Digital Accuracy

Purpose:

The general public does not understand computers to the level that we do. To them, a computer, or digital system, should work as expected and be quick about it. However, we have a more educated, if not completely unbiased, view of this technology. What would the average user think if he or she was told that digital systems that they take for granted in fact do not work as they believed? Are such systems in place in our world? In our city?

For this experiment, you will have a large degree of freedom. You will research a specific tool or mechanism that uses digital technology to be responsible for some level of accuracy. Then, you will design an experiment to test how accurate that system truly is. Finally, you will determine where this system falls into the spectrum of rules and law, and see what it is that we are trusting everyday.

Resources:

- source of information about digital accuracy (see Procedure)
- a system to test
- means for administering test
- as always, the Software Engineering Code of Ethics

Procedure:

1. Locate an information source

  There exists a wealth of information and ideas about this concept on the internet. The discussion of digital accuracy is a broad one. For your own understanding and for use in creating your testing experiment, find one such source (an article, paper, book, etc.) and be certain to have the entire group read it. Give us the source information, as well as the main points made by the author about digital accuracy in our society.

2. <u>Determine a system to test</u>

In our everyday lives, there are dozens of items that we use with reliance on their accuracy, all without knowing for certain how truly accurate they are. Find one such system that your group has access to. Possible choices:
- traffic lights
- parking meters
- UPC scanners

3. <u>Create a diagram for system</u>

Create a context diagram and simple UML (or other) diagram to describe the system and its most basic architecture and show the digital component and its interface to human users. How does the average individual interact with your chosen system?

4. <u>Test your system</u>

Determine what you must do in order to test the accuracy of your chosen system. This will be different for every device chosen, so there are few specific guidelines that can be set. However, your tests must empirically observe what this device does and answer the question, "Is this device accurate?" For a parking meter, time it to see if it gives you the time that you bought with your quarter. For a traffic light, video an intersection, and then time each change. Also pay close attention to any laws that might be applicable to your domain.

Write-up:

Compile the information that you gathered on the system that you've chosen, including its manufacturer, age, cost, regulations or laws surrounding it, or anything else that will explain its domain. Your write-up should include:

a. What are the basic rules that you observed (or should have observed) in the execution of this lab? (Some of you might be wondering why we are harping on this idea, but this is an ethics course, after all)

b. Explain the system that you studied. Include the diagrams, and specific information that would apply.

c. How did you study this system? Write out the thinking behind and the actual guidelines that your group determined for testing the accuracy of the digital device.

d. What were your observations of the system in operation?

e. What were you findings, based on the system's accuracy?

Final Note:

This lab might appear to be vaguer than you might like, as logical Computer Scientists. However, the creativity that you bring to the lab is as important as the execution. As always, if you have questions about the lab or our expectations, please ask. This lab experiments are still … experimental, and we require your input to improve. Again, act responsibly in the community, as you are a reflection on Dr. Turner and the University.