January 21, 2014

ENGR110/210
Perspectives in Assistive Technology

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Margaret Mongare

Professor Drew Nelson

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Questions?

Today's Handouts, Signup Sheets, and Fillout Forms

For all students:

- Attendance List - important to verify your attendance at every class session

For all students and community members:

- Class Session Evaluation Form

Comments from Last Year's Students

If I were to go through this process again, there are a few things I would do differently. I would like to spend a larger amount of time on the empathizing step of the design process and be able to get to know the consumer of the product and their concerns on a closer level. Also, I would like to engage the team in a longer brainstorm process and have repeated sessions after each idea is fully drawn out and created. <u>These sessions provided the best opportunities for advancing our design and making each prototype more effective and efficient at accomplishing the set tasks.</u>

Comments from Last Year's Students

Looking back, I now realize how important it is to really *define the problem as specifically as possible from the beginning**, without being too narrow-minded that the general purpose is forgotten.*

Comments from Last Year's Students

I definitely learned that prototyping early on is a must - even if I had no clue what I was going to do then. Next time, I will definitely try to <u>get started earlier on building things - even if they are at their less-than-best quality</u>!

Comments from Last Year's Students

If I could go back, I would have sought out more users to discuss the topic sooner. I wish I could have received more feedback from members of my target group to incorporate their thoughts and concerns in my final design. Moving forward, I will definitely make a concentrated effort to involve the user group throughout the entire design process. <u>I think this will contribute to an overall more effective and successful concept and design.</u>

Comments from Last Year's Students

I would have attempted to prototype far more often, preferably at least 8 hours a week, instead of about 8 hours total, with some more time working on further ideas.

Comments from Last Year's Students

In retrospection, improving the success of our design would have been most largely dependent on determining a solvable need as quickly as possible. If this could have been decided upon within the first two weeks of class through user and company interviews, teams would be much more successful in design prototyping and brainstorming being that iteration would have been a more realistic possibility.

Comments from Last Year's Students

If I were to do the entire process again I would invest more time talking to fellow students and bouncing off ideas.

If I were to go through this process again, I would utilize the teaching staff more.

Throughout the design process, I now see that it is imperative to keep in touch with users. I feel it would be very beneficial to consult different professionals in expertise related to the project. <u>Insight from a range of perspectives, from users to experts, would truly enhance a design.</u> I also learned the importance of making sure we can prototype our ideas.

MLK

How might the teachings of Dr Martin Luther King Jr. relate to people with disabilities?

"I have a dream that my four little children will one day live in a nation where they will not be judged by the color of their skin but by the content of their character."

Who is Disabled?

Disability is defined as a health condition or physical impairment that prevents an individual from taking full advantage of life's opportunities such as education, vocation, recreation, and activities of daily living.

Who is Disabled?

- A 70 year old Englishman with ALS cannot walk, talk, or personally perform any of the usual activities of daily living. He has only very limited volitional control of one finger and one facial muscle.

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- This individual uses a speech output communication device to facilitate his communication.

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- This individual employs a powered wheelchair for his mobility.

- This individual uses a speech output communication device to facilitate his communication.

- The individual is Stephen Hawking, often described as the smartest person alive.

Question?

- What makes the difference between Hawking's ability and disability?

Observation

- Even individuals with severe disabilities can produce extraordinary achievements and benefit society

Who is Disabled?

- Superman

… came to Earth with powers and abilities far beyond those of mortal men

Who is Disabled?

- Superman

- Superman with Kryptonite

Observation

- There are situations that can cause temporary impairments in even the most able-bodied individuals

What's the Point?

