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# Computing Ethics Values in Design

*Focusing on socio-technical design with values as a critical component in the design process.*

VALUES OFTEN PLAY OUT in information technologies as disasters needing management. When Facebook started sharing data about what people were buying or viewing, it ended up with digital egg all over its face. Focusing the initial design process on complicated values of privacy might have helped Facebook avoid this uproar. To use another example, the “terms and conditions” that most users simply “accept” without reading could be made easier to read and understand if the values inherent in fair contracting were incorporated in the design of such agreements in the first place. But conversations and analyses of the values found in technologies are generally engaged after design and launch, and most users are faced with a daunting set

of decisions already made on their behalf (and often not to their benefit) and impossible choices if they would like to do things differently. Sensible responses to this problem have been developed over the past 10 years, and a community of researchers has formed around the role of human values in technology design.<sup>a</sup> A new book on Values in Design from the MIT Press *Infrastructures* series illustrates the issues.

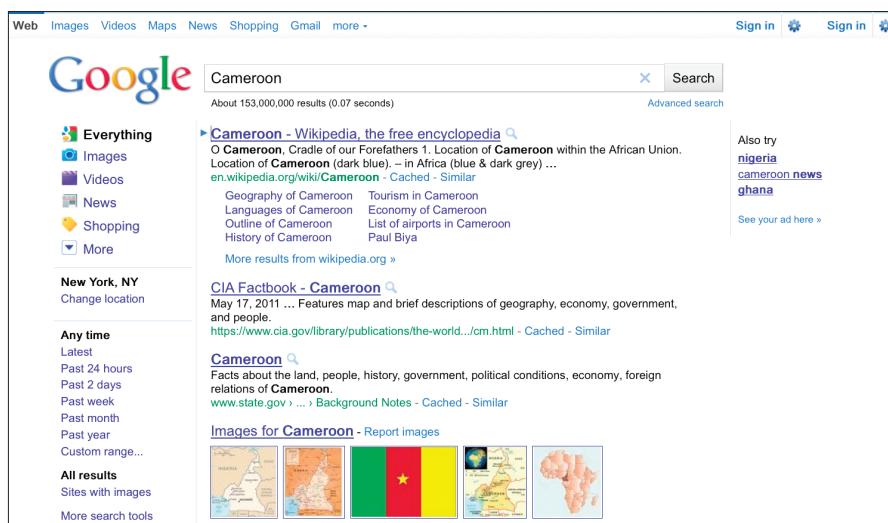
Helen Nissenbaum has created a Values in Design Council, working with the National Science Foundation on the Futures of Internet Architecture (FIA)

<sup>a</sup> Examples of existing work in along this theme include Batya Friedman’s *values-sensitive design*, Mary Flanagan and Helen Nissenbaum’s *Values at Play*, Phoebe Sengers’ *reflective design*, T.L. Taylor’s *values in design* in ludic systems, and Ann Cavoukian’s *privacy by design*.

research program (see [http://www.nyu.edu/projects/nissenbaum/vid\\_council.html](http://www.nyu.edu/projects/nissenbaum/vid_council.html)). This suite of projects is aimed at redesigning Internet architecture to handle ever-expanding modes of usage with fewer problems due to design mistakes about values. An initial meeting of people from these projects revealed three values that need immediate attention. One involves the trade-off between security and privacy: for example, can we design computing “clouds” so that search queries cannot be traced to an individual user or IP except in carefully controlled circumstances subject to appropriate prior review. Not surprisingly, the U.S. National Security Agency wants to maintain loopholes that allow it to pursue the important value of national security. Can these values be reconciled through a compromise design? Another involves hardware design for Digital Rights Management (DRM) that protects digital rights while permitting flexibility as information policy evolves. A third concern, “cultural valence,” means systems designed by one group (for example, Americans) should not impose American values about structure, protocol, use, and policy on non-Americans as Internet architectures go global. The point is not that designers have the *wrong* values, but that one of the key features of values is that different people hold different values, and often hold to those values very strongly.

## Infrastructures and Values

Successful infrastructures serve people with different values. A good example of this is mobile technologies.



