• Without including them in design decisions and policies the risk of erasing deaf culture is greatly increased

STAYING NEUTRAL RE: MODELS OF DISABILITY

• Importantly – deafness can be too easily understood as a deficit to be fixed rather than a difference to be celebrated
CONCLUSION

1. Inclusive design is comprised of two things:
   i. Designing products that enable
   ii. Drawing on the experience and expertise of all people, but especially those who are marginalized and ESPECIALLY those for whom enabling design is intended to facilitate

2. Disability is understood in different ways, but a model that emphasizes the interaction between physical and mental differences and environmental mismatches is more sensitive to the complexity of disability

3. Inclusive design for disabled persons is supported by strong ethical reasons (as well as economic reasons)
   i. Enabling design: 3 ethical perspectives all give us reasons to design (especially technology) that enables disabled people
   ii. Drawing on experience and expertise: perspectives of the disabled are needed to challenge the ‘medical model’ of disability, and, crucially, to respect and maintain the culture of disabled communities
Thank you!
cmcdonaldwade@g.harvard.edu

RESOURCES

• https://www.microsoft.com/design/inclusive/
• https://plato.stanford.edu/entries/disability/#ModDis
• https://www.who.int/topics/disabilities/en/
• https://disabilitycompendium.org/sites/default/files/user-uploads/2017_AnnualReport_2017_FINAL.pdf
• https://thegroundtruthproject.org/one-programmer-used-disability-advantage/