

# A Better Society Through Computers

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*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.**"



# Expanding Technologies

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



FROM: KURZWEILTECH.COM

KNFB Reader

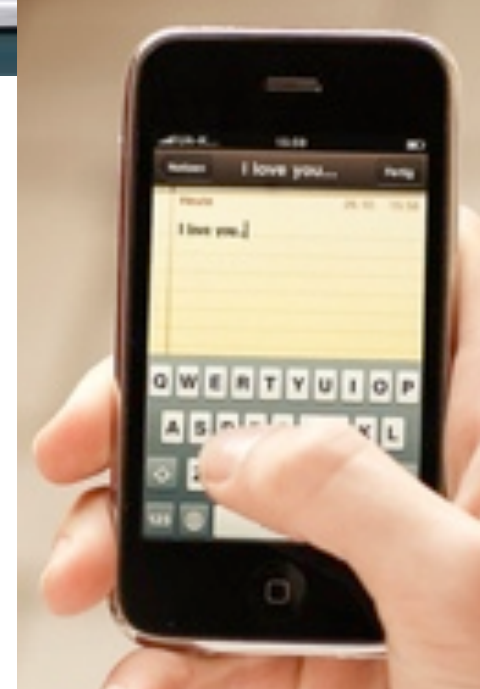
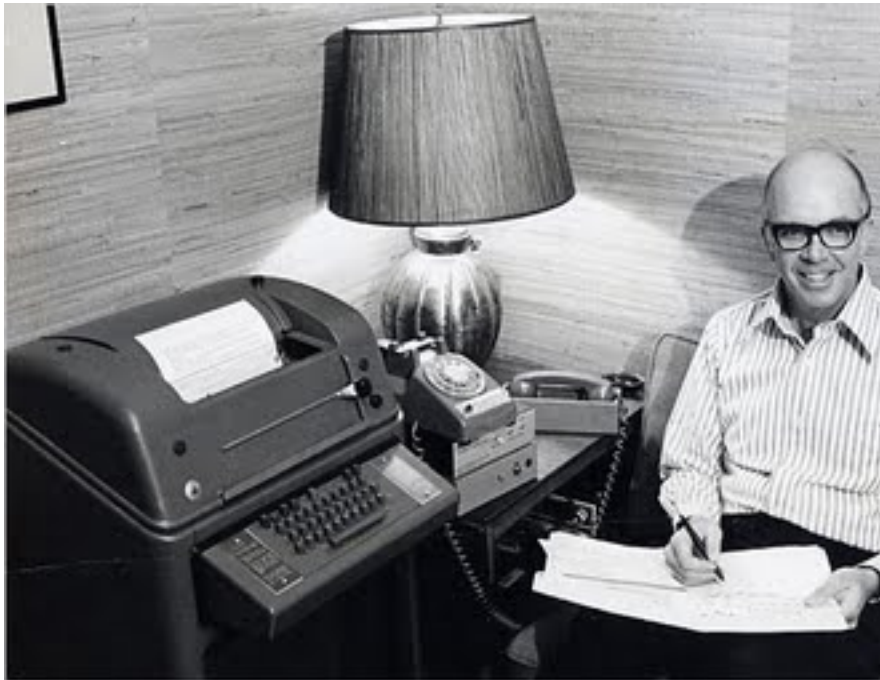


Prismo for iPhone





# 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 ...



Article [Talk](#) [Read](#) [Edit](#) [View history](#)

## Byte

From Wikipedia, the free encyclopedia

*Not to be confused with [Bite](#) or [Bight](#). This article has 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](#)<sup>[1][2]</sup> an [addressable](#) unit of [memory](#) in many [computer archite](#) historically been hardware dependent and no definitiv the size. The [de facto standard of eight bits is a conv](#)

- The database of knowledge



# More Familiarly ...

- [www.freerice.com](http://www.freerice.com)

