

MY FORTY YEARS OF HCI -- **A PERSONAL TIMELINE**

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Pre-History

1955: Receive my first desktop word processor when parents take out of storage an old black-framed Underwood typewriter to do my school papers for Junior High School 79, The Bronx.

1957: Discover K&E slide rules at Bronx High School of Science, New York City, for use in math and physics class. Think it really cool to have an 18" one swinging from its own holster on my belt: a nerd gunslinger.

1959: As I go off to Lafayette College, parents give me my first laptop: a grey Royal portable typewriter, manual, of course.

1963: Leave for Harvard social relations graduate school with new baby-blue Smith Corona portable. The first affordable electric typewriter, albeit with a manual carriage return.

1963: Introduced to a Monroe rotary calculator at Harvard graduate "sadistics" class with Fred Mosteller. It is more accurate and easier to use than a slide-rule. For large numbers, it has to be cranked over a number of places, but it automatically cranks back as it adds, multiplies, etc. – with a nice solid kerchung.

1964: Make one of the most important decisions in my life, by taking a computer course with Arthur Couch and David Armor. Except we start with pre-computer hardware. Learn to keypunch and use a counter-sorter: the thing with 12 pockets that movies used to love because it gave good visuals. Equipment hidden in the basement of Emerson Hall (where *Love Story* was filmed). Students told to worship the IBM machines because the legendary Sam Stouffer had used them two decades ago in his famous *American Soldier* study of troops in World War II. Discovered that "hard" quantitative data was mutable. I could put a 3-punch in the 9-pocket of the counter-sorter or wire the keypunch to punch a 9 when I hit the 3-key. Realized how hard Stouffer had worked. For example, to do a simple three-way analysis, such as seeing how male and female officers and non-officers had different attitudes, one would have to first run the deck of IBM cards through on the officer/non-officer column, remove the cards that have now been separately sorted into two separate pockets, and then run the cards from each pocket again, sorting on a different column to separate out female from male officers, and female from male non-officers. This sorts gender into two pockets, and by doing it twice, there are now four stacks

of cards. Finally, each stack is run through the counter-sorter separately using the attitude column to get the distribution of values for the attitude by gender and officer status. Meanwhile, the counter part of the machine has numbers on rotary dials that give a count of how many cards go into each pocket.

1964: Discover that the command “do not fold, bend, spindle or mutilate” printed on my utility bills was because IBM cards treated this way would jam in counter-sorters and accounting machines. Thenceforth, mutilate all my utility cards as a 1960s anti-bureaucratic protest and to create more jobs for workers who had to cope by hand with my de-automated card.

Mainframe

1964: After playing with counter-sorters, learn to program in Couch-Armor course: *FAP* [early Assembler] and *Fortran II* and *IV*. Submit many jobs (stacks of IBM punch cards) to the Harvard computer center, and sometimes get meaningful output back 10 hours later. *DataText* is the first liberating program for social scientists, for now they can do their own statistical analyses of large data sets without being a fancy programmer or spending months at counter-sorters. The data are stored on computer tapes that the control cards “call”. Despite lugging control cards to computer center, I only have to lug the much bigger set of data cards once, get them compiled onto tape, and then stored in the computer center’s library. As 50 boxes of cards equal about one megabyte and I could only carry five boxes at a time, we needed a shopping cart to transport the data cards. Printout comes on big green-and-white striped paper, 10.5”x15.0”, with holes on each side that latch onto the high-speed chain-drive printer. Everyone’s printout comes to the same place, so you get to see what everyone else is doing on the computer as you go through many piles to find yours, and hope it hasn’t been taken away by mistake. A big stack of paper means a successful job; a puny few pages means that your job failed and you must commune with the error messages to understand why. My fiancée Bev Meyrowitz goes back and forth with me to the computer and soon becomes Bev Wellman. (See *HCI – A Love Story*).

1964: Harvard’s Department of Social Relations moves to a new building in the Fall and gets remote mainframe access. Take second course on computer applications with Phillip Stone. Stacks of IBM cards are still submitted, but now within the warmth of the Social Relations building, rather than a walk across campus. In Social Relations, the cards of many people’s jobs are compiled onto computer tapes using a smaller IBM 1401 computer. Every few hours, someone remotely walks the tapes over to the Harvard 7094 mainframe. Turnaround time is still ten hours from submission of cards to receipt of printout.