The image shows a screenshot of a Google search for "Cameroon". The search bar at the top contains the word "Cameroon" and a search button. Below the search bar, it indicates "About 153,000,000 results (0.07 seconds)". The main search results are listed below, starting with "Cameroon - Wikipedia, the free encyclopedia". To the left of the search results is a sidebar with navigation options: "Everything", "Images", "Videos", "News", "Shopping", and "More". Below the sidebar, there are filters for "New York, NY", "Any time", and "All results". At the bottom of the search results, there are several small images related to Cameroon, including a map and the national flag.

Figure 1. Results of a Google search on “Cameroon.”



**Figure 2.** Designer Mary Flanagan's reconceptualized classic Atari video games with giant joystick; <http://www.maryflanagan.com/giant-joystick>.

Inclusion of GPS capability creates new opportunities regarding information tied to geography. Mobile applications coupled to social networks allow users to know when they are near friends. Loopt and FourSquare<sup>b</sup> show where friends have “checked in” and their distances from a user’s current location to facilitate social gathering and serendipitous meeting. However, such technologies can cause tension in social values as the benefit of potential meetings with friends causes problems of attention and interrogation, as when a paramour says, “You said you were going to the store, then the library, and then home, but you never checked in. *Where were you?*” a GPS-based network applications may increase locational accountability because, unlike a phone call that might originate anywhere, GPS-enabled applications carry information about specific geographic location. In principle, a user can work around “stalking” and other problematic situations with some mobile apps such as Tall Tales and Google Latitude<sup>c</sup> that allow a user to lie about location, but equating privacy with lying creates its own values-centric problems. An “open hand” of location-based transparency can easily become a “backhand” when

geographic privacy and autonomy are compromised.

Another good example of value clashes concerns search engines. Google might be the greatest information retrieval tool in world history, but it falls prey to the “Matthew effect” named for a line in the Gospel of Matthew (25:29): “For to all those who have, more will be given, and they will have an abundance; but from those who have nothing, even what they have will be taken away.” The results of a simple Google search on the word “Cameroon” shown in Figure 1 indicate Wikipedia, the CIA, the U.S. State Department, and the BBC seem to know more about Cameroon than any of its inhabitants. The highest-ranked site from the country does not appear until page 4, a link to the country’s main newspaper. Given that most users never go beyond the first few links,<sup>d</sup> few will get to information about Cameroon *from* Cameroon. The country is officially French-speaking, so sophisticated searchers might find better results searching for “Cameroon,” but few English-speaking users would do this. The algorithm that provides nearly universal access to knowledge also unwittingly suppresses knowledge of African countries. Or is this always unwitting? A search on “Obamacare” produces a taxpayer-paid-for link to <http://www.healthcare.gov> as a top hit.<sup>1</sup>

### Interdisciplinary Scholars

A community of scholars has formed

around VID, or Values in Design (or more formally, Values in the Design of Information Systems and Technology). It consists of researchers and practitioners in computer science, engineering, human-computer interaction, science and technology studies, anthropology, communications, law, philosophy, information science, and art and design. They find common ground through the interdisciplinarity implied by the broad spectrum of interests. Decades of research in the sociology of science and technology have shown that technical infrastructures reveal human values most often through counterproductivity, tension, or failure. Workshops conducted over the past six years by Helen Nissenbaum, Geoffrey Bowker, and Susan Leigh Star have sparked conversations among people in these fields, producing a cohort of interdisciplinary scholars of values in design. This group departs from a traditional view of critical theory that tackles technology once it is in place, and focuses instead on socio-technical design with values as a critical component in the design process. The objective of VID is to create infrastructures that produce less friction over values than those created in the past. This objective is timely given the rise of social computing and networks, games that address social problems and change (see <http://www.gamesforchange.org/>) and the interconnection of corporate, government, and academic institutions’ interests ranging from the individual to the transglobal.

<sup>b</sup> With over 4 million and 6.5 million registered users as of February 2011, respectively; see <http://about.loopt.com/tag/loopt/> and <http://foursquare.com/about>.

