The Next Ten Years: Designing for Equity & Inclusion

CS Graduate Seminar
Oct. 9, 2015
Deborah Tatar
• Professor of **Computer Science** and by courtesy **Psychology**

• Member, **Program for Women and Gender Studies**

• Member, **Center for Human Computer Interaction**

• Member, **Program for Peace Studies**

• Fellow, **Institute for Creativity, the Arts, and Technology**
Some things I’ve done before

• Logo Lab (MIT)
• Educational Software (Wendy Mackay at DEC)
• Textbook on LISP programming language
• PhD: Interpersonal Attention and Pragmatics of Communication (Stanford)
• Colab Project (Xerox PARC, Lucy Suchman)
• Classroom based educational technology research, (SRI International)
• And lots of other stuff
Current interests

• K-12 Education and Technology

• Understanding and designing for the influence of technological systems on the dynamics of how we see ourselves and others
• This talk is important for all of you.
• I am looking for the few of you that want to work on this.
• I am teaching a 6000-level seminar this spring on Designing to Change Power and Authority.
What is our relationship to computing? What should it be in the future?
The world of computing
The world of computing

has had a lot of utopian thinking.
proponent of the development and use of computers and computer networks to help cope with the world’s increasingly urgent and complex problems. Engelbart embedded a set of organizing principles in his lab, which he termed "bootstrapping". His belief was that when human systems and tool systems were aligned, such that workers spent time "improving their tools for improving their tools" it would lead to an accelerating rate of progress.

Creating a brilliant world one project, team, or organization at a time

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Utopia Project

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The project came to be described as the 'Utopia project' and was mostly concerned with the invention of tools and techniques for electronic communication, hypertext, networked applications, and organisational games. These included a suite of technologies, which formed the basis of hypertext and distributed computing. The project was established in 1968. Engelbart's work on hypertext and computer-supported cooperative work was later to form the basis of the World Wide Web.
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The Xanadu Document Model

- built on the assumption of perpetual change and re-use

A document is delivered as a LIST of contents—virtual files. This is the fundamental form.

Any new content goes into the pool, not into the virtual file.

Content is available as requested by each reader, to fill in the virtual file.

Available Contents

- an ever-growing addressable pool, or indexable carpet

The project came to focus on design-by-doing, like prototypes, mock-ups, and organisational games - leading the graphic workers to put forward wishes in a concrete way and inquiry about the system, this by actually doing page making and picture processing work in the simulated future environment.
The project came to focus on the development of Naps (Never Any Piece of software). The Utopia Project was a collaboration between the Utopia Foundation and the University of California at Berkeley. Engelbart's ideas were influenced by hypertext, networked interfaces, and the invention of the mouse. These ideas were realized in the Xanadu Project in 1968.

Engelbart's vision was to create a system that would allow people to work together on a single document in real-time, with each participant able to edit and add to the document simultaneously. This was a radical departure from the traditional document editing process, which involved creating a draft and then sending it to others for review and feedback. Engelbart's system would allow for a more collaborative and efficient way of working, with instant feedback and real-time updates.

Engelbart's vision was not just about technology, but also about changing the way people worked and communicated. He believed that technology could be a powerful tool for increasing productivity and improving the quality of work. The Utopia Project was an attempt to create a new kind of work environment, one that would be more collaborative, more efficient, and more enjoyable. Unfortunately, the project was never fully realized, but Engelbart's ideas and vision continue to influence the development of technology today.
Utopia Project

The project came to be known as hypertext, networked interfaces. These innovations are the invention of the human computer.

Object-oriented

The Xanadu Design

Object-oriented

The Virtual Community

Homesteading on the Electronic Frontier

Object-oriented programming

The Xerography Document Model

The Virtual Community: Homesteading on the Electronic Frontier (free in HTML form)
Object-oriented programming

The Xanadu Document Model

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The project came to focus on "design by the pool" and "mock-ups and organisational games" through a concrete way and inquiry about the system picture processing work in the simulated future environment.

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LIST OF CONTENTS and how to put them together.

- The Virtual Community
- Homesteading on the Electronic Frontier

Available in HTML form


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Computational Utopias
Computational Utopias

• Many of us came into computing because we hoped to improve the world.

• We were reassured:

  • “The internet promotes democracy!” Howard Rheingold 1994

• and by “democracy”, Americans commonly mean a raft of concepts of good: including equity, inclusion, opportunity, participation, tolerance, and the rule of law.

• Nice!
MIT publishes virtually ALL of its course materials online for free. You can take hundreds of college courses completely free, in your own time.

Please SHARE this amazing resource with everyone you know.

(Note: not students in an MIT class, but “the new middle class in Africa”)

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Mike Chorost: Cyborg
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Please SHARE this article:

Technology-Mediated Parent-Child Intimacy: Designing for Ecuadorian Families Separated by Migration

Mike Chorost: Cyborg

Figure 4. Playing with memory blocks to build a story and keep it in the Memory Jar
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Technology-Mediated Parent-Child Intimacy: Designing for Ecuadorian Families Separated by Migration

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Two current senior HCI Capstone Projects
Certainly, the internet can promote democracy and computing leads to all sorts of good things, but is this *inevitable*?
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“The Enlightenment philosophers who insisted that the world could be improved were right. Voltaire was one of them. The mistake was to think that, once improved, it couldn’t get worse again. Voltaire’s point was not that optimism about mankind’s fate is false. It was that, in the face of a Heaven known to be decidedly unbenevolent, it takes unrelenting, thankless, and mostly ill-rewarded work to cultivate happiness here on earth. … That was the lesson Dr. Pangloss and his students had yet to learn.”