1966: Spend months building a specialized dictionary for Stone’s *General Inquirer* textual analysis program. This analyzes teenagers’ self-conceptions. Main problems are understanding words in context and specialized slang. Stone does the actual *General Inquirer* run one night, on the 1401 computer itself, running *Autocoder*.

1966: Much of my dissertation data analysis done at this time on Harvard-developed *DataText* program.

1967: Just before I leave Harvard, Stone demonstrates to me remote teletype access between our building and Project Mac at MIT and ARPAnet. I am amazed, but didn’t fully appreciate that this was a precursor of the Internet revolution.

1967: Move to University of Toronto as an assistant professor, and work with Charles Tilly to buy the Sociology department's first rotary calculator, another Monroematic with whirring gears. Except this one does not go kerchung, because it does not have to be cranked over a few columns to start doing multiplications. However, its gears still whirr, and it has a wondrous button that does square roots. There is only one, so we queue at times for its use.

1968: Back to lugging my control cards to the Toronto computer center as I finish my dissertation about black and white kids' self-conceptions and start analyzing the first East York study. Compared to the hard scientists, we have relatively few control cards, but humungous amounts of printout. But we do have *DataText*, so my dissertation is completed.

1971: Buy my first electronic calculator to help analyze East York data: a Canon Canola 162 with two memories. Its 16-digit Nixie tube display looked like orange fluorescent lights. It does addition, subtraction, multiplication, and division in total silence, with the results display on a little screen. Does not have a square root key or fancy statistical functions.

1971: Stop using *DataText*; start using friendlier and speedier *SPSS*.

1971: Hire first research assistant. Key reason is to offload the frustration of getting *SPSS* control statements wrong.

1972: Discover that *SPSS* has its limits. Work with programmer Sigfrid Schulte to write a path analysis program in *APL*.

1973: Start using IBM Selectric typewriter – with correction button – to write papers.

1974: On sabbatical leave at Surrey University, England, discover that while all computer jobs are submitted locally, they are actually run at a University of London computer, 50 miles away. Turnaround time is 24 hours. Surrey's telephone interface also lags. To call outside of university, I must dial the university operator and give her a phone number. It often takes 30 minutes for the operator to come online and ask me what number I'd like to connect with. Often, the latter number is busy because other universities also have too few lines. I bring long books with me to work to read while waiting on the phone. Of course, there are no speaker phones, so I get a stiff neck while waiting for a connection to be made.

1976: Meet sociologist Roxanne Hiltz when she gives a paper at the American Sociological Association. She is working with computer scientist (and future husband) Murray Turoff to develop one of the first civilian email-like systems, combining messaging and computerized conferencing: *EIES* [Electronic Information Exchange Service]. As part of a National Science Foundation experiment, participants get a free 800 number to call that connects us directly to a central server. Because we all connect directly to the same central computer, there is more flexibility than current email. We can cancel regrettable messages at any time before recipients retrieve them, and we can send messages anonymously or using a pseudonym, which only the server knows. (I am "Alvey Singer"). Scholarly participants discover a secret which we bury in the hype: A small group of scholars don't have much to say to each other on a daily basis; the excitement of annual conferences is because we've stored up a year's worth of stories and findings. We use heavy (10-pound?) printing terminals (like teletype machines) with "modems" that have acoustic couplers on them into which a telephone handset is placed. They send and receive 11 characters per second, so people who send long messages are hated. I

develop the habit of starting the receipt of a message, and going for a coffee, toothbrush or shave while it prints.

1977: Wake-up on February 11 to hear on radio that fire has broken out at the computer center. Hundreds gather, weeping. Firefighters cover the computers with tarps mostly to protect them from water. However, while computers are replaceable, data are not. The computer centre's associate director, Rein Mikkor, saves the day (and the data) by using coat trees with their hooks removed. Several thousand tape reels are threaded onto these improvised carry racks and taken out of the flaming building. Only one tape was lost when someone stepped on it. Shortly thereafter, the university announces a much more rigorous data backup program.

1977: George Luste of the physics department had been talking for some years about the cost effectiveness of having the department's own computer and stop paying for high mainframe computer centre costs. Physics installs its own VAX-780 in December, the first one in Canada. Sociologists wonder who could afford to pay for the operating costs of such a luxury. By **2000**, almost all parts of the university who need them have their own server computers, with the main computer centre doing mostly computer networking and advising. Many and faculty just use their personal computers.

1978: Am the only scholar (out of twenty) who use computers for statistical analysis at the Netherlands Institute for Advanced Study in the Humanities and the Social Sciences, where I am on research leave. There is no direct computer connection, but once per day, a NIAS assistant takes my control cards 10 kilometers to Leiden University, submits my job and picks up my printout from the previous day's runs. I write the final version of "The Community Question" this way.

