Week 3: Value-Sensitive Design

Ethics in NLP: Including Society in Discourse and Design January 24th, 2019 Ryan Georgi







Human-Computer Interface (HCI) Design: **A Brief Introduction**

- Until late 1970s, only people who really used computers were specialists
 - "Usability" wasn't a concern, if you were expect as a specialist to work with the system as it was
- Personal computing became a paradigmatic shift
 - Computers were a different type of "tool"
 - They could be repurposed at will through software
 - Required new interdisciplinary study on how people interacted with these new "tools"





Human-Computer Interface (HCI) Design: **A Brief Introduction**

- Domain of scholarship on best way to design computer systems for human interaction
 - Activity Theory
 - User-Centered Design
 - Principles of User Interface Design
 - Value Sensitive Design







Human-Computer Interface (HCI) Design: **A Brief Introduction**

- Typically through a *user study*
 - Talk to users and identify pain points
 - How would an interactive computer system help these users do their jobs better? More easily? etc.
 - Prototype a design and **get user** feedback
 - Deploy once you can validate that the system achieves the goal of helping users accomplish the specified task

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• (Most of) these design principles involve starting with a *user-informed* design



- <u>Shneiderman's Eight Golden Rules</u>
- Norman's Seven Principles
- <u>Nielsen's Ten Heuristic Principles</u>



Design Principles





Design Principles: Nielsen's Ten Heuristic Principles

• Visibility of system status.

Match between system and real world.

terms. Follow real-world conventions, making information appear in a natural and logical order.

• User control and freedom.

without having to go through an extended dialogue. Support undo and redo.

• Consistency and standards.

Error prevention.



• The system should always keep users informed about what is going on, through appropriate feedback within reasonable time.

• The system should speak the users' language, with words, phrases and concepts familiar to the user, rather than system-oriented

• Users often choose system functions by mistake and will need a clearly marked "emergency exit" to leave the unwanted state

• Users should not have to wonder whether different words, situations, or actions mean the same thing. Follow platform conventions.

• Even better than good error messages is a careful design which prevents a problem from occurring in the first place. Either eliminate error-prone conditions or check for them and present users with a confirmation option before they commit to the action.





Design Principles: Nielsen's Ten Heuristic Principles

• **Recognition rather than Recall.**

• Flexibility and efficiency of use.

both inexperienced and experienced users. Allow users to tailor frequent actions.

• Aesthetic and minimalist design.

with the relevant units of information and diminishes their relative visibility.

• Help, diagnosis and recovery from errors.

Documentation and Help

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• Minimize the user's memory load by making objects, actions, and options visible. The user should not have to remember information from one part of the dialogue to another. Instructions for use of the system should be visible or easily retrievable whenever appropriate.

• Accelerators — unseen by the novice user — may often speed up the interaction for the expert user such that the system can cater to

• Dialogues should not contain information which is irrelevant or rarely needed. Every extra unit of information in a dialogue competes

• Error messages should be expressed in plain language (no codes), precisely indicate the problem, and constructively suggest a solution.

• Even though it is better if the system can be used without documentation, it may be necessary to provide help and documentation. Any such information should be easy to search, focused on the user's task, list concrete steps to be carried out, and not be too large.





Value Sensitive Design

- One of the leading scholars is <u>Batya Friedman</u>, who leads a lab here at UW's iSchool.
 - vsdesign.org
 - High-level approach for design techniques for interactive computer systems





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Value Sensitive Design: Key Theoretical Components

- Interactional Theory
- Tripartite Methodology
- Direct & Indirect Stakeholders
- Value Tensions
- "Progress, not Perfection"







Value Sensitive Design: Interactional Theory

shape (but do not rigidly determine) individual behavior and social systems.

Via <u>vsdesign.org/projects.shtml</u>, emphasis mine

autonomy community cooperation democratization

environmental sustainability fairness human dignity inclusivity and exclusivity



• Values are viewed neither as inscribed into technology nor as simply transmitted by social forces. Rather, people and social systems affect technological development, and technologies

• System designers should not only think of the technical design, but also values:

informed consent justice privacy self efficacy

security trust

more...

See Friedman & Kahn (2006) for more





Value Sensitive Design: Interactional Theory

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autonomy community cooperation democratization

...could Apple used its marketing/design expertise to try and persuade consumers that it was desirable to pass on their products as heirlooms, and build products with an eye towards 20-year life cycles? WASHINGTON

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• System designers should not only think of the technical design, but also values:

| environmental sustainability | informed consent | security |
|------------------------------|------------------|----------|
| fairness | justice | trust |
| human dignity | privacy | more |
| inclusivity and exclusivity | self efficacy | |

See Friedman & Kahn (2006) for more



Value Sensitive Design: Tripartite Methodology

Conceptual Investigations

• Analytic, theoretical, philosophical explorations

• Empirical Investigations

- Human context in which technology is situated
- (Typical HCI approaches, to some extent)

Technical Investigations

- Technology as the unit of analysis
- Analysis of existing technology, design of new technology

Value Sensitive Design: Direct & Indirect Stakeholders

Direct Stakeholders

- technology" (Nathan et. al, 2008)

Indirect Stakeholders

- impacted by it

• "individuals who fill the roles that the design was created for and are in direct contact with a

• e.g. Hospital personnel and administrators of an electronic health record system

• Individuals who may never directly interact with the system, but are still affected by it • e.g. Patients, families of patients who never interact with the system, but who are

- - Privacy vs. Security
 - Autonomy vs. Fairness
 - Autonomy vs. Community
- Priority of different values may even change over time

Value Sensitive Design:

Value Tensions

• When taking values into design, sometimes there are conflicts (or "tensions")

Value Sensitive Design: Progress, not Perfection

- VSD doesn't suggest tech designers are omniscient
- It's impossible to know the full complexity of interactions that will impact your design
- ...but it's harder to know when you haven't tried thinking about it!

