A Better Society Through Computers

Lawrence Snyder
University of Washington, Seattle

With Special Thanks to Prof. Richard Ladner

"Computers" + "Social"

- When we think of computers and society at the same time, we usually think of social media – FB, Twitter, Tumblr, Pinterest

"Computers" + "Social"

- When we think of computers and society at the same time, we usually think of social media – FB, Twitter, Tumblr, Pinterest

- Instead, think of ways computers make the society better
- Today:
  - Assistive Technologies help people with disabilities
  - Crowd Sourcing harnesses the power of the people

Who's Considered Disabled?

- 650 million people worldwide

  - Sight: blind, low vision, color blind
  - Hearing: deaf, hard of hearing
  - Speech: limited ability to speak, stuttering
  - Mobility: limited ability to walk, use hands, arms
  - Cognition: dyslexia, short-term memory loss, dementia
  - Multiple: deaf-blindness

Assisting The Blind

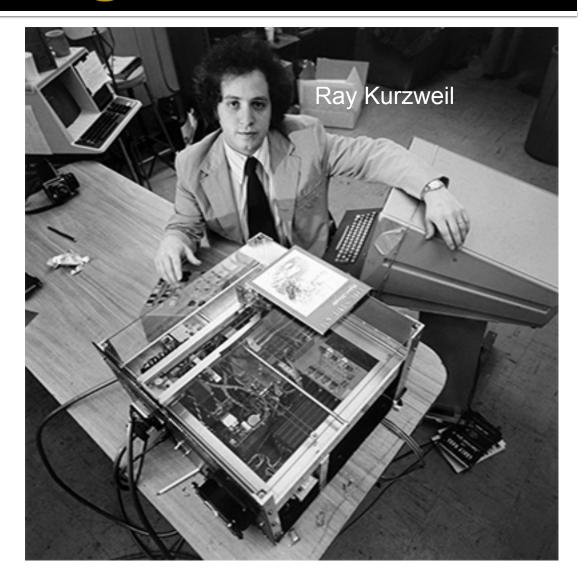Ray Kurzweil built first text-to-speech machine

- Think of the problems

  - High resolution scanning of documents

  - Character recognition from bits (OCR)

  - Word identification

  - Speech Synthesis

  + a zillion tough tech

  problems in between

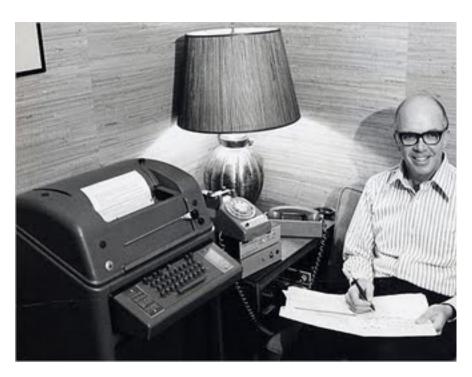 ## AMAZING!

Kurzweil Reading Machine

Stevie Wonder said: "The Kurzweil Reading Machine was a breakthrough that changed my life. With the Kurzweil Reading Machine, I could read anything I wanted with complete privacy: music lyrics, letters from my children, the latest best sellers and magazines, memos from my business associates. It gave blind people the one thing that everyone treasures, which is independence."

Ray Kurzweil

Expanding Technologies

https://www.youtube.com/watch?v=TOwDzDnd9NY

KNFB Reader

Prismo for iPhone

Texting: TTY to SMS

Deaf people need to type/read text when communicating over a distance … since the invention of the acoustic modem in the '70s this has been possible, but only now is mobile

From The Examples ...

- Technologies designed to assist the disabled to function in society usually turn out to be extremely useful to everyone!
  - Telephone
  - Texting
  - OCR
  - Speech recognition
  - Speech synthesis
  - Electric toothbrush
  - Sidewalk curb ramps and on and on and on ...

What Else Can Be Done – Lots!

- How about ASL over a smart phone?