Remote Access to Mainframe

1979: New HCI interfaces arrive at the University of Toronto. I can submit computer runs from a typewriter-like terminal in the Sociology department. It used IBM golf balls just like in Selectric typewriters and printed at 11 characters per second: even then it seemed slow. It seems as if I have the entire mainframe at my disposal, but in reality, I am time-sharing with others across campus. I still must walk 700 meters to the computer center to pick up output. Or send someone: I hire research assistants who are good walkers. They become good weight lifters as we generate thousands of pages of printed output from the second East York study.

1979: Dot matrix thermal-printing terminals, using *ASCII*, become available, and I can submit computer runs from my office.

1980: Start using *SAS* statistical software instead of *SPSS* on the mainframe. This is because *SAS* has a function that allows me to summarize each person's social network, and then statistically analyze all of these summaries.

1980: Computer screens replace teletype printing terminals. It's all still done on the mainframe, using *ATS* [Administrative Terminal Service]. At first, editing is laboriously done by line number and ex post facto justification, using IBM's *TSO* [Time Sharing Option]. Doctoral students Marion Blute and June Corman pioneers write their dissertations this way.

1981: Full-screen editing using *Wylbur* replaces line-number editing. We use Lanpar video terminals at the Centre for Urban and Community Studies to connect to the mainframe. This makes it easier to edit mistakes, copy repetitious lines, and store and retrieve frequently used files and subroutines. The screens do text entry, but the entry could be either for writing (such as a dissertation) or for creating and editing command lines for statistical analysis. Whatever the input, the jobs are submitted to the IBM mainframe, where they run in queue, just as if they had been submitted through a card reader. My co-editor Steve Berkowitz tries to do our entire *Social Structures* book this way and runs into huge problems of flexibility and interoperability with Cambridge University Press.

1982: The Centre gets the use of its first high-speed printer, with the economists who share our building. There is no longer a need to trudge 500 meters to the computer center.

1984: The economists propose that they run their own stand-alone UNIX computer: a "Pixel-80" with a Motorola chip and an 80MB hard disk. They are forced by the Dean to get together with the sociologists. The plan is that it would be completely automated, with no need for expert technical attendance. The economics-sociology computer centre "EPAS" starts. The economists make two mistakes: 1. Sociologists use much more of the computer time than the economists had counted on. 2. Expert technical help is needed on a full-time basis. EPAS soon expands to an IBM 4361. Although the computer was "ours", it was physically located at the main computer centre because it was big, and needed a raised floor and cooling. EPAS (as "CHASS") later expanded throughout the Arts and Social Sciences, with multiple computers, data sets, email, websites, and a technical staff.

1985: Email becomes prevalent on a less-experimental basis: *Bitnet* in the U.S./Canada and later *Netnorth* in Canada. The two systems interconnect and link less easily with European equivalents. I schmooze with people near and far, and have never stopped. The great majority of those online are academics, although there is a parallel military system. At the same time, cumbersome non-graphical file transfer systems such as Gopher run separately, making it possible, but difficult, to transfer files.

1986: Buy Brother electronic typewriter with automatic underlining and write-ahead memory for easy error correction. The last typewriter I will ever buy.

1986: Visiting the Indian Statistical Institute (Calcutta) in August, am shocked when Suraj Bandyopadhyay tells me that researchers there are not able to do their own SPSS or SAS statistical analyses. For political reasons, they must use Russian-made computer and software. As this software is difficult to use, only trained technicians do the computer jobs. Turnaround time is one week, much slower than what I had in 1964.

Stand-Alone Personal Computing

1987: Buy my first stand-alone computer, the hot new 6 megahertz IBM AT with a 20-megabyte hard disk, one of the hottest machines of the time. It runs on the *DOS 3.3* operating system. (This timeline is being typed on a three-year-old Dell: a Pentium 4, with 1.5 Gigahertz CPU speed and 40 gigabytes of memory, using *Windows XP Professional*.) It is used principally for outlining (with *DOS MaxThink* which I still use), word processing (with *Word Perfect*, to which I am still loyal), email, maintaining the database of the professional society I head (with the wonderful but defunct *Cornerstone*), and as a remote dial-up terminal to *EPAS* to run SPSS statistical jobs. I also buy my first personal printer: an Okidata dot matrix, with passable output but needing special continuous-form paper with punched holes at each side. The AT is much too slow to run big statistical jobs on its own. Having a standalone computer creates a social revolution: No longer must I negotiate with secretaries to type and retype drafts of papers. This leads to more editing of drafts by me, but also greater productivity in the number of papers published.

