

Playful Programming: Introductory Computer Science Using the Luwak Ludic Toolkit

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ABSTRACT

This workshop introduces the **Luwak Ludic Toolkit (Luwak)**, a game-building extension of the ACM Java Task Force's `acm.jar` package. **Luwak**, taking the term *ludic* seriously, supports CS1 students in writing their own computer games on day one. It also addresses the "learning to program the toolkit" problem by being extremely lightweight; students learn enough to look under the hood in a single semester. This workshop provides an introduction to **Luwak** through a variety of assignments drawn from across a typical CS1 semester. These assignments, as well as the complete **Luwak** toolkit, will be available during the workshop on CD-R (or before at `luwak.simplecomputergames.com`). The primary goal of the workshop is to give participants enough information and material that they can start teaching with **Luwak** as soon as they wish.

INTENDED AUDIENCE

This workshop's intended audience includes late secondary and early post-secondary computer science educators who are interested in using game development in the CS1 classroom as well as those interested in leveraging the ACM Java Task Force's packages in introductory programming courses.

PRESENTER BIOGRAPHY

Dr. Brian C. Ladd worked as a consultant on the first *America's Army* video game. He went on to work at Epic Games as a programmer on *Unreal Championship II: The Liandry Conflict* for the Xbox Game System.

Dr. Ladd has used computer games to motivate programming students for more than a decade. While bringing a new CS major on-line, he developed a competitive but non-violent microworld, *Robogames*; for more than six years introductory programming students learned to program robots for Winter Olympic events such as hockey and figure skating, participating in cross-sectional competitions. He designed and taught an introductory course based on text adventure games. Since moving to SUNY Potsdam, he has had the opportunity to teach an upper-level *Computer Games and Simulation* course.

Dr. Ladd's teaching with video games led to a contract for a book, *Simple Computer Games in Java (SCG)* [Wiley, 10/2008]. The **Luwak Ludic Toolkit** and many of the assignments were developed in support of the book.

MATERIALS PROVIDED

Each participant will receive paper and electronic copies of (a) workshop lecture slides including presenter's notes, (b) a selection of programming assignments taken from across a typical CS1 course using **Luwak**, (c) the **Luwak** API documentation (student view). In addition, each participant will receive a CD with the current version of **Luwak** software with all sample programs and tutorials; to ease installation the CD will also include a copy of the current Java Task Force software.

AUDIO/VISUAL AND COMPUTER REQUIREMENTS

Presenter will require a digital projector (1024x768 resolution, minimum). Participants should have laptop power and Internet connections at each seat. The Internet connection is not strictly necessary (software will be available for installation before the workshop and from CD and the presenter's thumb drive at the workshop). Linux, Windows, and Mac laptops running Java 6 will be supported.

Laptop Required: This is a hands-on workshop. The introduction **Luwak** will be through doing typical first day assignments, reading student-facing documentation, and then working some more involved examples. To get the most out of this workshop, each participant will require a laptop running Java 6 to run sample programs and complete in-workshop

assignments.

SPACE AND ENROLLMENT RESTRICTIONS

There are no special space or enrollment restrictions. A cap of 30 students should suffice.

OVERVIEW

Workshop assignments are drawn from various chapters of *SCG* to introduce the toolkit, give participants a chance to see how it supports traditional CS1 outcomes, and to see how the simplicity of **Luwak** permits instructors to peel back layers of the toolkit and have introductory students provide their own implementations. Participants will see how students can go from programming a toolkit on day one to programming Java in the course of a semester.

Workshop participants will have a chance to influence the material covered: the course can focus on the existing CS1 assignments, solutions, and rubrics or, if attendees desire, on the design and construction of new, different assignments along with sample code and grading criteria to support them.

Luwak is an open-source (GPL3) toolkit extending the ACM's Java Task Force's `acm.jar` software. **Luwak** mirrors the JTF's design, adding automatic animation and event-driven collision detection. A selection of useful collision reactors permits students to make simple games as soon as they can compile a Java program. The simplicity of the toolkit makes replacing the provided reactors possible as students learn more about Java, methods, and classes. More information, code, and sample programs are available at `luwak.simplecomputergames.com`. Information on the forthcoming *Simple Computer Games* book is also available on that site.