Tough problems: Bandwidth, Computer Speed, Battery Life

Take Home Message

- Don't think of disabled people as a medical, educational or social "problem" … think how tech can let them live WELL with a disability

> Assisting The Disabled Is Right!
> First: Their Lives Are Better
> Next: Everyone's Life Is Better

Crowd Sourcing

- Crowd sourcing is a distributed problem-solving and production technique
  - Problems are broadcast to an unknown group of 'solvers'
  - 'Solvers' – the crowd – submit solutions that become the property of the broadcaster
  - They are compensated in some form -- money, prizes, community accolades, intellectual satisfaction and/or skill development
- Computers are the perfect 'agent' for this!

Before There Were Computers ...

- Crowd sourcing doesn't need computers ...
- The Oxford English Dictionary (OED), started in 1857, is an example. (It has EVERY English word in it; it's so huge a person would need 120 years to type it in!)
- OED gave a general call for people to find the earliest use of each word ... so, for example, *byte* was first used in 1964
- 1,000s and 1,000s of people have helped out, and continue to
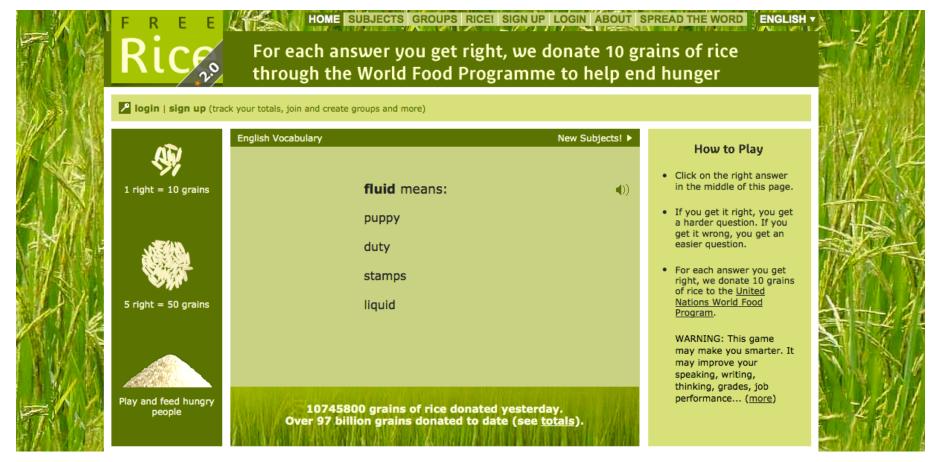
More Familiarly ...

Byte

From Wikipedia, the free encyclopedia

Not to be confused with Bite or Bight. This article other uses, see Byte (disambiguation).

The **byte** /ˈbaɪt/ is a unit of digital information in comp most commonly consists of eight bits. Historically, the encode a single character of text in a computer[1][2] an addressable unit of memory in many computer archite historically been hardware dependent and no definitiv

- The database of knowledge

More Familiarly …

- ## www.freerice.com

- ## UN Food Program gets rice; Users learn vocab

More Familiarly …

- ## www.kickstarter.com

- ## Entrepreneur gets presales; users get discounts

More Familiarly …

- beamartian.jpl.nasa.gov

- ## NASA processes data; user gets prizes, status

More Familiarly …

- <u>fold.it</u> [http://vimeo.com/focusforwardfilms/semifinalists/51888393]

- AIDS research furthered; users get status!!!

Types of Crowd Sourcing

- What other crowd sourcing activities are you familiar with?

Types of Crowd Sourcing

- What other crowd sourcing activities are you familiar with?

- What types of crowd sourcing do the examples illustrate?

Why Does Crowd Sourcing Work?

- People bring a variety of skills to the problem –
  - Gamers may be better at 3D visualization than people selected for medical research knowledge
  - Motivation – Learning vocabulary and giving rice to UNWFP is better than learning vocabulary alone
  - Large supply of workers with nothing else to do –
    - Mechanical Turk exploits programming skills
    - Being a Martian is a "better" time waster than SuDoKu
  - Collective intelligence trumps a few smart people
- Participating in something new is FUN!

Take Home Message

- Computers and the Internet made crowd sourcing a powerful, easy-to-apply idea that makes the world better
- We may all be able (and eager to) contribute
- If "two heads are better than one" than a million heads are at least better than 500,000