1989: Start work with computer scientists (Ron Baecker, Bill Buxton, Marilyn Mantei and Gale Moore) to build the *Cavecat* and *Telepresence* desktop videoconferencing systems. Pre-Internet technology. It works, but is expensive to build and needs special high-speed lines. (This is well before commercial broadband.) It is not used very much, even within the project, because of slow connect times and privacy concerns.

1989: Start using *Endnote* to store my references in a specialized database. Entries can easily be formatted for the bibliographic style of each journal and book. Have accumulated more than 15,000 entries (journal chapters, books, etc.) by the end of 2003. They can also search by keyword and compile specialized bibliographies. Even though my assistants enter the references into Endnotes, the time saved in not having to retype entries is equaled by the time spent in raising money to pay assistants, supervising their work, proofreading their entries, and creating keywords. Retire six file boxes, filed with 3x5" bibliographic index cards.

1990: My centre buys a Hewlett-Packard III laser printer. Much faster, quieter and better output than my Okidata dot matrix printer. For shared use only when we need pretty printing, such as the final copy of a paper. Only glitch is that *Word Perfect* does not yet support proportional spacing as a WYSIWYG, so we must spend much time and care laying out our tables so the columns are aligned.

The Internet Matures

1990: Cajole the director of the centre to patch together an Ethernet line running through all offices. It connects to a router that links to the computer centre mainframe. It's done guerrilla style with an electric drill boring holes through office walls. No more need for slow dial-up telephone access that stops phone calls from being made. The network is still there in 2004, although the connection to the main computer centre has been substantially upgraded.

1991: Use *Nota Bene* to do textual searching of interviews from our second East York study. It is the first viable solution to textual analysis that I've found. For paper with Dave Tindall on the use of telephone networks in maintaining social networks, we can now quickly search 29 long interviews to find such things as mothers and daughters talking on the telephone about health problems. This sure beats scattering hundreds of 5x8" index cards on my living room floor, crawling around looking among them for common topics, and making small affinity stacks. Nevertheless, the 1964 *DataText* dream of linking statistical and textual analysis still hasn't arrived yet.

1992: Buy my first laser printer for personal use: a Hewlett-Packard 4M. No need to trudge down the hall to print final versions. Now have the ability to print pictures and graphs at my own desk.

1992: The modern Internet era begins, with the expansion of email to the rest of the world, especially through dot.com Internet addresses and commercial Internet Service Providers.

1993: Email's ease of communication is complemented by the new Mosaic web browser, whose graphical interface facilitates access to information.

1993: Convince the director of the urban centre to buy a high speed Hewlett-Packard 4 SiMX laser printer for statistical output. With 4 Megabytes of RAM, it does 16 pages per minute as compared to my ordinary HP4's 6 ppm. Its resolution is also higher: 600 dots per inch. Thirty years after I started doing computing, I do not have to go to the computer centre for output (although it is still on green-striped paper). All I have to do is to walk down the hall to retrieve our laser printed output.

1994: Buy my first computer for the house. Saves me the trouble of going to the office on nights and weekends to do statistical analyses, email or write. Slow, 2400 bps [bit per second] dial-up telephone modem ties up home phone, but is fast enough to send/read email via *DOS Elm*. As others do the same, I notice that fewer people work at departmental and centre offices.

1995: Multitasking with several types of software becomes less difficult, and even becomes easy when *Windows 95* debuts in 1995. I move almost completely from *DOS 6.2* to *Windows 95*, having skipped *Windows 3.1* as too clunky.

1995: Buy my first laptop (Dell) to take with me as a visiting professor at Hebrew University. I want to connect to the Internet from my apartment, except that there are too few dial-up ports. so dial-ups yield constant busy signals. To cope, I set my alarm for 2 AM to rise and sign-on to the Internet. Even at that time, email crawls, displaying about one line every 10 seconds. The crawling speed makes me aware of how complex is even a simple *Elm* emailer.

Powerful Personal Computing

1996: Personal computers now fast enough that it is feasible to run *SAS* and *SPSS* on them for large datasets, rather than on mainframes. Their graphical interfaces make it easier to compile commands. However, the flexibility of using programming codes is lost, and my collaborating students rarely develop the ability to create code. Spend much time and grant money ensuring that each student collaborator has a computer on his/her desks.

