

CSC 300 Spring 2008

Prof. Turner -- Lab Project #4: Digital Accuracy

Counts as 2 labs

Report due Wednesday 14, May

Last updated 7 May 2008

Overview:

The general public does not understand computers as well as computer professionals. The typical user believes a computer-based system should work as expected. What would the typical user think if he or she were told that systems they rely on are inaccurate? Are such systems in place in our world? In our city?

For this laboratory, you will have a large degree of freedom. You are to research a specific computer-based tool or systems that includes an accuracy calculation. You are to design an experiment to test the system accuracy. Finally, you are to determine where this system falls into the spectrum of societal rules and law.

Objectives:

1. Determine digital versus continuity of real world (digital accuracy versus accuracy required in real world).
2. Analyze how users are affected by inaccuracies in a software product.
3. Learn how software inaccuracies may result in legal, ethical and social consequences.
4. Prepare a well formatted and professional lab report and give a formal presentation with the results.

Resources:

Source of information about digital accuracy (see Procedure)

A system to test (each team must choose a different system and get it pre-approved)

Process for administering test

Software Engineering Code of Ethics

Some Famous Cases

[Windows Calculator](#)

[Pentium Bug](#)

[Patriot Missile](#)

[Parking Meters](#)

[James Kim death](#)

Process:

1. Review Code of Ethics

Which sections(s) in the Code of Ethics apply to this lab? Give a brief justification for each that you choose.

2. Locate an information source. There exists a wealth of Internet information on digital accuracy. For your own understanding and for use in creating your experiment, find one such reputable source (an article, paper, book, etc.) and be certain to have the entire team read it. Cite the source and discuss the main points made by the author about digital accuracy in our society.

3. Determine a system to test

In our everyday lives, there are many digital systems that we use and rely on. Find one such product or

system that your team can test. Each team must choose a different artifact and get their choice approved by Prof. Turner

4. Create a system diagram

Draw a context diagram (and possibly other UML diagrams) to describe the system and its basic architecture. Show the digital component and its interface to human users. How does the typical individual interact with the chosen system?

Recommendation: get your diagram(s) approved by Prof. Turner early.

5. Test the system

Determine what you must do in order to test the accuracy of your chosen system. This will be different for each system chosen but there are a few general guidelines.

Determine (specs, WAG, or ???) and document the accuracy requirement for your system.

Design tests that empirically observe the system and answer the question: Is this system accurate?

You must use a measurement device that is MORE accurate than the accuracy requirement.

Pay attention to any laws that might be applicable to your domain. Record all your data carefully and professionally. This is extremely important.

Deliverable:

Compile the data and information on the system, including its manufacturer, age, cost, specifications, regulations or laws surrounding it and anything else that will explain its domain. Your write-up should include:

- a. What are the basic societal guidelines that you observed (or should have observed) in the execution of this lab? This is an ethics course!
- b. Describe the system that you studied. Include the diagrams and specific information that applies. What is its accuracy requirement? How did you determine that requirement?
- c. How did you study this system? Write out the thinking behind and the guidelines that your team determined for testing the accuracy of the system.
- d. What data did you collect on the system in operation?
- e. Summarize your analysis of the system, based on the system accuracy?
- f. What kinds of problems could the system cause due to inaccuracy?
- g. Answers to all the questions above.

Final Note:

As logical thinkers, this lab is less well defined than you might like. But the creativity that you bring to the lab is as important as the execution. And act responsibly in the community, as you are a reflection on Dr. Turner and the Cal Poly.

Sources:

1) Parker, Donn B., Susan Swope, Dr. Bruce N. Baker. Ethical Conflicts in Information and Computer Science, Technology, and Business. Wellesley, Massachusetts. 1990.