

Research Ethics and CS

(based on

<http://www4.ncsu.edu/~drwrigh3/docs/pubs/sigdoc06a.pdf>)

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The foundation

- Social contract between scientific research and society:
 - The responsible conduct of research;
 - Clear and complete recording and reporting of research procedures, results, and analyses;
 - Respect for those that may be affected by that research.
- The CS bears a great responsibility to the world to conduct and report their research in an ethical manner.

1. Responsible research conduct

- Empirical science relies on measurements and observation to corroborate or disprove research hypotheses.
 - In CS, metrics and analysis methods are the primary instruments.
 - Unlike natural science, software systems are man made, and researchers must take care to avoid and/or account for biases.

1. Responsible (cont'd)

- Benchmarking computer systems' performance (SPEC)
 - Out of 115 papers published in highly respected computer architecture confs, only 23 used the entire suite.
- Bias in software research come from actual implementation of the software.
 - Performance varies among different OS and hardware.

1. Responsible (cont'd)

- The availability of standardized, well-defined means of making measurements is an essential element of science and research.
 - Provide a common ground to foster consensus, collaboration and rigor.
- Benchmarking:
 - a standard of excellence, achievement,
 - any standard or reference by which others can be measured
- A need to develop a standard for documenting and characterizing (1) metrics, (2) measurement techniques, and (3) benchmarking tools
 - to make informed decisions about the tools they use.

My thoughts

- Each measurement paper must be accompanied with
 - The dataset used for the paper
 - A detailed description of the manner of collecting the data.
- Network measurement tools and methodology are largely unbenchmarked.
- Much to be learned from the CA and SE benchmarking works.

2. Documenting and reporting research

- The ability to duplicate the work of other researchers is the most fundamental principle and responsibility of science.
- Rational discourse is a requisite for replicating research.
 - Clear and precise descriptions of experimental setups and protocols, ..., complete records of collected data, and so on.
 - Impossible to have a single standard for documentation and record keeping

2. Documenting (cont'd)

- Zobel recommended that CS researchers adopt the mandatory practices of other disciplines:
 - Daily research journal entries
 - Maintaining all versions of experimental software
 - Detailed log of collected data
- Tichy called the lack of experimental evaluation in CS “unacceptable, even alarming.”

3. Human participants in CS research

- Physical safety
- Open source software
- Recruitment of students or employees as research subjects
- Invasion of privacy

Links

- Institute of Physics:
http://www.iop.org/about/royal_charter/file_38393.pdf
- Ethical principles of psychologists and codes of conduct:
<http://www.apa.org/ethics/code/index.aspx?item=2>