Accessibility Seminar
Persons with Disabilities

Richard Ladner
University of Washington

1

Computer Scientists

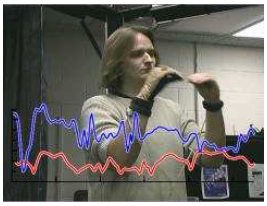
TV Raman
Google

Chieko Asakawa
IBM Japan

2

Computer Scientists

Raja Kushalnagar



Christian Vogler

3

Computer Scientists

Anindya “Bapin” Bhattacharyya
Helen Keller National Center

4

Engineer

Iraq War Veteran
Jonathan Kuniholm

5

Geerat Vermeij

Geerat Vermeij, Ph.D.
Evolutionary Biologist

6

Steven Hawking

7

UW Students

Zach Lattin
Math Major

Sangyun Hahn
Ph.D. Student
CSE

5

The Message

- People with disabilities can do almost anything in almost any scientific field.
- People with disabilities are often highly motivated to pursue careers in accessible computing research.

9

What We'll Do Today

- Purpose of the Seminar
- Data
- Models of Disability
- Terminology
- Impact of Access Technology

10

Purpose of the Seminar

- Learn about persons with disabilities and the technologies that give them access.
  - Practitioners
  - Researchers
  - Users
- Focus on mobile technologies
  - Android Platform
  - iPhone Platform

11

Tentative Schedule

- 9/30/09. Richard E. Ladner, CSE. Persons with disabilities.
- 10/07/09. Richard E. Ladner, CSE. Accessibility technology and research.
- 10/14/09. Richard Mander, Entrepreneur in Residence University of Washington. Assistive Technology Industry with and emphasis on mobile accessibility.
- 10/21/09. Maria Kelley, UW Center for Technology and Disability Studies, Washington Assistive Technology Act Program. Assistive Technology Services.
- 10/28/09. Alan Borning, CSE. One-bus-Away.
- 11/04/09. Shaun Kane, ISchool. Survey on mobile devices used by persons with disabilities.
- 11/18/09. Bruce Visser, Lighthouse for the Blind. Technology for blind and deaf-blind people.
- 11/25/09. Shani Jayant, CSE. MobileAccessibility Project.
- 12/02/09. Anindya "Bapin" Bhattacharyya, Helen Keller National Center for Deaf-Blind Youths and Adults. Mobile technology for deaf-blind people.
- 12/09/09. Shiri Azenkot, CSE. iPhone Accessibility Applications.

12

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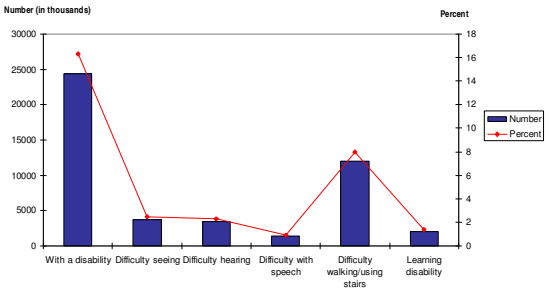
13

Basic Data

- 650 million people world-wide are disabled
- 16% of US population to ages 15 to 64 is disabled.
- 10% of the workforce is disabled
- 5% of the STEM workforce is disabled
- 1% of PhDs in STEM are disabled

14

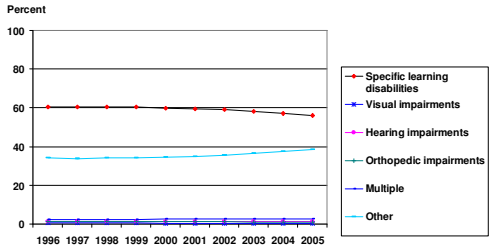
Demographics US Population



Source: U.S. Census Bureau, Survey of Income and Program Participation, 2002

15

Demographics Ages 14-21



SOURCE: U.S. Department of Education, Office of Special Education Programs, www.ideadata.org

16

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17

World Health Organization

- International Classification of Functioning, Disability and Health (ICF), 2001
  - Health: umbrella term for disease, disorder, injury, or trauma.
  - Functioning: umbrella term for body functions and structures, activities, and participation.
  - Disability: umbrella term for impairments, activity limitations, and participation restrictions.

