HCI and Design

Admin
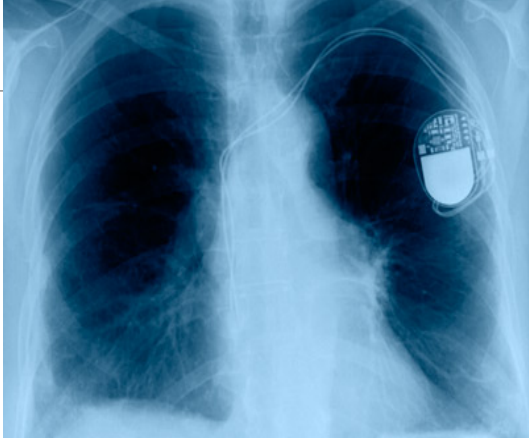
No class next week... Spring Break!

Today: Designing for Marginalized Communities

New technologies provide new benefits

Most new technologies benefit a small fraction of the global population

80% of world's population lives in "developing" regions

Design for Marginalized Communities

Goal: Create technologies that empower underserved or marginalized communities to overcome global challenges

There are marginalized communities everywhere!

Three defining characteristics

Global problems	Technology constraints	Human challenges
Poverty	Computers	Culture
Education	Cell phones	Gender
Gender equality	Mobile devices	Politics
Infant mortality	Networks	Language
Maternal health	Connectivity	Literacy
Human rights	Energy and power	Social structures
Conservation	Transport	Communication

What platforms make sense?

Sub-Saharan Africa's mobile market by the numbers

Mobile cellular subscriptions per 100 people

2001 **2%**
2006 **18%**
2011 **53%**

1 billion
Expected total number of mobile cellular subscriptions in Africa by 2015. Mobile cellular subscriptions in 2005 totalled 90.3 million and in 2010 that figure stood at 384 million.

Number of countries with at least one mHealth app

14
29
9
6
7

- Sub-Saharan Africa
- Latin America & Caribbean
- Middle East & North Africa
- East Asia and Pacific
- South Asia
- Europe & Central Asia

Sources: World Bank, GSMA, Informa Telecoms & Media

Why target mobile devices?

Portable

Battery-powered

Familiar

Intuitive touchscreen

Built-in sensors

Network interfaces

Storage capacity

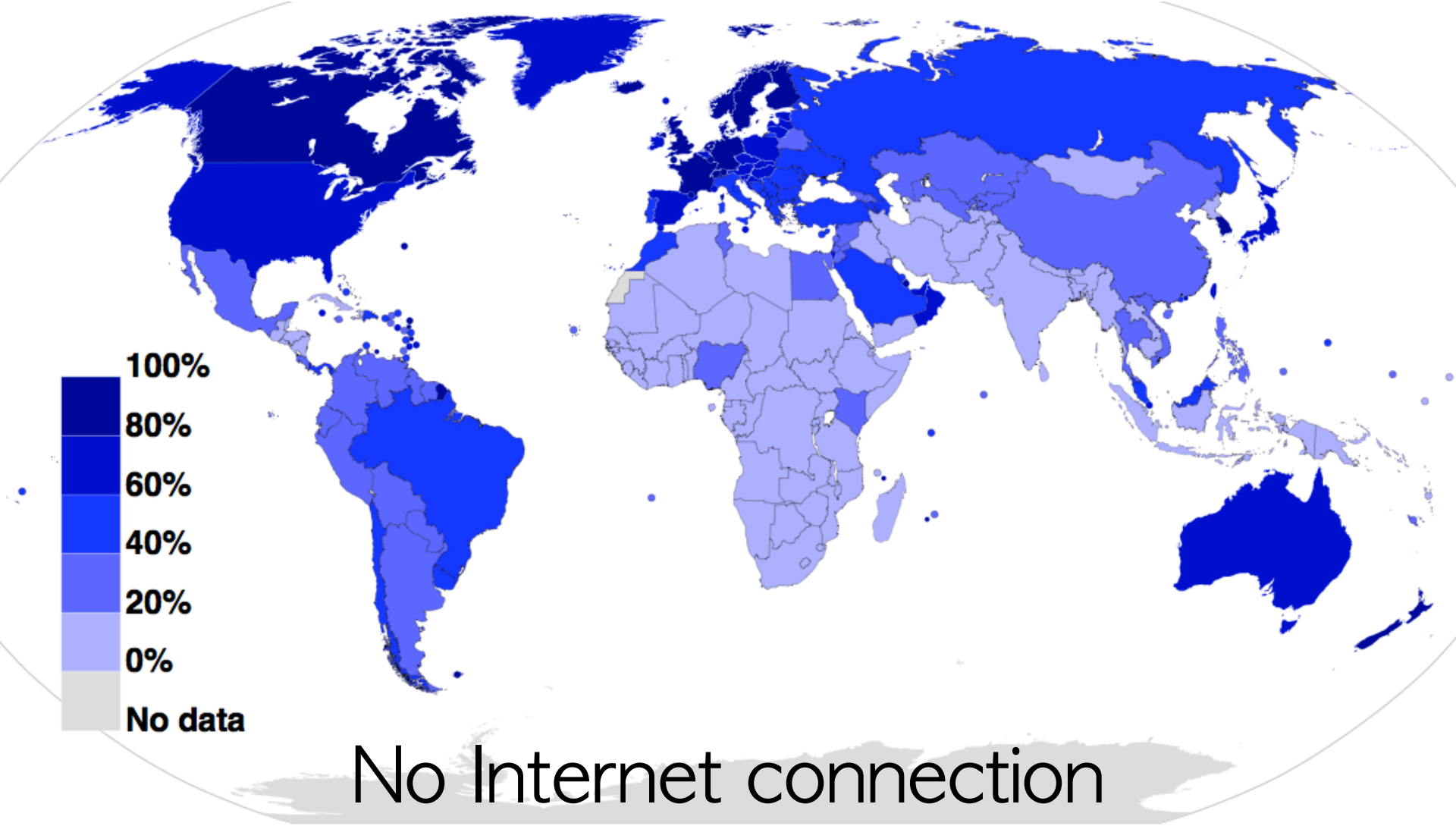# Built-in sensors provide many opportunities

