

QUESTION 1

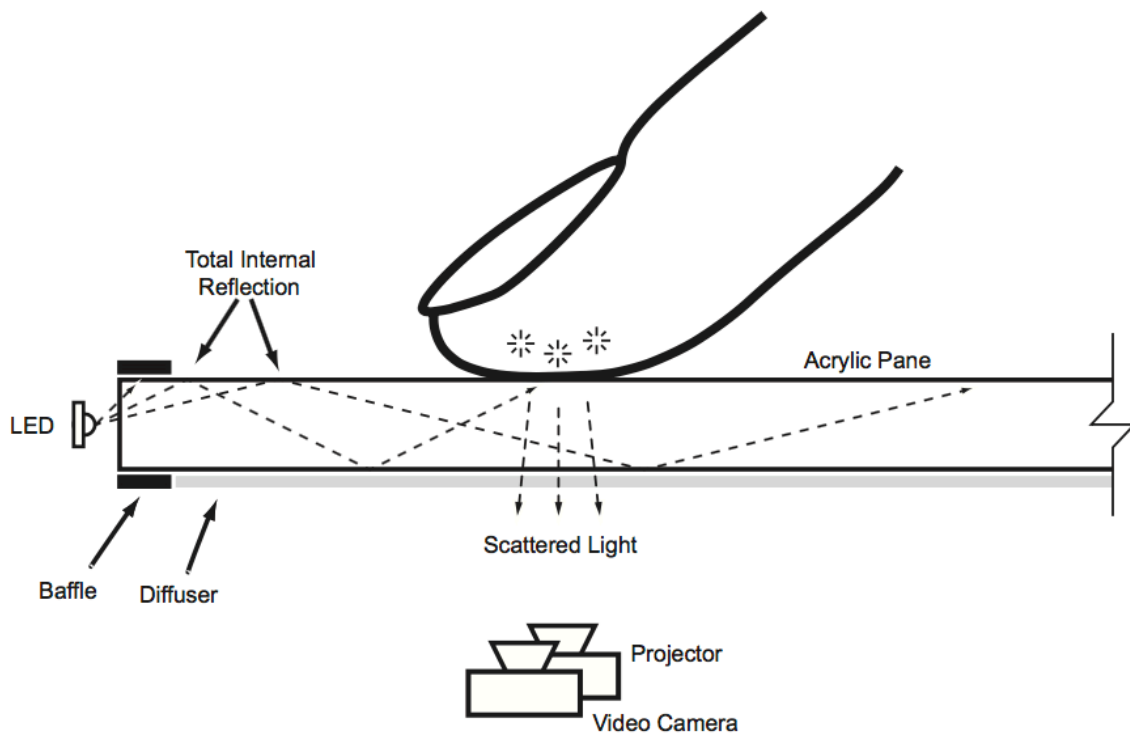
Jefferson Y. Han. 2005. Low-cost multi-touch sensing through frustrated total internal reflection. In Proceedings of the 18th annual ACM symposium on User interface software and technology (UIST '05). ACM, New York, NY, USA, 115-118. DOI=<http://dx.doi.org/10.1145/1095034.1095054>

What is the underlying sensing technology used by Jef Han in his 2005 Multi-touch system?

Frustrated total internal reflection (FTIR) — when light encounters an interface to a medium with a lower index of refraction (i.e. glass to air), the light becomes refracted to at a certain point (i.e. Critical angle) it undergoes total internal reflection. When another material is at the interface it can frustrate this internal reflection and cause light to escape the waveguide there instead.

Extra note — this was not a new technique but because of new advances in machine vision the concept became interesting to explore again.

Can you draw a picture of the technique and how it works?



What is the advantage of this technique over other multitouch techniques of the time?

Existing systems required many connections in an array

Existing systems are often opaque requiring top-projection for integration with graphic display

Expensive — NxN array of sensors means cost of display scales with size of display

What are some limitations of this multi-touch technique?

Limited Information — no idea what finger is touching

Only works with skin (i.e. not objects or stylus) also may not work well with gloves

Cannot discriminate unique users touching or which finger or hand is touching

Requires area for projector and camera behind screen (bulky)

No (or difficult) to get at degree of pressure of touch (may be hysteresis)

No proximity (such as hover). Touch only.

QUESTION 02

Jim Hollan and Scott Stornetta. 1992. Beyond being there. In Proceedings of the SIGCHI Conference on Human Factors in Computing Systems (CHI '92), Penny Bauersfeld, John Bennett, and Gene Lynch (Eds.). ACM, New York, NY, USA, 119-125. DOI=<http://dx.doi.org/10.1145/142750.142769>

What is the premise of the 1992 paper and term "Beyond Being There" by Jim Hollan and Scott Stornetta

Beyond Being There was a research project at Bell Communications Research in 1991 and 1992. Its key insight was that computer and communications technology cannot in the foreseeable future achieve the same quality of human interaction as that afforded by PPR (physically proximate reality - the paper's somewhat obscure term for meeting in person). Thus, while most other projects aimed at ever-higher communication bandwidths and higher-fidelity video, this paper aimed at making computers help people communicate in ways that cannot be done in PPR (for example, anonymous interactions). In other words, they wanted to be better than reality and move beyond being there!

Focus on information richness over imitation of face-to-face communication. Identify and acknowledge strengths (and weaknesses) of various Computer Mediated Communication mechanisms (i.e. email, chat, sms, etc). Looking at non-imitative approaches that focus on underlying requirements and the distinctive characteristics of the electronic media rather than on imitation of the mechanisms of face-to-face might lead to better solutions. This can lead to designs that provide greater information richness than face-to-face for specific communication types and can thus become a preferred communication mechanism when individuals are physically proximate — thus "beyond being there".

Computationally-mediated communication is a new medium, potentially as good or better than the physically proximate medium we are used to. It is thus crucial to consider what mechanisms of communication the new computational medium enables and to realize that mechanisms that may be effective in face-to-face interactions might be awkward or ineffective if we try to replicate them in an electronic medium. This is one of the inherent limitations in imitating one medium

with another.

A better way to solve the telecommunication is to not focus on the tele- part, but the communication part. That is, to make the new medium satisfy the needs of communication so well that people, whether physically proximate or not, prefer to use it.

This approach leads one to consider other elaborations of CMC (i.e. email) that are not at all imitative, but move in complementary or even opposite directions.

Expanding on the "Beyond Being There" concept, what are some mechanisms that a computer mediated communication systems can go "beyond being there" when compared to the unassisted face-to-face interactions?

Anonymity

Asynchronous

Archive — Automatically archive communication / also make it searchable

Clarity — ie. Sign language uses pointing reference a person rather than "he" or "she" which could be ambiguous

Feedback — F2F uses many non-verbal cues but may be ambiguous...a person could give more direct and guided feedback about level of understanding, comprehension, or concerns via a tablet interface for example during a lecture

Also:

One of the other inventions of the Beyond project was the ephemeral interest group. An ephemeral interest group is a discussion group that is linked to some originating information object (e.g., a news article or a web page) and consists of comments and follow-ups on the original information. Unlike web pages, bulletin boards, netnews groups, and mailing lists, ephemeral interest groups can be created at virtually no transaction cost to users or to system administrators. The groups can be thought of as disposable, intended to last only days or hours.

