Applying Gameful Design Heuristics

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Abstract

To evaluate gameful apps and games, we have recently developed a new set of guidelines for heuristic evaluation of gameful design in interactive systems, supporting the quickly growing gamification research area. Our set of 28 gamification heuristics allows rapid evaluation of a gameful system. This course will supply attendees with our gameful design heuristics and train them in using the heuristics on an example application (Duolingo). The course is structured into two 80-minute units, which will give the participants enough time to learn the new heuristics and apply them to the gamified application. Finally, at the end of the second unit, we will be discussing how to generate design ideas with the heuristics. The course instructors, Gustavo Tondello and Lennart Nacke, have both developed the gameful design heuristics and have experience in designing and evaluating gamified applications and teaching courses.

Author Keywords

Gamification; Heuristics; Gameful Design.

ACM Classification Keywords

H.5.2. Evaluation/Methodology.

Benefits

Gamification, using game design elements in non-game contexts [2], is a fast-growing research area that uses user experience (UX) design and evaluation methods to build interaction technology that increases user motiva-

Schedule	
Unit 1	
0-20	Lecture: Introduction to Gameful Heuristics (Tondello)
21-40	Familiarizing with the Duolingo app and Discussion
41-50	Heuristics Briefing and Handout
51-80	Supervised heuristics evaluation session with Duolingo
Unit 2	
0-5	Recap
6-30	Continue the supervised heuristics evaluation session
31-50	Lecture: Turning heuristics into design actions (Tondello)
51-80	Discussion of possible design action outcomes of heuristics session

Table 1: The schedule for two 80-minute course sessions at CHI with a break in between.

tion and engagement across areas of health, business, and education [4,7] with an increasing focus on personalized experiences [3,9]. For this course, we refer to gamification and gameful design interchangeably, because to us both frame the same set of phenomena from different points of view [1,2,4]. One learning outcome of this course is to train people in gameful design using our *gameful design heuristics* [8]. This is done through hands-on exploration of our novel method of gameful heuristics to evaluate gameful applications. Through our training, participants will gain rapid evaluation skills and learn how to improve gameful applications with a new set of heuristics, which are free for them to keep. In a nutshell, participants will learn a novel evaluation method, get access to this tool for their own future use, and gain UX evaluation skills.

Intended Audience

This course introduces a novel set of heuristics used to evaluated gameful applications and gameful design, so an interest in either games and playful interaction is helpful for participants interested in the course. Given that these heuristics are aimed at people working with real-world designs, we anticipate the audience for this course to go beyond graduate students in HCI and also appeal to designers, user experience professionals, as well as industrial and academic researchers. The course is particularly useful for people interested in game design and user experience evaluation.

Prerequisites

The are no prerequisites for this course, but it would help if participants are familiar with the concepts of heuristics (and possibly gamification) in general. We will make the heuristics available to the participants via a website and as handouts during the course at CHI.

Content

The course is structured into two units (see Table 1), with a heuristic evaluation session (a supervised hands-on exercise) taking up the majority of the course time. The goals of the course and its heuristics evaluation session are:

- Understand the 28 gameful design heuristics [8] and apply them correctly to a game or gameful application and understand the differences.

- Use the gameful design heuristics and the Hexad model [9] to turn design flaws and improvement suggestions into design actions that can be addressed in the next iteration of a design cycle.

Our lectures provide additional insight into what our gameful design heuristics are and how we believe they can help designers and UX professional improve their gameful products.

Lecture: Introduction to Gameful Heuristics
Heuristics are principles or broad (usability) guidelines that have been used to design and evaluate interactive systems, but our set of heuristics is aimed at enabling interaction designers to identify gaps in a gameful system's design. We will introduce the 12 heuristics dimensions: Purpose and Meaning, Challenge and Competence, Completeness and Mastery, Autonomy and Creativity, Relatedness, Immersion, Ownership and Rewards, Unpredictability, Scarcity, Loss avoidance, Feedback, Change and Disruption. We will discuss the three categories that they are split into: intrinsic motivation, extrinsic motivation, and context-dependent heuristics and what their origins in the gamification and psychology literature are [1,5,6].

Lecture: Turning Heuristics into Design Actions
While the complete set of our heuristics represents the best scenario that a gameful applications can be developed in, we must consider design scenarios where some heuristics might not apply or are more difficult to transition into design imperatives. A system might be able to accomplish its goals without implementing all the heuristics, in the same way that a game does not need to include all existing game mechanics to be enjoyable. We are planning to present some edge cases and some clear mapping of heuristics into gameful designs.

Practical Work
The course features one long-form heuristics exercise (with the example application Duolingo[1]), where participants are trained in applying all 28 heuristics to the application. As a result of this exercise, participants will learn how to use the heuristics to list the design gaps in a gameful application regarding the different motivational affordances implemented into the application's design.

In addition, we are planning a hands-on design action session, where we turn the heuristics results into clear design actions that can be reported back to developers, thus closing the iterative loop between evaluation with heuristics and informed design. This section will build upon our previous work on relating specific gameful design elements to diverse user preferences [9], which complement the gameful design heuristics with an actionable design-oriented framework.

Background of Instructors
Gustavo F. Tondello, M.Sc., is a Ph.D. student at the HCI Games Group, University of Waterloo, Canada with a main interest in gamification and games for health and learning. He has been investigating several topics related to design, evaluation, and personalization of serious games and gamified applications, particularly regarding the application of player or user typologies in games and gamification. He has evaluated games professionally and has been teaching Computer Science courses at the University of Waterloo as part of his graduate studies.

Lennart E. Nacke, Ph.D., is an Associate Professor for Human-Computer Interaction and Game Design at the University of Waterloo. He has many years of experience serving on SIGCHI program and steering committees and teaching University graduate classes on HCI research methods. Dr. Nacke has co-organized many workshops for CHI over the past five years; he also chaired the CHI PLAY 2014 and Gamification 2013 conferences, served as technical program co-chair for CHI PLAY 2015, and served as the CHI Games and Play subcommittee co-chair for CHI 2017, and is currently the chair of the CHI PLAY steering committee.

Resources
Our heuristics will be made available at www.hcigames.com and we will also provide them during the course as physical handouts that participants can take home with them.

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[1] www.duolingo.com

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