The screenshot displays the Freerice website interface. At the top, a navigation bar includes links for HOME, SUBJECTS, GROUPS, RICE!, SIGN UP, LOGIN, ABOUT, SPREAD THE WORD, and ENGLISH. The main header features the Freerice logo and a mission statement: "For each answer you get right, we donate 10 grains of rice through the World Food Programme to help end hunger". Below the header, there are options to login or sign up. The central content area is titled "English Vocabulary" and shows a question: "fluid means:". The possible answers listed are puppy, duty, stamps, and liquid. To the left of the question, there are three icons representing different levels of rice donation: 1 right = 10 grains, 5 right = 50 grains, and a pile of rice with the text "Play and feed hungry people". To the right of the question, there is a "How to Play" section with three bullet points explaining the game mechanics and the donation process. At the bottom of the page, a green banner displays the statistics: "10745800 grains of rice donated yesterday. Over 97 billion grains donated to date (see totals)".

- UN Food Program gets rice; Users learn vocab

# More Familiarly ...

- [www.kickstarter.com](http://www.kickstarter.com)

The screenshot shows the Kickstarter project page for 'Iva Jean: Bike Fashion for Women, Spring 2013' by Ann DeOtte. The page features a video player with a 'PLAY' button, showing three women modeling different styles of clothing. To the right of the video, the project statistics are displayed: 86 backers, \$7,585 pledged of a \$15,000 goal, and 22 days to go. A green button labeled 'Back This Project' with '\$1 minimum pledge' is visible. Below the video, there are social media sharing options (Like, Tweet, Embed) and a link to the project page. The project is located in Seattle, WA, and is categorized under Fashion.

**KICKSTARTER** What is Kickstarter? Discover great projects Start your project Search projects Help Sign up Log in

## Iva Jean: Bike Fashion for Women, Spring 2013

by Ann DeOtte

Home Updates 0 Backers 86 Comments 1 Seattle, WA Fashion

86 backers  
**\$7,585**  
pledged of \$15,000 goal  
**22**  
days to go

**Back This Project**  
\$1 minimum pledge

This project will only be funded if at least \$15,000 is pledged by Friday Dec 7, 6:27pm EST.

Project by **Ann DeOtte**  
Seattle, WA  
Contact me

Like 792 people like this. Sign Up to see what your friends like. Tweet Embed <http://kck.st/PEQE9W>

- Entrepreneur gets presales; users get discounts

# More Familiarly ...

- [beamartian.jpl.nasa.gov](http://beamartian.jpl.nasa.gov)



- NASA processes data; user gets prizes, status

# More Familiarly ...

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

fold it BETA  
Solve Puzzles for Science

20:09:04 GMT

PUZZLES BLOG CATEGORIES FEEDBACK GROUPS FORUM PLAYERS WIKI FAQ RECIPES ABOUT CONTESTS CREDITS

GET STARTED: DOWNLOAD

Win Beta  
Windows (XP/Vista/7)

Mac Beta  
OSX (Intel 10.4 or later)

Linux Beta  
Linux (64-bit)

Click to learn how you contribute to science by playing Foldit.

SEARCH  
Google

RECOMMEND FOLD

USER LOGIN

SOLOISTS EVOLVERS GROUPS TOPICS

PLAYER	PUZZLE	SCORE
meatexplosion 55 10	652: 40 Residue...try	11,312
karstenw 22 21	653: CASP ROLL ...025	10,969
doug.ehlert 28 3	651: Electron D...d 2	3,169
smilingone 6 6	Beginner Puzzle...lin	9,726
retiredmichael 140 4524	Beginner Puzzle...lin	9,573
Ribo-soma 40 510	Beginner Puzzle...lin	9,633

FULL

TOP NEW USERS

- kathinka1984
- Brodosh
- lostwarp
- parsnip
- mirp

What's New

**Vote for a short documentary on Foldit!**

A short documentary on Foldit is a semi-finalist for the FOCUS FORWARD Filmmaker Competition! You can help it win the Audience Favorite award by voting for it online. The video is here, and the "VOTE" button is in the top-right of the video.

<http://vimeo.com/focusforwardfilms/semifinalists/51888393>

(Thu, 11/15/2012 - 16:24 | 0 comments)

- 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