Can we just use the same apps and systems that we use in the US?

Internet users in 2010 as a percentage of a country's population
Source: Percentage of Individuals using the Internet 2000-2011, International Telecommunications Union.

100%
80%
60%
40%
20%
0%
No data

No Internet connection

Many other constraints

No or intermittent electricity

Low levels of education

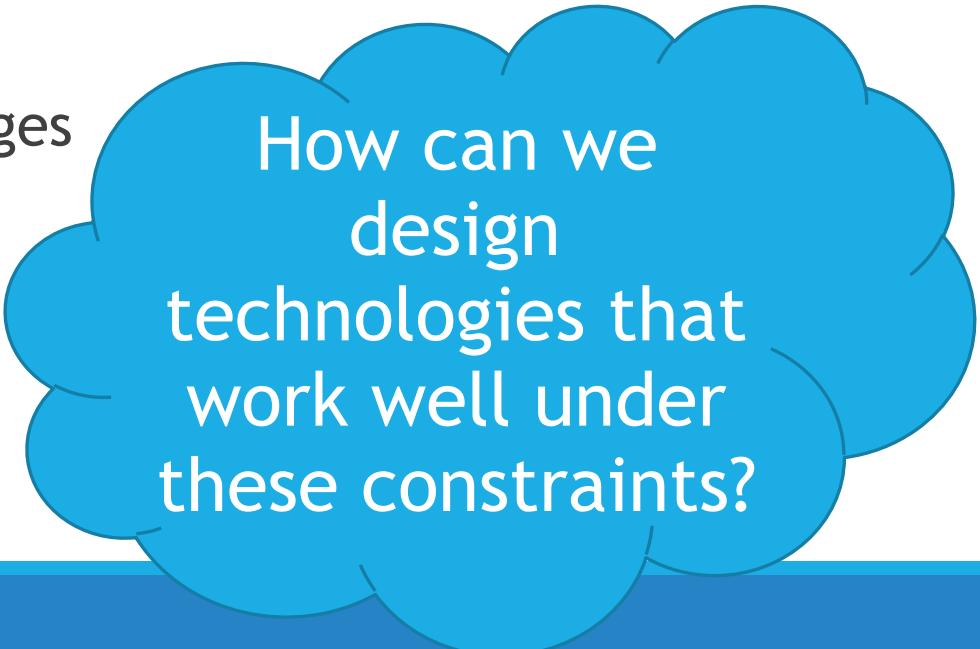Low levels of literacy

Unfamiliar with technology

Linguistic challenges

Social and cultural challenges

Poverty

Political challenges

Many more....

How can we design technologies that work well under these constraints?

In the beginning….

Technology will save the world!

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How technology can help us eliminate, not alleviate, poverty

