[Bio follows the Proposal]

Several challenges for the CRA Conference
on "Grand Research Challenges"
Gordon Bell

In his 2001 Turing lecture, Jim Gray www.research.microsoft.com/~gray posited a dozen long term research goals:

- Arbitrary hardware and software scalability over a range of 10^6
- The Turing test, including tests based on prosthetic hearing, speech and vision
- Bush's Personal Memex and a World Memex
- Telepresence
- Trouble-free, secure, and always up computers *that several believe can be built*
- 1000X gain in programmer productivity

One worthwhile task for the Conference could be to look at the 12 in terms of the various research enablers, impediments, and challenges to reach such goals.

My favorite research goals center around three of the above: Personal and World Memex, and Telepresence. They all deal with capture, storage, transmission, and manipulation of all forms of media. Telepresence enables the arbitrary substitution of all sizes and shapes of tele-gatherings and telework for physical presence. Applications range from education and health to all forms of meetings. Both Memexes are critical in an expanding content world. We need to understand our lack of success in Digital Libraries in light of heavy government funding. To date, eBooks also lack success.

Research on the three is likely to be fruitful because they are fundamental applications and we know the users -- they are us. Building tools for ourselves e.g. timesharing, GUI, mail, www has served research well. "All of human history, adequately examined, in the end is the history of better tools." Ernst Kapp,1877

Research focused on helping other disciplines in various ways, including *building tools* is likely to be richer, more rewarding, more useful and have the most impact on computer science. Jim Gray's work with the astronomy community http://skyserver.org to integrate distributed astronomic data into a single, virtual observatory is an example. Nearly every area of science has disparate and incompatible data and models that limit progress. Outwardly focused, cross-disciplinary research would enrich computer science, and get it out of the "computer science research is incremental" *and dull* doldrums.

Bio

Gordon Bell is a senior researcher in Microsoft's [Media Presence Research Group](#) - a part of the [Bay Area Research Center (BARC)](#) and a computer-consultant-at-large working with startup ventures.

Gordon has long evangelized scalable systems starting with his interest in multiprocessors (mP) beginning in 1965 with the design of Digital's PDP-6, PDP-10's antecedent, one of the first mPs and the first timesharing computer. He continues this interest with various talks about trends in future supercomputing (see Papers …presentations, etc.) and especially clustered systems formed from cost-effective "personal computers." As Digital's VP of R&D he was responsible for the VAX Computing Environment.

Gordon has been focused on the use of computers and the necessity of **telepresence**: *being there without really being there, then.* "There" can be a different place, right now, or a compressed and different time (a presentation or recording of an earlier event). In 1999 this project was extended to include multimedia in the home ([visit Papers… presentations, etc](#).).

He is putting all of his atom- and electron-based bits in his local Cyberspace. It is called by MyLifeBits aka MyMainBrain, *the successor to the Cyber All project*. This includes everything he has accumulated, written, photographed, presented, and owns (e.g. CDs).

This project has also stimulated interest in a [CyberMuseum](#), as a part of [The Computer History Museum](#) located at Moffett Field, Mountain View CA. (see also extended bio regarding the museum). [CyberMuseum](#) contents that might be of interest include: Bell's books, the Hollerith Patent, The CDC 8600 Manual, a talk about Seymour Cray, an album of supercomputer photos, posters about the history of computing, etc. [GBell's Cybermuseum for Digital Equipment Corporation (DEC)](#) has artifacts, books, brochures, clippings, manuals, memos, memorabilia, photos, posters, presentations, etc. relating to DEC. We are working on a database for holding artifacts, making timelines, storytelling and giving tours as one might expect from a CyberMuseum. [A draft 0.1 historical events timeline](#) covering 1939-2000 organized into galleries of the big ideas, machines, software systems and apps, interfaces and input/output, memory and storage, and communications and networking.

Gordon was with his [DiamondCluster](#) colleagues at the Boulders, Carefree, AZ where the group was treated to test drives of the Segway, a dual-processor, two wheeled, computer and Human Transporter. [Dan Bricklin's](#) provides a detailed account of the Segway, but I ~~want~~ need one. Right is the Ford SUV version.

[Extended Bio](#) including Alaska fishing and France biking vacations…

[Papers, books, PowerPoint presentations, NetShow videos and Videotapes](#)

[Listing of Gordon's computers, projects, patents, books, videotaped lectures and papers](#)

Taken from Gordon Bell's website at: [www.research.microsoft.com/~gbell](#)