- With limited or incomplete information, you may not be able to make an accurate determination of a person's abilities / capabilities

- With limited or incomplete or <u>biased</u> information, you may not be able to make an accurate assessment

  - Political issues
  - Individual's character
  - Product advertising
  - News reports
  - Movie reviews

Important to Note

- Other – hidden – conditions can affect communication ability

  - Brain injury
  - PTSD
  - Psychological factors

- Other hidden disabilities:

  - Hearing, sight
  - Use of prosthetics or orthotics
  - Learning or developmental conditions
  - Progressive health / disease conditions

Design Development Process

- Opportunities in assistive technology
  - Activities of daily living
    - Self care, dressing, mobility, eating and meal preparation, eating, personal hygiene, communication, hobbies, sports, travel, work, education
  - Prescription process
  - Team – stakeholders
  - Paying for assistive technology
  - Different types of devices – low & high tech
  - Instruction
  - Abandonment

Design Development Process

- Suggestions:
  - Take an iterative, multi-criteria approach
  - Involve all stakeholders early on and throughout the design process
  - Know the user
  - Appropriate level of technology
  - Price
  - Resources

- Designing with people
  http://designingwithpeople.rca.ac.uk/

Lectures

- Lecture topics are chosen for their interest, but may not relate to specific projects
  - More projects than lecture slots
  - Lectures are scheduled before some projects are received
  - No lecture on playgrounds
  - No project on exoskeletons

Community Members

- Stanford students not enrolled in the course
- OT students from Samuel Merritt College
- Employees of Office of Accessible Education
- Non-students from the local area
- Individuals with disabilities
- Project suggestors
- Device vendors

- They all add to the discussion

Community Members

- Seminar courses often open to the public
- Advertised on Stanford Events

- Motivations
  - Learn more about assistive technology
  - Attend an interesting lecture

Google Smartlens
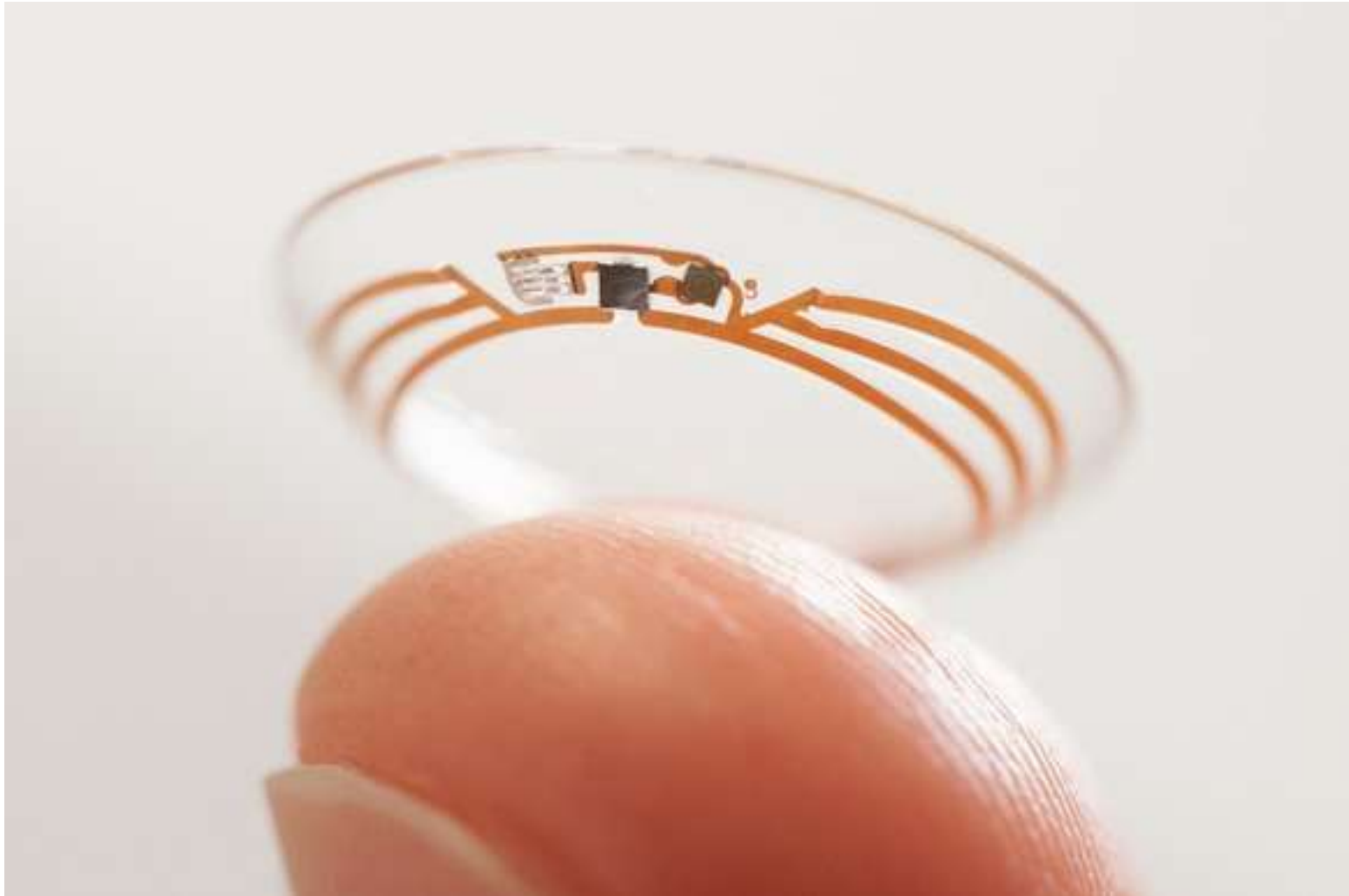
INTERESTED? | visit bases.stanford.edu

