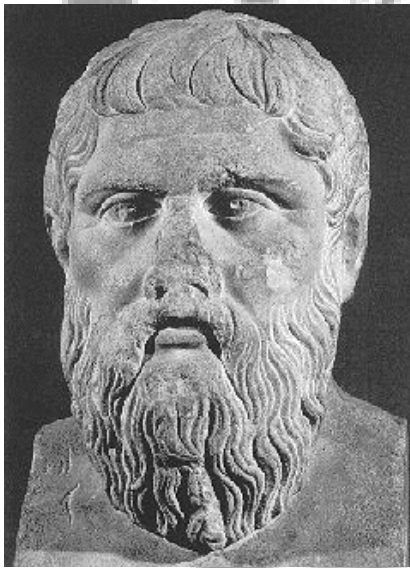


# Software Engineering and Ethics

**Sam Nitzberg**  
**November, 2002**



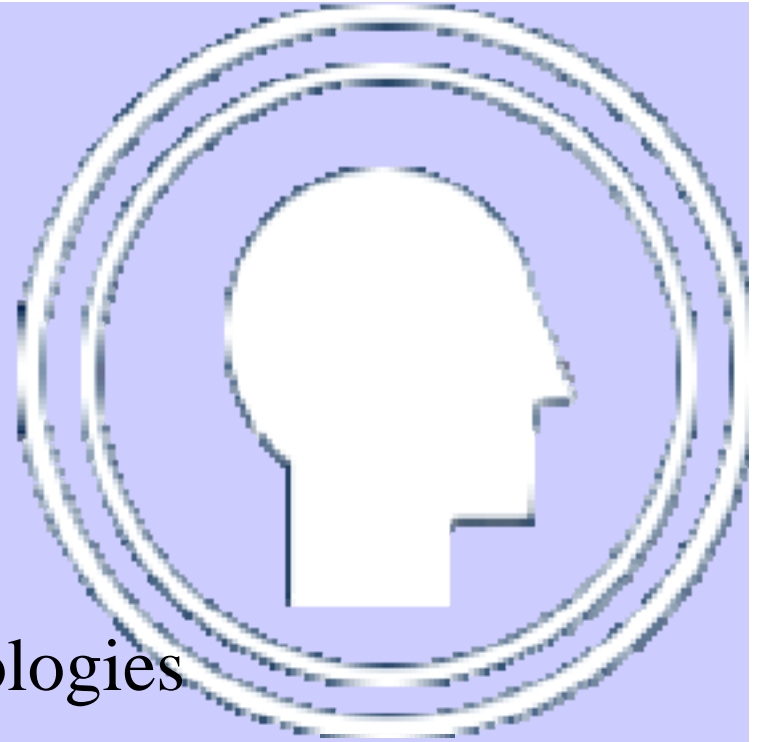
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# Themes

- Law
- Philosophy
- “Dual Use” Computing Technologies
- The Far Out Stuff



My goal is to provide a range of subjects for further consideration that are worth your time and attention, and that ultimately affect people directly.

# Law

- Intellectual Property
- Copyright / DMCA
- Cryptographic Export
- Code as free speech
- Open Source
- Accreditation  
(HIPAA, FDA,  
DITSCAP)



# Philosophy

Law, Philosophy, and  
Ethics do not always  
come together nicely.



# Movements

- Cryptoanarchy
- Hacktivism
- Data Havens
- Open Source



# The Hacker Ethic

- Hacker – No truly unified definition.
- One perspective – Himanen's book
- Another perspective – Videotapes from H2K conferences



# Don Gotterbarn

- Computer Ethics as a branch of professional ethics, concerned primarily with standards of practice and codes of conduct
- ACM Code of Ethics:

[http://www.cs.utexas.edu/users/ethics/professionalism/se\\_code\\_prof.html](http://www.cs.utexas.edu/users/ethics/professionalism/se_code_prof.html)



# Licensing Table

Profession	Duties include / May include	Licensing Required ?
Barbers / Hairdressers	Cutting and Styling of hair Applying of dyes to hair Use of proper hygiene	Generally required.
Manicurists	Cutting and Trimming of nails. Grooming of nails Maintaining proper sanitization of equipment  Licenses (in New Jersey, USA) are awarded following the successful passing of a one hundred question test, to be taken every two years to maintain licensing. Regulations are vital to minimize the risk of the spread of infection. [APP]	Generally required.
Civil Engineers	Design and construction of bridges, roadways, industrial buildings and complexes, military complexes and transit systems, dams, etc...	Mandatory
Prostitutes	"Personal Services"  Regular medical testing.  "Safe" practices.	Mandatory (Generally) where lawful, e.g. The Netherlands, United States (Nevada, outside the Las Vegas City Limits)







# “Dual Use” Computing Technologies

- GPS
- Databases
- Audio Processing Software
- Mathematical Applications
- The Internet
- More...





