CS 4001 Possible Term Paper Topics

Your topic does not have to come from this list. These are suggestions. The brief comments and questions for each topic are just a few ideas to spark your imagination and get you started.

Identification and biometrics.
A company announced plans to sell an identification chip that is implanted under a person's skin. About the size of a grain of rice, it could contain personal information and emit a radio signal that identifies the person. Discuss beneficial uses, potential problems and abuses, and appropriate guidelines for use of such a chip and other identification technologies, including various biometrics.

Telemedicine.
Describe applications, from remote consultation to remote surgery. Benefits, possible problem areas (privacy, errors, loss of personalized care).

Health information on the Web.
Research and report on Web-based health information sites, including such issues as benefits, reliability of the information, privacy protections, techniques being developed to rate or accredit sites, impact on medical care. Patients of some healthcare providers can access their own records online. Describe an example. How does it affect medical care?

Computerized medical record systems.
Many large HMOs have implemented computerized patient record systems. Report on one or more such systems, focusing on benefits, privacy risks and protections, how well it is accepted by doctors and staff, and other relevant issues.

Privacy on the Web
What's happening now? Recent abuses and improvements. Describe and evaluate Web site policies and technical and policy privacy protections provided by the market, and current proposals for government regulations.

Personal data privacy regulations in other countries.
Report on personal data privacy regulations, Web site privacy policies, and law enforcement access to personal data in one or more countries, e.g. the European Union.

Computers in law enforcement.
Issues include benefits to crime fighting, invasion of privacy, problems caused for innocent people because of errors in databases. Describe cases where the computer system has been very helpful in catching a criminal, and describe cases where it has caused serious problems. An activity for this project could include a ridealong in a police car. (A few students did this in the past and found it very instructive.) Another possible activity is to interview someone who runs or supervises the use of local law enforcement computer systems. What databases do they access? How do they prevent unauthorized access? Have errors in NCIC been reduced?

Government surveillance of communications.
How are arguments about Echelon and Carnivore affected by the terrorist attacks in 2001? Technological responses to terrorism. Describe and evaluate some of the computer-based

technologies implemented or expanded after Sept. 11, 2001. Consider effectiveness, impact on daily life, air travel, etc., and arguments related to privacy and civil liberties.

Children on the Internet.
There are several problem areas: availability of material not appropriate for children, contact with people who seek to abuse children, and privacy risks from game sites that ask children for extensive personal and family information (for marketing purposes). How serious are these problems? What is being done about them? Evaluate various solutions. Do benefits for children on the Net outweigh risks? Can we arrange to have the benefits without the risks?

Electronic commerce.
Implications for the economy, for privacy, etc. Which industries will benefit? Which will be hurt? How will daily activities be affected? Are there significant social benefits or detriments from electronic commerce?
There are many more specific topics. For example, Smart Cards: uses, benefits, privacy implications and protections in a particular application or industry. Another example: Several companies are working on technology for micro-payments on the Net. What will the impact be (on the structure of businesses, physical store locations, communities, etc.) if we can easily make small purchases on the Net? What are the privacy and security issues?

Automated systems.
Study progress, safety, and social issues related to an automated system such as automated highways and self-driving vehicles.

Safety-critical applications.
Find a local application to study. Or study the Air Traffic Control system, which uses antiquated computers that break down often. Another idea: the Ariane 5 rocket which exploded because of a software problem. Investigate the safety measures used in software for other rockets. Nancy Leveson's book, Safeware is a good reference.

Use of computers in restaurants.
Investigation and discussion of the issues such as customer service, impact on employment, food safety, ambiance. Visit a restaurant with self-service ordering terminals. Some fast food restaurants use robotic devices for food preparation; report of one. Interview a waiter or restaurant manager. (This could be part of a paper that looks at the impact of computer automation in two or three industries or consumer services.)

Spam.
What is currently happening? Describe new technical solutions and the current state of regulation. Consider the relevance of freedom of speech. Discuss the roles of technical and legislative solutions.

Censorship of the Internet.
Some aspect not covered in the text, or study some issue in more detail. Some possibilities: filtering Internet terminals in libraries, control of the Net in other countries. (For historical background on libraries: Louise S. Robbins, Censorship and the American Library: The American Library Association's Response to Threats to Intellectual Freedom, 19391969, Greenwood Press, 1996.)

Information warfare.
Will the next wars be fought without bombs? Will computer networks and computer controlled infrastructure be the targets of military hackers? What is happening now? What kind of defenses are possible?

Copyright on the Net.
What's being done to protect intellectual property (music, movies, etc.) and encourage sales on the Net? Describe current controversies about digital rights management.

Free software.
What's happening with "free" software? What is the impact of Linux and Apache, for example? What are the implications for consumers? For big companies like Microsoft?

Hacking.
Report on the community of hackers who hack to improve security. Are their actions responsible and beneficial, or immature and harmful, or both?

Computer crime.
Perhaps focusing on credit card fraud and identity theft.

Hacktivism.
Report on specific incidents or organizations engaged in hacktivism. Compare to civil disobedience and to other kinds of hacking.