THE BLOG

Technology to End Extreme Poverty

🕐 09/24/2012 10:48 am ET | **Updated** Nov 24, 2012

Example: One Laptop per Child

Originally the $ 100 Laptop
- Later OLPC, finally XO ($399 for 2)
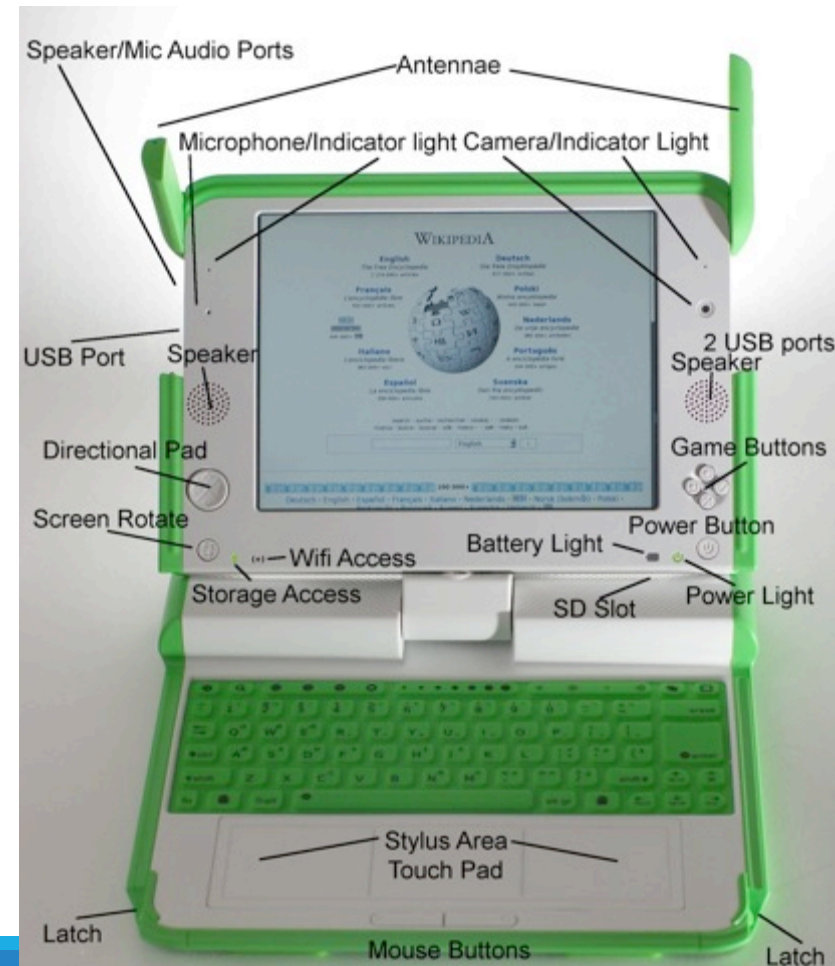
Technological Innovation

Learning approach
- Constructivism
- Take laptops home, play with them

Critiques
- "Little or no sustained and scaled effects on teaching, learning, and achievement" (Bain and Weston)

Problems with OLPC

Technology centric approach – no focus on humans

Did not fit people's actual needs

Did not pay attention to local contexts and challenges

Did not provide on the ground support

Did not plan for sustainability

Bad design!

The Failure of OLPC:

http://hackeducation.com/2012/04/09/the-failure-of-olpc

How can we do better?

Amplification theory
◦ Technology can only amplify human intent (Toyama)

Key idea: Technology on it's own won't do anything

People have to want to change the situation, solve the problem

Example: Digital Green

Problem: Teach poor farmers better farming practices
Solution: Digital Green

    Mediation / Mediator

    Highly formatted, targeted video content

    Contextual content: local presenter, not "well-dressed" scientist

    Supporting organizations on the ground

Outcomes: 55% adoption of new practice over 8% in old system

Why it works

Pays attention to local culture and context

Specifically designed to suit the needs of target population

Gives people tools so they can solve their own problems

Provides support through organizations on the ground

Good design ☺️

Design for Marginalized Communities

Everything you know about good design still applies!
◦ Pay close attention to user needs, understand the context, iterate

Design process often requires extensive fieldwork with target communities to understand the space

The work often requires input from multiple organizations and communities
- Strong partnerships are essential

If done right, there is great potential for positive impact!
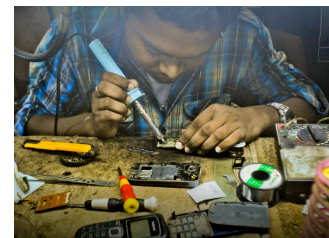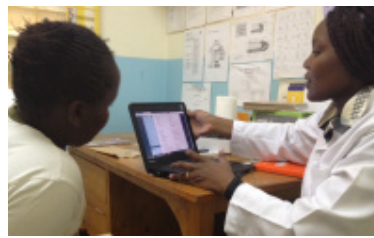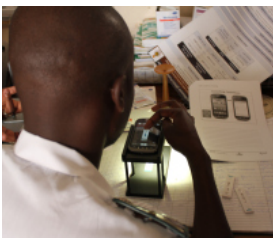
A few example domains

Healthcare
- Low-cost diagnostics and telemedicine
- Disease prevention and education
- Healthcare informatics

Agriculture
- Supply chain efficiencies
- Agricultural education
- Market and pricing information
- Geophysical sensing

Education
- Low cost computing
- Computer sharing
- Distance education

Governance
- Information organization
- Information communication
- Detecting and reporting corruption
- Activism

Design
- Interfaces for low-literacy
- Interfaces for low education
- Assistive technology

Financial services
- Microfinance information
- Mobile money
- Financial literacy

Summary

Global problems	Technology constraints	Diverse challenges
Poverty	Computers	Culture
Education	Cell phones	Gender
Gender equality	Mobile devices	Politics
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- Technology alone is not enough, focus on the humans!
- Everything you have learned about good design/HCI still applies
- BUT the context and complexities are often fundamentally different

Activity (can be done in pairs)

Design and paper prototype a social media application for low-literate people.

- Choose a specific population (country, community)

- Pick a few specific social media-related tasks to prototype

- Add captions/explanations to explain your prototype

Write your name and NetID on your prototype and turn it in.