# Software Reliability



- Defects versus “Spoilage”
- Mathematical models for analyzing software failure rates; Musa Methods
- Formal Methods
- Difficulty of tracing all execution (or data) paths. NP-Complete problems. This lends towards fundamental issues in software testing.
- Numerical Analysis and its implications – cumulative error issues
- Good practices greatly benefit Good Software Development.

# Software Warranty



Cosmotronic Software Unlimited Inc. does not warrant the functions contained in the program will meet your requirements or that the operation of the program will be uninterrupted or error-free.

However, Cosmotronic Software Unlimited Inc. warrants the diskette(s) on which the program is furnished to be of black color and square shape under normal use for a period of ninety (90) days from the date of purchase

Note: In no event will Cosmotronic Software Unlimited Inc. or its distributors and their dealers be liable to you for any damages, including any lost profit, lost savings, lost patience or other incidental or consequential damage.

We don't claim Interactive EasyFlow is good for anything - if you think it is, great, but it's up to you to decide. If Interactive EasyFlow doesn't work: tough. If you lose a million because Interactive EasyFlow messes up, it's you that's out of the million, not us. If you don't like this disclaimer: tough. We reserve the right to do the absolute minimum provided by law, up to and including nothing.

This is basically the same disclaimer that comes with all software packages, but ours is in plain English and theirs is in legalese.

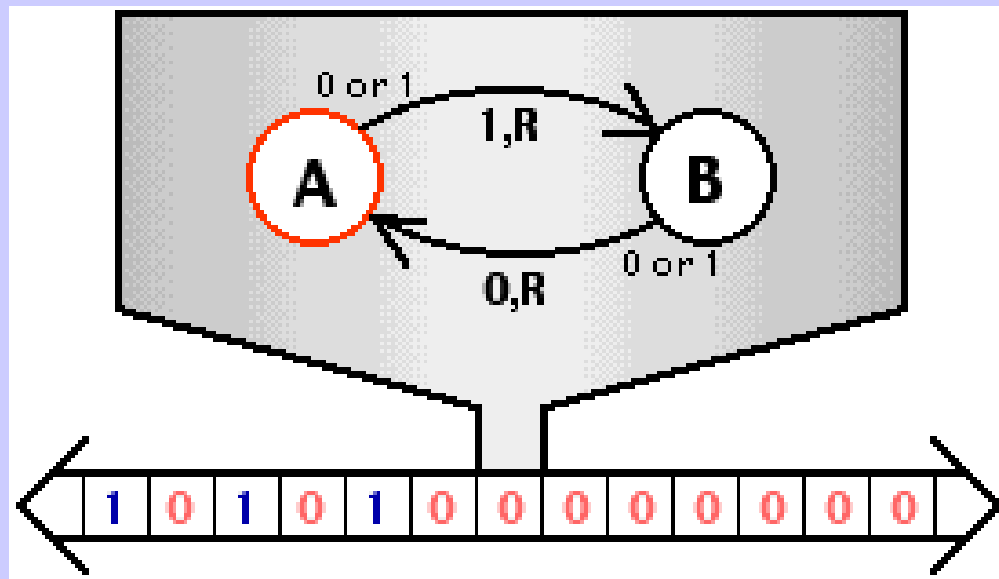
We didn't really want to include a disclaimer at all, but our lawyers insisted. We tried to ignore them, but they threatened us with the shark attack at which point we relented. [Page 45]

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Another extraordinary aspect of software marketing is the fact that the user generally pays for software updates. In other words, even if the product is faulty or needs amendment, the user pays the software supplier to provide more correct versions.[Forester]

