Program Satisfaction Based on the Perception of Bugs as Features

Luke Badini
Matthew Anderson, Advisor

ABSTRACT:
How much does telling the user that a bug is a feature affect how satisfied they are with using the program? I modified the responsiveness of the UI of ArgoUML and conducted an experiment in which I asked users to make UML class diagrams. The result of this experiment was that you should not tell users about bugs in your program.

BACKGROUND:
- Herzig et al. have explored using machine learning to see how misclassifying bugs as features affects bug prediction [1].
  - They concluded that machine learning would predict bugs as features too often and that bug checking should be done by a human.
- Gajos et al. have explored how three different types of toolbars in Microsoft Word affected user satisfaction [2].
  - They concluded that the Split UI performed the best, but was not significantly better than the Moving UI.

EXPERIMENT DESIGN:
- Modified three aspects of the UI:
  - When hovering over something, it will take 2000ms for the tooltip to pop up.
  - When clicking to make a class object, it will take 1000ms for the rectangle to appear.
  - When clicking to make a class object, the rectangle will be offset by a random amount between -10 and 10 units in the x- and y-directions.
- Three groups of participants:
  - Control: gave them unmodified ArgoUML.
  - “Bug”: gave them modified ArgoUML and told them I optimized the UI.
  - “Feature”: gave them the modified ArgoUML and told them I edited it.

DATA ANALYSIS:
I ran two-sample chi-squared tests on the results of the survey and found that there were statistically significant results in four areas:
1. Tooltip responsiveness for the control group versus the feature group
2. Tooltip responsiveness for the feature group versus the bug group
3. Click accuracy for the control group versus the feature group
4. Frustration for the control group versus the feature group
I also ran two-sample t-tests on the time data but there was no statistically significant data for these tests.

CONCLUSIONS:
- My modifications likely had no effect on how long it takes to draw a UML diagram.
- My data suggests that it might not be a good idea to tell users about bugs in your programs.
  - The feature group reported significantly lower scores on the survey than the control group.