Computer Science is like engine design....

We NOW (mostly) think that car design includes environmental impact.
When we think about the design of our computing systems... we also need to think about their undesirable consequences

and, NOW, would be a good time.
What are some undesirable consequences?
What are some undesirable consequences?

Inequity in Information and Control
To understand the consequences of cars, we have to look at the systems in which they are embedded.

To understand the consequences of computers, we have to look at the systems in which they are embedded.
Human Systems

- Really complicated!
- An example
- Two (related) theories
Amartya Sen
Amartya Sen

Identity and Violence:

• Central to human life are the responsibilities of choice and reasoning.

• Multiple identities lead to choice.

• Single identities lead to misperception of the target, insistence on singular qualities, and the illusion of lack of choice.

• Confinement to single identities leads to resentment and societal violence.

• Classification is cheap but identity is not.
Amartya Sen

*Identity and Violence:*

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- Classification is cheap but identity is not.
What does this have to do with the design of computer systems?
Classification is cheap but identity is not

What are you?

☑️ African-American
☑️ Asian
☑️ Hispanic
☑️ Native American
☑️ Pacific Islander
☑️ White
Classification is cheap but identity is not

What are you?

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- Asian
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- Native American
- Pacific Islander
- White

So, if I am from the middle east where do I fit?
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So, if I am from the middle east where do I fit?

So, if I am from India as compared to China where do I fit?
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So, if I am from the middle east where do I fit?

So, if I am from India as compared to China where do I fit?

What if I never fit anywhere?
Classification is cheap but identity is not

• But this categorization seems so small.

• Can’t we just fix it—after all Facebook just enlarged its gender classifications?

• And people do this kind of categorization without computers.

• So what?
What are some undesirable consequences?

- One kind: the consolidation and rigidity of power in the system
  
  - We might call this: *Human Malleability & Machine Intransigence*
As computer scientists we like clean categories and utilizing the power of the machine.
Undergraduates asked to design learning games are astonished and repelled that a computer-based collaborative crossword puzzle game would fail to tell the players who should go next. “But the computer can tell you!” Further, when asked whether strict alternation of turns is important, they are puzzled. One speaks up, “It’s not fair if people decide who goes next!” The others chime in with agreement. The brute fact of the computer’s ability is prioritized over the ability of the people.
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When asked what is most important about a game, undergraduates say, “To win.” When asked whether that is always the most important thing, they reassert this. But when asked how they would run a footrace with a four-year-old, their view of games and playing changes radically. Suddenly fun is associated with process, with deliberately not winning. The ability to shape the interaction, to have social agency, is important but experienced as remote.
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When cs undergraduates are asked, “If you were to pretend that the computer was a person, what kind of person would it be? What kind of a personality would it have?”, some reply that the computer is rude and domineering, but one woman puts her arms around her laptop open on the desk and says, “I love my computer. It always does what I want it to do.” *The computer’s compliance is seductive and its shallowness often invisible.*
Human Malleability & Machine Intransigence

But this kind of consolidation and rigidity matter because of what we are like and what computers are like.
Part I

• We treat computers like people. (in some sense).
  
  Nass & Reeves

• ... the possibility of treating computers like people is what gives computers their power. We can use our notions of interactivity because computers are:

  • responsive, linguistic, & opaque.

  Suchman
Part II

Our vision of ourselves is shaped by those with whom we interact.

Cooley, 1904: Looking Glass Self
Suchman, 2007: Human Machine Reconfigurations
Part III

- The behavior of most computers most of the time is dominating—bullying—even sociopathic.
- At many levels
- We interact with computers more than people.
So, we come to see ourselves as passive recipients, defined by the “gaze” of the computer.
Now consider
Most People’s Interactions with Computers are Increasingly Confined to a Few Venues

• “While in 2001, the top 10 websites accounted for 31 percent of all page views in America, by 2010 the top 10 accounted for 75 percent.

• Google and Facebook are now the first stops for many Americans seeking news — while Internet traffic to much of the nation’s newspapers, network television and other news gathering agencies has fallen well below 50 percent of all traffic. Meanwhile,

• Amazon is now the first stop for almost a third of all American consumers seeking to buy anything.”

Robert Reich, NYT’s, Sept. 18, 2015:

• Users must accept or reject computer systems as a totality.
• And we have no realistic choice about using many systems.
  • Note how VT just moved all list-servs to Google….
Preliminary list of high level principles

• develop ways to talk back, correct & modify

• develop ways to assert ourselves, our boundaries, and our identities in our own terms

• insist on reciprocity and the unpacking of causation

• design un-algorithms / unpack conclusions even (especially) in the design of harmless systems
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Critisearch: a way of correcting Google without getting distracted

Michael Stewart
Critisearch
Critisearch

Torgersen

Former Virginia Tech President Paul Torgersen dies - Richmond.com
www.richmond.com
Mar 30, 2015 ... Former Virginia Tech President Paul Torgersen, credited with fostering the school's emergence as the 21st century model of a land-grant ...