# Software Complexity

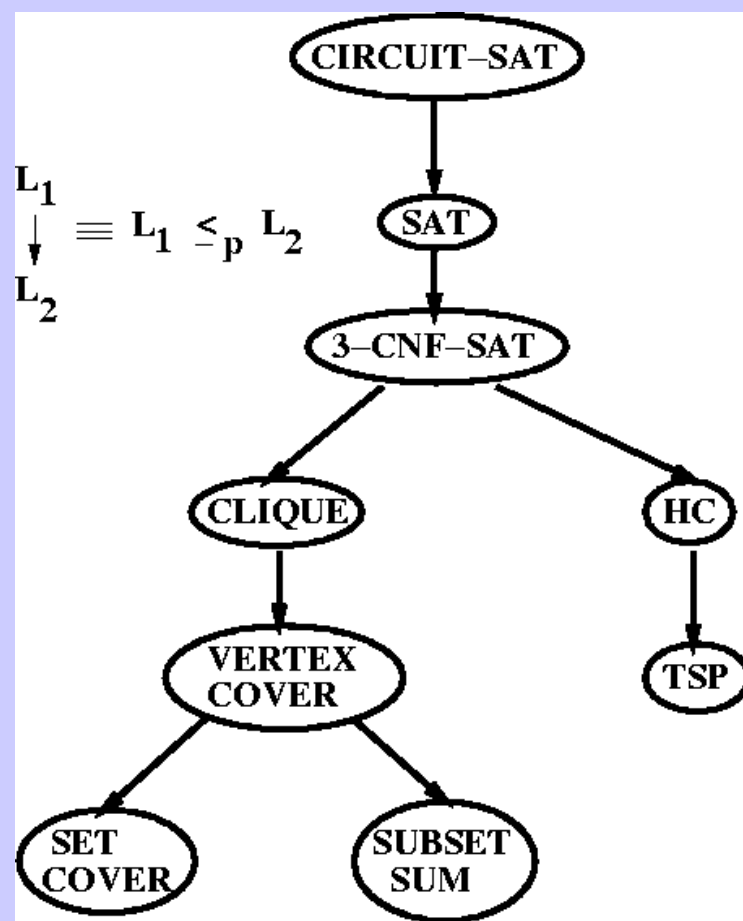
- Often cited as primary source of flaws in software (Scientific American, et. al)
- Usually, just a cop-out (Nitzberg). Most issues are a result of carelessness, poor process, or a result of weaknesses in CS / SE. Most systems are not of a fundamentally new nature



# What Can Software (not) do ?

## Complexity Theory, and theory of NP-Complete problems

- Nature of problems is often not covered in fundamental CS studies
- Nature of approximation Algorithms





# Is Microsoft Evil?



- Anticompetitiveness
- Anti-innovation
- Justice Department Issues
- EU Issues
- Lost Productivity (Robert Steele Argument)



# Is Microsoft Not Evil ?

- Innovation (MS's Claim)
- Good for the economy
- Even when MS is right...  
it's wrong ...





# Surveillance

- UK – Becoming more widely used in public places
- More methods of surveillance (time stamps, highway, metro), available
- More sophisticated means appearing in private hands
- Future may hold possibility of linking such systems – Digital Convergence

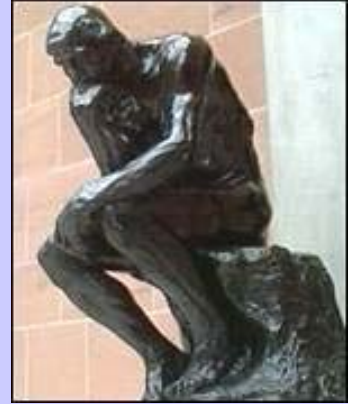


# The Far Out Stuff

- Computer / Bio-implant augmentation
- Mind Reading Machines
- Cyborgs and Ethics
- Large scale electronic monitoring
- Cyberwarfare / Cybergeddon



# Some Final Thoughts...



... “To every man is given the key to the gates of heaven. The same key opens the gate of hell...” we do not have any instruction as to which is which gate – Schweber, p. 19

Be aware of the quality of software and its consequences; the potential repercussions may not be obvious

# Recommended Reading

- My published papers on [www.iamsam.com](http://www.iamsam.com)
- The Digital Phoenix: How Computers are Changing Philosophy (Edited by Terrell Ward Bynum and James H. Moor) – Note that this is a sophisticated collection.
- Ethicomp conference web sites
- Centre for Computing and Social Responsibility  
<http://www.ccsr.cse.dmu.ac.uk>

*Note for faculty – Good Material for extra credit exam questions and essays here.*



# Recommended Reading

- The Trouble with Computers : Usefulness, Usability, and Productivity, Landauer
- The Hacker Ethic and the Spirit of the Information Age, Pekka Himanen
- Crypto: How the Code Rebels Beat the Government – Saving Privacy in the Digital Age, Steven Levy

*Note for faculty – Good Material for extra credit exam questions and essays here.*



# Recommended Reading

- The Transparent Society: Will Technology Force Us to Choose Between Privacy and Freedom?, David Brin
- In the Shadow of the Bomb: Oppenheimer, Bethe, and the moral responsibility of the scientist, S.S. Schweber

*Note for faculty – Good Material for extra credit exam questions and essays here.*



# Recommended Reading

- The Institute for Business, Technology, and Ethics (<http://www.ethix.org>)
- IBM and the Holocaust: The Strategic Alliance Between Nazi Germany and America's Most Powerful Corporation, Edwin Black
- 2600: The Hacker Quarterly, any issue

*Note for faculty – Good Material for extra credit exam questions and essays here.*



# Thank you . . .



*Sam Nitzberg's web site*  
*[www.iamsam.com](http://www.iamsam.com)*

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