Value Scenarios

Value Scenarios:

- Literature:
 - Interactive System Design
 - New Technologies
 - and Technical Imaginations.

A Technique for Envisioning Systemic Effects of New Technologies

• Nathan et. al (2008). Envisioning Systemic Effects on Persons and Society Throughout

• Nathan et. al (2007). Value Scenarios: A Technique for Envisioning Systemic Effects of

• Friedman & Hendry (2012). The Envisioning Cards: A Toolkit for Catalyzing Humanistic

Value Scenarios:

A Technique for Envisioning Systemic Effects of New Technologies

- Value scenarios & envisioning
 - Framework for trying to spur thinking about design choices and impacts
 - Draws upon a deal of previous work:
 - Urban Planning
 - Design Noir
 - Value Sensitive Design

Urban Planning

- Urban planners focus on multiple-lifetime timeframes
- Nathan et. al (2008) give example of Central Park in NYC
 - [Olmstead] held that it was the responsibility of landscape architects to satisfy deep human needs for slightly wild, pastoral landscapes and vistas

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Urban Planning

- ...also worth noting that Central park wasn't empty land at the time.
 - It was the location of Seneca Village (Drusus, 2015)
 - A working-class black neighborhood
 - City exercised imminent domain to seize land

• ...and didn't have much political liability from the largely unenfranchised population

- Concept from designers Anthony Dunne & Fiona Raby
 - ... I'd call it conceptual art, but they don't:

It is definitely not art. It might borrow heavily from art in terms of methods and approaches but that's it. We expect art to be shocking and extreme. Critical Design needs to be closer to the everyday, that's where its power to disturb comes from. Too weird and it will be dismissed as art, too normal and it will be effortlessly assimilated. If it is regarded as art it is easier to deal with, but if it remains as design it is more disturbing, it suggests that the everyday as we know it could be different, that things could change.

From Critical Design FAQ

2. Compass table

This table reminds you that electronic objects extend beyond their visible limits. The 25 compasses set into its surface twitch and spin when objects like mobile phones or laptop computers are placed on it. The twitching needles can be interpreted as being either sinister or charming, depending on the viewer Is state of mind. When we designed the compass table, we wondered if a neat-freak might try to make all the needles line up, ignoring the architectural space of the room in favor of the Earth's magnetic field.

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3. Nipple chair

An electric field sensor and antenna are mounted beneath the seat of the chair. When the chair is placed in an electromagnetic field, two nipples set into the back start to vibrate, and the sitter is made aware of the radio waves penetrating their torso. It is up to them whether they stay and enjoy the gentle buzz, or move to a quieter spot. As fields can also flow up through the sitter's body from electric wiring running underneath the floor, the chair has footrests so that you can isolate your feet from the ground. We like that it is slightly anthropomorphic; it's as though you are sitting on its lap.

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- What <u>Nathan et. al (2008)</u> take from this:
 - we drew on design noir's consideration of human beings as fundamentally clever, creative, and adaptive (not just task-directed, goal-oriented users) which leads to:
 - 1. unusual appropriations of a design, and
 - 2. potential for dark uses of a design
- This should be used to inspire designers to think of both:
 - Unintended malicious use

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Unintended constructive use

Envisioning: Criteria

- Stakeholders
 - Time
 - Values
- Pervasiveness

Envisioning: Time

- Inspired by long-term nature of urban planning
- ...what are the impacts of a system over 3, 5, 10+ years?

Envisioning: Pervasiveness

- How does the nature of the technolo of society?
 - ...by different cultural groups?
 - ...in unintended ways?

• How does the nature of the technology change as it is adopted by larger groups

Stakeholders Example: Apache III

- life support.
- **Direct Stakeholders**
 - Targeted Roles
 - Physicians, insurance reps, nurses
 - Non-Targeted Roles
 - Cost-cutting administrators, hospital performance evaluators
- **Indirect Stakeholders**
 - Patients, patient caretakers

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Medical decision support system. Typically used for decisions around withdrawing

Exercise: Scenario Envisioning

• Consider the following NLP design challenge:

- conversations between their representatives and customers.
- center agents, and what customers are wanting/saying/feeling.
- get transferred with an agent and customer on the same line.
 - two voices that might be using the same line.
- Think of both the overall specific scenario (ASR for call centers) as well as automatic speech gender/age detection as a

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• A company that runs call centers wants to use automatic speech recognition to transcribe

• They want to use these transcripts for better visibility into both the behavior of call

• Usually, the voices of agent and customer are on two separate lines, but sometimes calls

• They are thinking of using acoustic cues that correlate with gender and age to distinguish

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Exercise: Scenario Envisioning

• Consider the following NLP design challenge:

- A system is being designed to detect abusive language online.
- It is intended primarily for detection, but might be able to be used for generation.