b BASES

1st place

2nd place

3rd place

OVER 100K IN FUNDING

DEADLINE: FRIDAY, JANUARY 24

APPLY TO BASES CHALLENGE 2014

EVERY TEAM NEEDS

A Stanford affiliation

with an SUID

E-CHALLENGE
BASES CHALLENGE

Requirements: Business model canvas, 200 word summary, slide deck with three slides

SOCIAL E-CHALLENGE
BASES CHALLENGE

Requirements: Completed executive summary of business idea (1-2) pages

PRODUCT SHOWCASE
BASES CHALLENGE

Requirements: Working prototype, three-part online application on Younoodle

Miscellany

1. Make up missed lectures within one week
2. Slides posted on course lecture website as well as recorded audio, weblinks, photos, and video
3. Weekly project progress – by email or meeting
4. Anonymous Suggestion Box
   – http://engr110.stanford.edu/suggestion.html
5. PRL Safety Orientation & Shop passes

Thursday, January 23rd

Katherine Strausser, PhD

The Design and Control of Exoskeletons for Rehabilitation

Today

Morgan Duffy, Kareem Edouard,
Nathaniel Wynn, Aubrie Lee,
Kartik Sawhney, and Christopher Connolly

Perspectives of Stanford Students with a Disability

Short Break

Break Activities

- Stand up and stretch
- Take a bio-break
- Text message
- Web-surf
- Respond to email
- Talk with classmates
- Reflect on what was presented in class
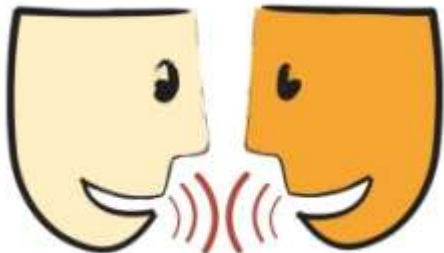
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**Perspectives of Stanford Students
with a Disability**
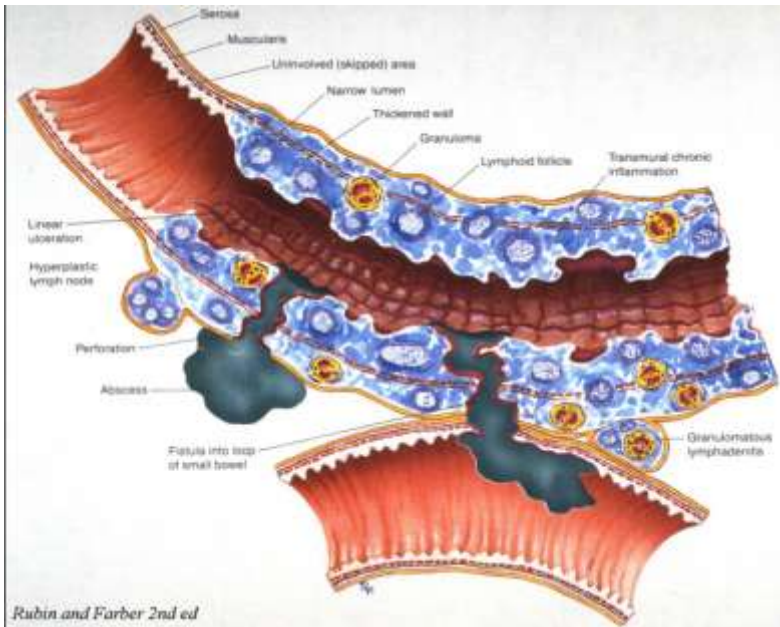
Morgan Duffy