Government surveillance of the Internet.
The terrorist attacks on the U.S. in 2001 led to laws reducing restrictions on government surveillance of the Internet. Before that, the Clinton administration proposed massive monitoring of major computer networks by the government to protect their security. Is this a good idea? What are the pro and con arguments?

Are Web issues really new?
Choose two other technologies or innovations, such as radio, telegraph, railroads, or electricity, and find out what ethical, social, and legal issues and controversies arose about them. Compare the problems and issues to current problems and issues about the Web. What solutions developed? How well do those solutions fit the Web?

Computers and the environment.
How are computers used by nature researchers and organizations. Describe applications that help protect the environment. Describe aspects of computers that cause environmental problems. What do environmentalists think of computers?

Political activism on the Net.
How has the Internet helped or hurt political groups outside the mainstream? How is it used by major political parties and candidates? What is the impact? How do/should current regulations about political campaigns affect individuals and small organizations that set up Web pages to support/oppose candidates and issues?

Voting on the Internet.

In a few states, some people vote in the 2000 presidential primary elections on the Internet. Will most political elections be held on the Internet in the future? Discuss the problems of maintaining secrecy of each person's vote while preventing election fraud. What other issues are relevant? How are the states planning to handle these issues?

Violence in video/computer games.
What is the impact on children? There haven't been many serious studies yet. You could use studies on the impact of violence on television for background. Interview people who write and publish computer games to find out their policies and views about violent games.

Use of computers in schools.
How are they used? Are they really helping to teach or to babysit? Visit an elementary school or middle school and observe how computers are used. Interview a teacher and a few students. For background, find some of the many research articles on the effectiveness of computers in education.

Distance learning.
What are the common uses? What will be the impact on universities? On adult education? Is cheating a problem?

Monitoring of employees' Web use and email.
What policies are employers using? Perhaps study a few large businesses in your area. A useful part of a project on email privacy could be collecting and evaluating (or writing) sample policies for different kinds of employers (e.g., for your university, covering students, faculty, and staff, and for a software company in a highly competitive business).

Cyberspace communities.
What makes a "community"? How do cyberspace communities handle decision making, dealing with troublesome members, etc.? Find one community to study in depth, preferably one that you are a member of or have a special interest in. Possibilites: an online game community; the Open Directory Project, etc. (Please respect the community's privacy guidelines and ask permission if quoting members.)

Gender or ethnic issues.
The Journal of Women and Minorities in Science and Engineering might have some useful articles for background and ideas for specific projects. There have been several studies of differences in the way men and women use computers. There are many Web sites aimed at women or at specific ethnic minority audiences. You could study the differences and similarities between such sites and the Web in general.

Computing and network access in other countries.
For example, how are computers used in rural, poor areas of Africa? How do politics restrict access in Vietnam? Choose one country to study in depth or compare a few.

Science fiction and prediction.
Find several science fiction stories published at least 30 years ago that are set in the present time or near future and describe computer and communications technologies. Report on how closely their view of the technology corresponds to what is actually available. What social benefits and problems did they anticipate?

What will the world be like 50 years from now?
How will electronic communications and commerce affect the power of centralized governments?
Everyday life? What will happen as computers are connected to the human body? Deep Blue beat
Garry Kasparov at chess in 1997. Will human intelligence be of less value in the future? Several
experts have written books addressing these issues. You could read two or three and evaluate
their predictions.

Should the US have national ID cards?
Is the security of open source code better than closed source?
Is the Intellectual Property of the Online Arts and Crafts Communities sufficiently protected?
Should RFID tags replace bar codes and magnetic strips?

Digital Rights Management – forget about it?

How can privacy be protected in an era of search engines

Do biometric technologies violate personal privacy today, and how will they effect us in the
future?

Network neutrality – yes or no?

Freedom of Speech online vs in the real world – same or different issues and protections?

Computer Search and Seizures – analogous to other search and seizure? Are there special
issues?

Cybersquatting – good, bad or neutral?

Should US and State government switch to open source software?

Sports blogs and negative attention drawn to athletes – good or bad, and for whom?

Does the ability to have a software patent help or hinder the pace of innovation and
economic development?

Electronic voting – can it be made foolproof?

How to balance individual rights and freedom of speech on the internet.

Government censoring of internet content – good or bad?

Public library internet filtering – good or bad?

Social Networking Websites and Sex Offenders – on or off?

Surveillance and Privacy – how to protect, should we protect?

Copyright Infringement – borders need to be redefined?

Reliability of Wikipedia?

IT Outsourcing – good or bad?

Are H1B visas for computing professionals good or bad, and for whom?

Should shoot'em up games by banned?

Does extensive use of email and SMS by teenagers inhibit development of interpersonal skills?

Should email require paid postage, just like snail mail?

Does computing as a profession have a bad/negative image? If so, here is why, here's how to fix.

Does computing as a profession have too few women? If so, here's why, here's how to fix.

Does introduction of computers in elementary and high school improve education?

Is the Internet governance system broken? How should it be fixed?

Should researchers/scientists/developers keep pushing technology to the limits where it could threaten job security for store clerks, teachers, pilots, doctors, etc. and/or create a deskilled workforce?

China's own DNS poisoning of its internet services

Are video games art?

GPS and Privacy.

National responsibility in regard to digital infrastructure.

Impact and use of science fiction literature in framing technological debates.