1996 Start Netville study with Keith Hampton of a highly wired suburb near Toronto, with 16Mb connection. Discover that even more than high-speed Internet connections, people value the ability to always keep their Internet connections on so that they can quickly share a thought.

1996: *AltaVista* becomes the first search engine I use to find things. Spotty coverage of the web gradually improves. For the first time in my life, I no longer have to (try to) remember everything. There is less need to know where to look, but still the need to know how to look and what to look for. Search engines provide topic sentences; humans provide depth and context.

1996: The Dean unilaterally changes the name of my Internet service provider from *EPAS* to *CHASS*. This locks university members out of a number of electronic discussion groups that only admit members (and their registered e-addresses). Dean herself never uses email and doesn't understand the consternation.

1997: Bev Wellman and I spend a week in Geneva teaching Swiss doctoral students how to use *UCINet* to do social network analysis. Several times that week, we wish out loud that Steve Borgatti, who wrote the program, was available to answer hard questions. In fact, Steve comes to Geneva at the end of the week to teach an advanced course. We plot a surprise moment for the Swiss students, adapted from Marshall McLuhan's appearance in Woody Allen's *Annie Hall*. At precisely 1100 on Friday, I saw out loud, "I wish Steve Borgatti were here." Steve then jumps into the room and exclaims, "Here I am Barry! How can I help?" A great way to end a course.

1997: Buy first printer for home use. Now there is even less reason to go to the office.

1997: Good friend and science fiction writer Judith Merrill dies. Become her email executor, patrolling her inbox for 2 months and dealing with those who email her.

1998: Deal with others' contributions to my edited *Networks in the Global Village* solely by means of exchanging file attachments. Start using attachments to exchange drafts of research papers with distant collaborators. FedEx bills plummet.

1998: Collaborate on National Geographic Society's *Survey 2000* with James Witte and others. Discover that the more people communicate on the Internet, the more they communicate face-to-face, countering the myth that the Internet is destroying community.

1998: As section chair, help found the discussion list and website of the Community and Urban Sociology section of the American Sociological Association. Almost all of our business is transacted through 1:1 and 1: many emails.

1998: Get trained in *Nud.ist*, a textual analysis language. This is a major step up from dumping all the interviews on the floor and crawling around to locate similar concepts.

1998: Early adopter of *Google* search engine. Miraculously fast, awesome coverage, and it uses social network analytic principles to identify important sites. Bookmarking now becomes a minor convenience rather than an absolute necessity for navigating the web. People stop asking for my “coordinates” because they can just *Google* them on the web. But as search hits come up in increasing long lists, a new skill becomes to select which appropriate website to click on.

1999: Use client-server software while a visiting professor at the School of Information Management and Systems, University of California-Berkeley. The upside is that when files come in via email, I can use Windows NT to drag them to my PC. Also, my research methods students can easily get shared access to a SPSS data file. The downside is that I must negotiate with SIMS computer technicians adding or modifying any software.

1999: <http://www.globeandmail.com/> allows me to keep up with Canadian news while at Berkeley. No longer a need to use a shortwave radio, hunt up a foreign newspaper store, go to the consulate, or the university library.

1999: Obtain high-speed broadband connection (DSL) for the house, making it easy to access websites rapidly. Connection speed suddenly rises from 26,000 bits per second to about 1 million. This allows speedy access to websites (which in a feedback loop are becoming more graphics-intensive and hence, slower to download over slow dial-up connections). Just as importantly, our phone line no longer tied up by computer use.

1999: While spending a month as a fellow at the Bellagio (Italy) center, I notice that the photocopier is locked up each Sunday. When I ask about it, I am told: “Sunday is its day of rest.”

The Internet Proliferates

2000: My pre-teen niece, Sabrina Cutaia, gets her AOL Instant Messaging account. I am the only adult she IMs with. She loves the instant feedback of IM, chatting with 5 people separately and simultaneously. She ignores her email account. By contrast, I hate IM as intrusive, chopping writing up into small bits, and compelling full attention.

2001: Set up my own website which has 35,000 hits by March 2004. Contains my vita, course outlines, publications, and pictures. People stop writing to me for my papers; they just go to the site and downloading. More people may be reading me via the web than via articles in journals.