Torgersen, Dorothea - Roanoke Times: Obituaries
www.roanoke.com
Sep 29, 2014 ... Torgersen Dorothea Dorothea "Dot" Torgersen, 84, of Blacksburg, died Saturday, September 27, 2014 at Roanoke Memorial Hospital. She was ...

Police investigate bomb threat in Torgersen Hall; students ...
www.collegetimes.com
Sep 22, 2015 ... A police K-9 unit was called in to investigate a bomb threat at Torgersen Hall. Students, faculty and staff had been evacuated from the building.

Torgersen Hall | Virginia Tech | Virginia Tech
Called the Advanced Communications and Information Technology Center in the building proposal and during construction, Torgersen includes 30 miles of ...
CoListen

• Who is to say that we have to listen by ourselves?

LISTEN

CO-LISTEN

JOIN

LOOK

Michael Stewart
Preliminary list of high level principles

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• develop ways to assert ourselves, our boundaries, and our identities in our own terms

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Shared Calendars: Boundaries

• People will use shared calendars if we set organizational sharing as the default!

• That gets them to use the groupware!

• Now, what happens to parents’ careers?

• If parents are perceived as more devoted to their children, they suffer career consequences, especially women.
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• insist on *reciprocity* and the *unpacking of causation*

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Insist on Reciprocity

- How come “they” can know about “us” but we can’t know about them?
Insist on Reciprocity
Insist on Reciprocity

Fig. 2: The Turkopticon browser add-on adds information about requesters provided by other workers.
Preliminary list of high level principles

- develop ways to talk back, correct & modify
- develop ways to assert ourselves, our boundaries, and our identities in our own terms
- insist on reciprocity and the unpacking of causation
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• A Databox assists in provision of:
• **Legibility:** inspect and reflect on “our” data, to understand what is being collected and how it is processed.
• **Agency:** manage “our” data and access to it, enabling us to act effectively in these systems as we see fit.
• **Negotiability:** navigate data’s social aspects, by interacting with other data subjects and their policies.
Lots more examples from many sources

Lots more examples from many sources


But not enough
• If we do not explore these paths, who will?

• Who will set boundaries?

• If we do not maintain an active and proactive stance towards the design of technology, we will suffer in our lives.

• And we will be surprised by anger and violence directed against us.
... as Jordan Crandall (2005, 3) has argued, the current age of panoptic data processing means that Western nations increasingly wage war through what he calls “processual infrastructures”. Integrating the capabilities of digital sensors to sustain “strategic seeing” and “persistent surveillance”, military command and control systems increasingly delegate decisions to track, surveil, and target to the computer algorithms that connect such sensor systems to computer databases.

• Utopian principles have guided computer science research in the past.

• And have led to many important, wonderful and beneficial outcomes.

• And we could use some Utopian thinking just about now because

_The Enlightenment philosophers who insisted that the world could be improved were right.… The mistake was to think that, once improved, it couldn’t get worse again._
The Enlightenment philosophers who insisted that the world could be improved were right…. The mistake was to think that, once improved, it couldn’t get worse again.
CS6724 seminar next semester:
Designing to Change Power and Authority

Why build a system unless there is something that you want to do differently? Computer Scientists build systems to change things in the world. But as computer systems touch more and more aspects of life, it is not just all about efficiency. It’s very easy to design systems that get users to interact with computers in a way that satisfies some set of narrow goals, but the cost may be that we are constrained and even bullied by our systems. As recently 1994, Howard Rheingold claimed that the “internet promotes democracy,” yet the ensuing 20+ years have begun to reveal more complex patterns, starting with the observation that we must be concerned now not with “the” internet, but with “this” internet [Dourish, 2015]. In a recent New York Times op-ed, Robert Reich ( Former Secretary of Labor under President Clinton) notes that “while in 2001, the top 10 websites accounted for 31 percent of all page views in America, by 2010 the top 10 accounted for 75 percent” [Reich, NYT, 9/18/15]. Likewise, “Amazon is now the first stop for almost a third of all American consumers seeking to purchase anything.” As Reich goes on to say, “Talk about power.”

But the power of computer technology in society does not just lie at these institutional levels. It also lies in the ways that habitual practices in design result in the creation of computational systems that demand and reinforce ritualized behavior in the users. We can and ought to design differently! We can design to promote equity, inclusion, and freedom of action.

This project-based class designs and implements, taking into consideration such current movements as participatory design, critical design, adversarial design, feminist design, as well as Dr. Tatar’s own understanding of the challenges that face the knowledge society in the next ten years. We will design systems to promote equity and inclusion, and we will inform our design activity with (1) an understanding of who and how people are currently marginalized and (2) design propositions about what we can do differently.
Thank you.

• Questions? Thoughts?
• Talk to me: dtatar@cs.vt.edu