Kareem Edouard

Nathaniel Wynn

Crohn's Disease

Nathaniel Wynn

Stanford University, Class of 2012

Rubin and Farber 2nd ed
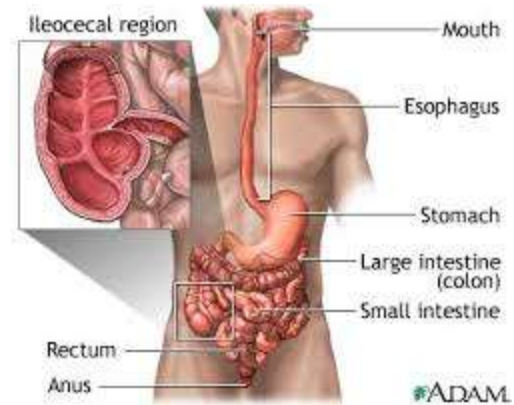
©University of Texas School of Medicine
Health Science Center, San Antonio

Symptoms

External

- Diarrhea, esp. bloody
- Constipation
- Abdominal pain
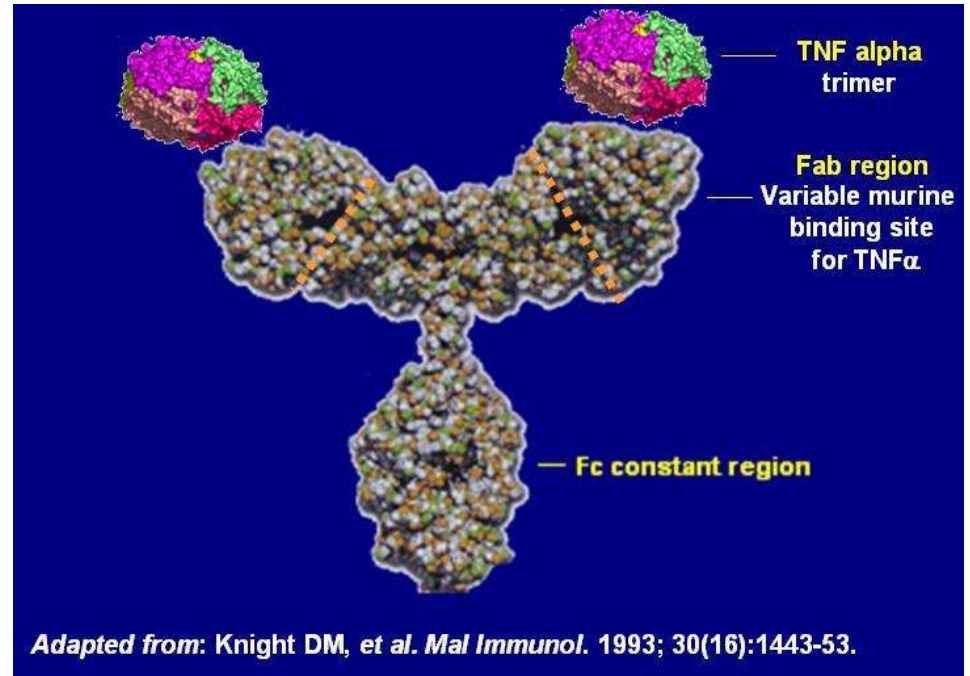- Loss of appetite
- Weight loss
- Joint pain

Internal

- Ulceration
- Fistulas
- Abscess
- Bowel obstruction
- Inflammation
- Nutritional deficiencies
- Drug side effects