2001: The capital-I Internet becomes the small-i internet as email and web pages are joined by instant messaging, internet telephone, web cams, personal digital assistants (Palm) etc. Everyone student I know is using *Napster* to share music (encoded in MP3 with some loss of fidelity). Even those this is illegal, because it is intangible bits rather than tangible atoms, it is seen as legitimate. Besides, it is hard to trace, and it is free. My student collaborators download alternative rock; my first download is “(I Can’t Get No) Satisfaction” by the Rolling Stones.

2001: Having many computers available for student assistants becomes less necessary as they start carrying laptop computers with them or work at home at their desktop PCs.

2002: Make my first guest appearance as a cartoonish avatar, lecturing at Katy Borner's Indiana University class. From Toronto, I control avatar Hotep (ancient Egyptian noble) through the mouse and keyboard, and answer student questions. More time and focus spent on controlling avatar than on intellectual content.

2002: Set up personalized "My Yahoo" account which provides me with a custom set of news headlines, weather forecasts, and sports scores. It replaces radio and TV news more than in-depth newspaper reading. TV news is stale by the time it goes on at 11 PM.

2002: Teach an undergraduate Internet and Society course in a "smart classroom" where each student has a PC on her desk, hardwired into the internet. I can project any student's work onto a large "smart whiteboard," and I can write on the whiteboard and save my scribbling as a computer file. Biggest challenge is to stop students from emailing, IMing, and web surfing during class so that they will pay attention to my lectures.

2002: Buy an ultraportable computer: Hewlett-Packard Omnibook 500. Now I can write and check my email while on the road. Use it for giving Powerpoint-illustrated lectures at other universities, and to allow both Bev and I to use computers simultaneously at home.

2002: Student assistants stop going often to the library. Most scholarly journals now have electronic versions available online (e-journals). If our (large) library buys a print subscription, it gets an e-journal subscription for free (or vice-versa). Some journals are online available online. The result is that I accumulate many articles to read because they are so easy to obtain online. Sometimes, I even get to read them.

2002: Find a *Palm* personal digital assistant on the street. Refuse to use it, because my breast pocket date book and pad are more convenient.

2003: Reluctantly shift most of my writing from *Word Perfect* to *Microsoft Word*, not because it is better, but because almost all of my collaborators are using *Word*, and imperialistic *Word* does not convert files very well from *Word Perfect*. Even when I send files to those who just want to read my work, the files often cannot be opened from *Word Perfect*.

2003: Tilburg University wants me to lecture at their 75th anniversary, but I cannot go. Instead, I use the Knowledge Media Design Institute's *ePresence* software to webcast from Toronto to Tilburg, including having complete control of my *Powerpoint* slides and being able to see the audience.

2003: Implement *Google-Alerts*, which searches for high-ranking *Google* mentions of a topic (such as my name or Bev's name). Also useful for a research project with narrowly defined keywords.

2003: Phone calls have essentially stopped coming to the office, except from my wife and the news media. Get over 100 email messages a day (half of them spam), and send about 50. I talk much more to people via email than I do in person. My network of communication is probably thirty times greater than it was in 1964 and probably ten times greater than before the proliferation of email in the early 1990s. I talk with more people, more often, at great (and near) distances, and with quicker exchanges of conversation. Online, of course.

2003: A friend sets up a VoIP (Internet) phone on an office computer to allow zero-cost phone calls. It crashes the system. Moreover, it is not much needed because I make few phone calls, current phone rates are cheap, email gives more control of when communication takes place, and email takes less time per interaction.

2003: The transformation of community to social networks has become so widespread that about ten software companies have set up popular social network software (such as *Friendster*) to help friends find friends of friends. I am connected to one, and Microsoft Research holds a conference on the subject in March 2004.

2004: At the same time, computer programs to study social networks have gotten much easier to use, and the field proliferates. At one time, I – who founded the scholarly society in 1977 – knew everyone and their research. Not a chance now.

2004: Use *shoutcast.com* to listen to my favorite radio genres online. Our Centre administrator listens all day to a Guatemalan radio station on the internet.

2004: In New York City, a 90-year old neighbor of Bev's mom proudly shows off her email setup.

2004: Have more than 2500 e-addresses in my address book, even though list is pruned occasionally.

2004: Setting up a wired home network (LAN). My wife and I will no longer have to jockey for using the single computer in the house that has internet and printer connections.

2004: Considering getting a wireless card for my ultraportable to allow me to sit in coffee shops and airports while net surfing. At home, it will let me work and watch TV simultaneously. If I see anything interesting on TV, I can look it up instantly.

2004: After forty years of computing, I suffer a herniated (slipped) cervical disk. I have sat at computers for too many hours, days, and years.

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