

Good Examples for Exposing Bad Practice

A “Killer Examples” Workshop

Dale Skrien
Colby College
djskrien@colby.edu

Michael E. Caspersen
University of Aarhus
mec@daimi.au.dk

Jürgen Börstler
Umeå Universitet
jubo@cs.umu.se

Adrienne Decker
University at Buffalo
adrienne@cse.buffalo.edu

Carl Alphonc
University at Buffalo
alphonc@cse.buffalo.edu

Abstract

The “Killer Examples” series of workshops are highly interactive workshops which have been an annual occurrence at OOPSLA since 2002. The goals of the workshop are to bring together educators and developers to share their object-oriented expertise, and to provide a forum for discussion of teaching techniques and pedagogical goals. The theme of last year’s workshop was pedagogically sound examples for object orientation; this year’s workshop continues that theme, but rather than focusing on examples that demonstrate sound object-oriented design, it will focus on examples that expose bad practice and so lead to better appreciation of good practice, as obtained by following sound object-oriented principles.

The workshop will present such examples which are or can be used in the teaching of object-orientation. All participants in the workshop will critique the examples and actively engage in refining the examples in a way that they support a clear and sound pedagogy.

While there was a formal application procedure to guarantee admission to the workshop, we do accept walk-ins if space permits and the walk-ins are determined to have adequate interest and background in the workshop theme to be able to contribute positively to the discussions.

Categories and Subject Descriptors K.3.2 [*Computers and Education*]: Computer and Information Science Education—Computer Science Education

General Terms Design

Keywords Object-orientation, Pedagogy, Process, Teaching, Learning, Programming

Themes and Goals

Since 2002 we have organized and run, with various colleagues from different institutions, the “Killer Examples” series of workshops at OOPSLA. These workshops have been well-received, and have adapted over the years in response to attendee feedback to keep interest high.

Early “Killer Examples” workshops focused on gathering examples of design pattern usage which are suitable for use in a CS curriculum, especially in beginning courses. In these workshops the focus was, to a large extent, on what we teach.

One piece of feedback that we have received regarding the killer examples that have come out of previous workshops is that while the examples themselves are good to have, the example themselves do not come with a roadmap for bringing them into the classroom. To begin to address this, in 2007 the focus was placed more on how we teach object orientation.

In this year’s workshop we continue with this focus. In particular, we wish to focus the workshop’s attention on the use of examples that expose bad practice.

Students, when presented with good (killer) solutions to problems, can appreciate how the solutions incorporate sound OO principles, but they may not understand what is wrong with alternative solutions that also appear good to them. It is important that students learn how to look at a bad solution to a problem and critique it with regard to standard OO principles, such as Law of Demeter or the Liskov Substitution Principle. Skill at critiquing bad code is valuable in code reviews and in other situations involving reviews of existing or proposed solutions to problems.

Good examples that demonstrate bad practice can be as simple as a section of code with a poorly named variable that misleads the reader regarding the behavior of the code.

Alternatively, a good example might be one that looks to be well-designed at first glance, but demonstrates fragility when changes are attempted. Another example might consist of an inappropriate application of a design pattern. Also, a large method that can easily be refactored using the Extract Method refactoring could be another example.

Some examples could demonstrate several bad practices, and so require a series of design changes or transformations in order to be converted into a good solution.

In our workshop, participants will discuss examples exposing bad practice that they have seen or used in their teaching, whether it be in a traditional classroom or in an industry training setting. Such examples are often found in students' solutions to problems or in existing code bases in industrial applications.

During the workshop the organizers will present the workshop participants with problems and solutions to those problems that utilize bad practice. The participants will then play the role of students and will work in groups to discuss what is wrong with the solutions and how they can be made better. After the group work, the participants will come together to compare their results. Finally the participants will discuss ways to improve the initial problems and solutions to better expose bad practices.

In the past we have disseminated results from the workshops in several ways. We have presented posters reporting the results of past workshops at both OOPSLA and SIGCSE.

Workshop activities and format

This is a full-day workshop, held from 8:30 AM to 5:00 PM on Sunday, October 25, in Pastoral 3 (please check conference schedule for last-minute changes). The workshop is highly participatory, with different levels of contribution possible.

The organizers will first set the stage for the day's activities by reiterating the goals and format of the workshop. For each accepted presenter we will have a presentation/discussion session. During each of these sessions the participant who submitted examples will present their examples, along with solutions to those problems that utilize bad practice. The other participants will then work in groups to discuss what is wrong with the solutions and how they can be made better. After the group work, the participants will come together to compare their results. Finally the participants will discuss ways to improve the initial solutions to better expose bad practices.

In our workshop, participants are encouraged to discuss examples that they have used in their teaching, whether it be in a traditional classroom or in an industry training setting. During the course of the pre-workshop and workshop activities, the workshop community has worked together to ensure that there is a clear description of the problem, the context in relation to a topic or course, relevant supplemental materials (e.g. diagrams, code snippets), and that there is a defined progression of how to present the example and eventual solution. This process might involve discussion of pure classroom examples (those that are demonstrated fully in the classroom), or pure assignments (those that are given solely for the students to complete), or ideally, an example that is started and explained in the classroom and then given to the students to finish as an assignment.

Post-workshop activities

After the workshop participants will be expected to submit final versions of their examples for inclusion on a web site for general dissemination via the workshop website:

www.cse.buffalo.edu/faculty/alphonse/OOPSLA2009/

We have in the past presented posters of the workshop at the conference poster session, and will do so again. The workshop poster is halfway prepared ahead of time, with general information about the workshop and its presentations, but with open space for workshop outcomes, to be filled in after the workshop. Workshop participants are encouraged to help present the poster.

Participation

The workshop has a formal application procedure to guarantee admission, but we will accept walk-ins if space permits and if the walk-ins are determined to have adequate interest and background in the workshop theme to be able to contribute positively to the discussions.