18

Models of Disability

- **Medical Model**
  - Disabled people are patients who need treatment and/or cure.
- **Education Model**
  - Disabled youth need special education.
- **Rehabilitation Model**
  - Disabled people need assistive technology and training for employment and everyday life.
- **Legal Model**
  - Disabled people are citizens who have rights and responsibilities like other citizens. Accessibility to public buildings and spaces, voting, television, and telephone are some of those rights.
- **Social Model**
  - Disabled people are part of the diversity of life, not necessarily in need of treatment and cure. They do need access when possible.

19

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20

What Term Should I Use?

- Person with a disability
- Disabled person
- Person with a physical impairment
- Physically impaired person
- Person with a handicap
- Handicapped person
- Person who is physically challenged
- Physically challenged person

21

What Term Should I Use?

- Person with a disability (PC in US, not outside)
- Disabled person (PC in England)
- Person with a physical impairment (medical)
- Physically impaired person (no)
- Person with a handicap (no)
- Handicapped person (no)
- Person who is physically challenged (no)
- Physically challenged person (no)

22

Let's Get More Specific

- **Visually impaired**
  - Popular in education and medical circles but may emphasize the negative
- **Blind**
  - A term that is accepted by blind people
- **Low vision**
  - A term that is accepted by low vision people
- **Partially sighted**
  - A term used by some sighted people to describe themselves

23

Terminology Matters

- Working with the National Association of the Deaf
- Working with the National Federation of the Blind
- A research paper review

24

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25

Technology

- **Prosthesis**
  - Augmentation to restore lost function. Call it a "cure."
- **Assistive technology**
  - Popular in rehabilitation literature. Emphasis on the need for assistance.
- **Access technology**
  - Allows an activity that would be difficult to impossible to achieve without it. Emphasis not on restoring function, but on achieving an end goal by whatever means possible.
  - Examples: Screen readers, video phones, wheel chairs

26

Personal Texting by Deaf People

TTY used by deaf people in their homes circa 1970

Modern TTY with built-in acoustic modem

Instant Messaging

27

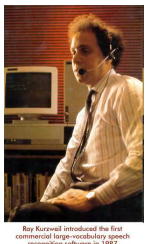
Optical Character Recognition for Blind People

Kurzweil Machine Circa 1976

K-NFB Reader Mobile

28

Speech Recognition for Hands Free Access

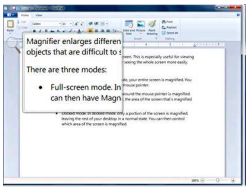


Ray Kurzweil introduced the first commercial large-vocabulary speech recognition software in 1987

UW student 2006

29

Built-in Accessibility



Windows 7 Magnifier

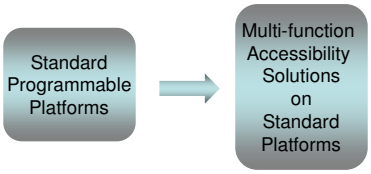
iPhone VoiceOver

30

Trend

31

Potential Trend

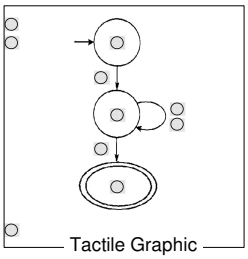


Laptops, notebooks, phones,… are programmable!!

32

Example: Digital Pen Tactile Graphic

Digital Pen



Tactile Graphic

Josh Scotland, RL

33

What's the problem?

The New York Times

Tuesday, September 15, 2009

Insurers Fight Speech-Impairment Remedy

Insurers, including Medicare, won't pay for $300 speech solution on an iPhone, but will pay for an $8,000 single function "medical device" for text-to-speech generation.

Why? The iPhone is not considered to be a medical device.
Disabled people viewed only in the medical model.

34

Possible Future Scenario

- Blind person buys a standard cell phone and data service.
- Downloads accessibility applications to suit needs.
  - GPS application for location and directions
  - Bar code reader
  - OCR application
- Move from medical model to social model

35

Discussion

36