<sup>c</sup> <http://itunes.apple.com/us/app/tall-tales-geolocation-spoofing/>; <http://mashable.com/2009/02/04/google-latitude/>; [http://www.androidzoom.com/android\\_applications/fake%20locations](http://www.androidzoom.com/android_applications/fake%20locations)

<sup>d</sup> <http://seoblackhat.com/2006/08/11/tool-clicks-by-rank-in-google-yahoo-msn/>

# ACM Transactions on Accessible Computing



This quarterly publication is a quarterly journal that publishes refereed articles addressing issues of computing as it impacts the lives of people with disabilities. The journal will be of particular interest to SIGACCESS members and delegates to its affiliated conference (i.e., ASSETS), as well as other international accessibility conferences.

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Association for  
Computing Machinery

VID aims to create a new field that understands values and technology in the early stages of design.

The VID program depends on having sensible definitions for the terms “values” and “design.” The philosopher of science Jacob Metcalf provides a useful framing for “values” by comparing it with generally well-understood concept of *ethics*. Ethics are a set of prescriptions (nouns), while values are tied to action (verbs). VID is a call to action, an effort in “verbing” design work by practical exercises. Exercises include background readings in computer and information science and information policy literatures. Exercises also include use of Mary Flanagan’s *Values at Play* cards to modify or create new values-driven computer games, or Batya Friedman’s *Envisioning* cards to reveal social sensitivities during the design process.<sup>6</sup> Workshop groups are split into interdisciplinary teams that produce a values-driven design in about one week. Academics and industry experts judge the proposals, which have ranged from a system to support community gardening projects and green space development, to a geocaching system that reveals the geographic routes by which kidnapped women are trafficked into the sex trade.

## Conclusion

The VID effort has been under way for 15 years since first articulated,<sup>2-4</sup> and for six years at building the cadre of scholars through workshops. Next steps are to open the design space through collaborative interdisciplinary work; in contrast to customary university training that teaches how to work individually. The world demands skills in collaboration, and future designers must work in highly connected and intellectually fertile environments. The VID community sees design as a process in which constraints impose new directions for innovation, and values are a source of constraints. The VID community is rethinking design to go beyond user studies, marketing, documentation, programming, and

e [http://www.valuesatplay.org/?page\\_id=6](http://www.valuesatplay.org/?page_id=6) and Friedman, B., Nathan, L. P., Kane, S., and Lin, J. *Envisioning Cards. Value Sensitive Design Research Lab*. The Information School, University of Washington. Seattle, WA, 2011; <http://www.envisioningcards.com>

## Design must be integrated in ways that challenge assumptions about what can and cannot be changed.

implementation to actual engagement where the rubber truly hits the road. Design must be integrated in ways that challenge assumptions about what can and cannot be changed. A newly forming Center for Values in Design at the University of Pittsburgh’s School of Information Sciences will explore and apply these ideas as they emerge (see <http://vid.pitt.edu/>).

To close, consider the work of theorist, artist, and designer Mary Flanagan (see <http://www.maryflanagan.com/giant-joystick>). She has reconceptualized classic Atari video games by replacing the single-user, joystick-and-fire button control with a 10-foot high mechanism that requires collaboration and coordination among several people to operate the game (see Figure 2). She subverts design by taking a nontraditional perspective that produces radical reinterpretations of everyday practice. She shows that the social values of collaboration, cooperation, coordination, and play can transform a taken-for-granted utility, the simple joystick, into an opportunity for engagement and discourse about the design of information technologies. **C**

## References

1. Diaz, A. Through the Google Goggles: Sociopolitical bias in search engine design. In *Web Search: Multidisciplinary Perspectives*. A. Spink and M. Zimmer, Eds., Springer New York, 2008.
2. Flanagan, M., Howe, D., and Nissenbaum, H. *Values in Design: Theory and Practice*. Working Paper, 2005.
3. Friedman, B., and Nissenbaum, H. Bias in computer systems. *ACM Transactions on Information Systems* 14, 3 (1996), 330–347.
4. Sengers, P., Boehner, K., David, S., and Kay, J. Reflective design. In *Proceedings of the 4th Decennial ACM Conference on Critical Computing*. (2005).

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