My Weight Fluctuation Trends

Treatment Options

Adapted from: Knight DM, et al. Mal Immunol. 1993; 30(16):1443-53.
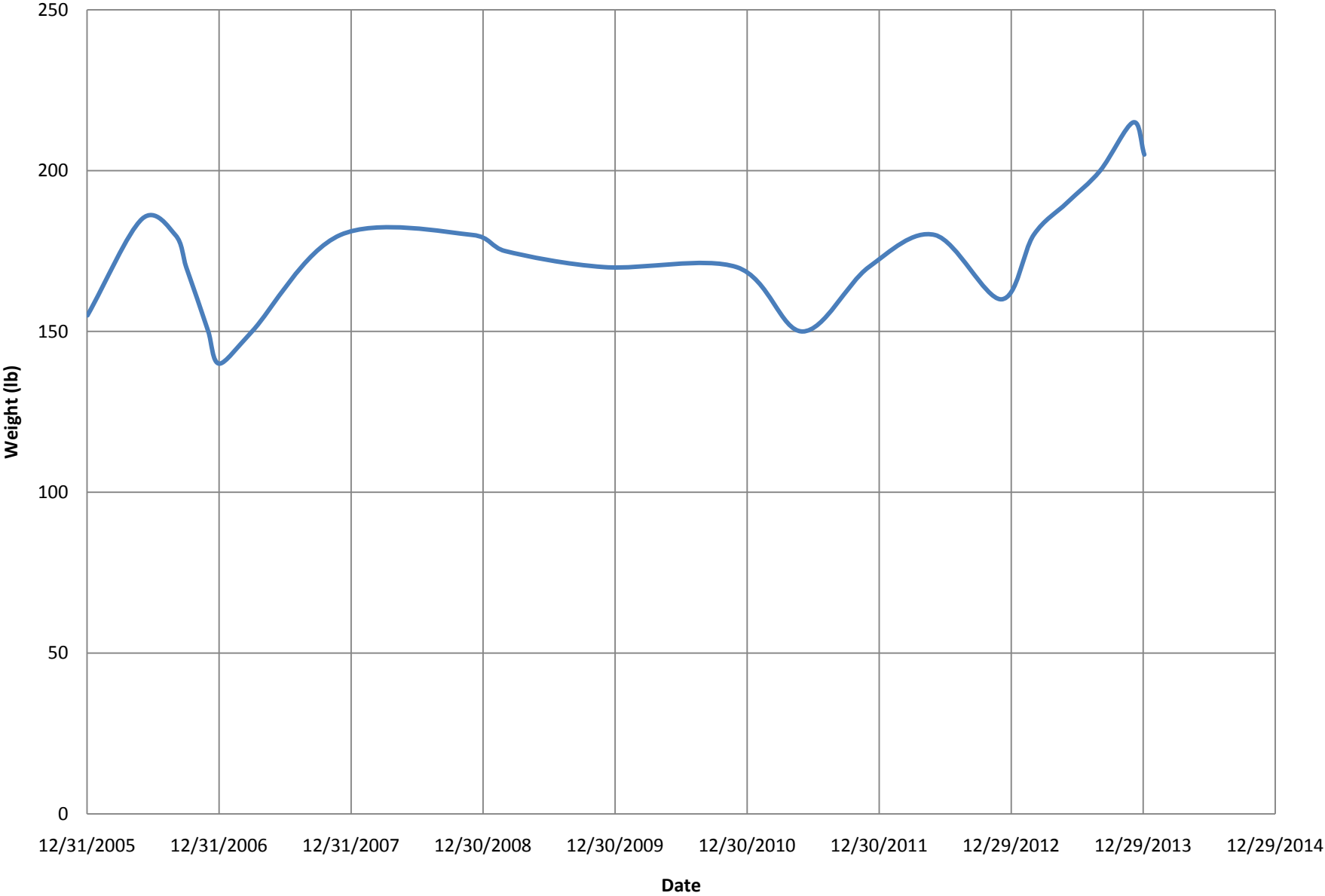
Resources

- OAE: make up tests/labs, late homework allowances, lack of attendance requirement
- CCFA: www.ccfa.org

Aubrie Lee

Kartik Sawhney

Christopher Connolly