

## CS1 Repository Entry Embedded EthiCS @ Harvard Teaching Lab

### Overview

<b>Course:</b>	CS178 Engineering Usable Interactive Systems	
<b>Course Level:</b>	Advanced undergraduate	
<b>Course Description:</b>	In this course, students learn critical techniques, concepts, and technologies for building usable interactive systems, alone and in pairs. Assignments provide hands-on experiences with different modern frameworks, platforms, and libraries while conceptual commonalities and distinctions are annotated and explained. Lectures cover relevant basic and advanced topics, such as human cognitive capabilities, iterative prototyping, and human-AI interaction. The final project will require both front-end and back-end development, iterative prototyping with humans, and a final evaluation with target users.	
<b>Module Topic:</b>	Gamification, value analysis, and value capture	
<b>Module Author:</b>	Aksel Braanen Sterri	
<b>Semesters Taught:</b>	Spring 2023	
<b>Tags:</b>	gamification [CS], perverse incentives [both], value capture [phil], games [both], values [phil]	
<b>Module Overview:</b>	The module is on gamification and the benefits and drawbacks of gamification. The students were also given a framework with which to systematically examine gamification on apps like Twitter, Strava, and Duolingo. The framework has three parts: 1. Identify the rules of the game of the app (what things are possible and impossible, and what are the success criteria?) 2. Identify the values the app seeks to promote. 3 Identify matches and mismatches between the rules of the game and the promotion of values. In the module, the framework is applied to Twitter. What values is Twitter seeking to promote? How does the rule of the game either promote or prevent these values? Finally, the module distinguishes between the problem of value capture and the problem of perverse incentives.	The analysis of gamification and value capture draws heavily on C. Thi Nguyen's work on games (OUP 2020).
<b>Connection to Course Material:</b>	The course teaches "critical techniques, concepts, and technologies for building usable interactive systems." Gamification is one part of that toolbox. It also serves as a way to think about design choices and the values either promoted or prevented by such choices. The course does not discuss gamification, but the students have been exposed to it in previous courses.	Gamification is a potent tool for designers, but it also has serious downsides. Games, values, and value captures are also independently interesting philosophical concepts. Another topic that could be explored in this course is disability since many design choices are particularly pressing for people with different disabilities. This could be connected, as has been done in previous years, with a discussion of the social model of disability or distributive justice. These questions could also be discussed through the lens of discrimination

and how designers should think about avoiding adverse consequences for some groups. The module instructor also considered talking about chatbots like Replika that serve as therapists, friends, and even romantic partners.

Goals		
<b>Module Goals:</b>	<ol style="list-style-type: none"> <li>1. Explore what gamification is.</li> <li>2. Examine what makes games and gamification powerful.</li> <li>3. Explore the benefits and drawbacks of gamification.</li> <li>4. Present a framework for analyzing gamification through reverse-engineering existing technologies to see where the technology can be improved.</li> <li>5. Analyze apps like Twitter and Strava.</li> </ol>	
<b>Key Philosophical Questions:</b>	<ol style="list-style-type: none"> <li>1. What goals are really valuable, and which values are merely apparently so?</li> <li>2. Why are games appealing?</li> <li>3. What is value capture?</li> <li>4. What is the problem with value capture?</li> <li>5. How can technology be designed for good?</li> </ol>	<p>It is a concern that gamification is used by designers without thinking about why games are so attractive and how gamification may influence beyond the intended effects. It is therefore useful for computer science students to be exposed to philosophical questions such as what goals are really valuable, and that there is a risk that gamification leads to value capture, where complex and deeper values are replaced by superficial and simpler values.</p>

Materials		
<b>Key Philosophical Concepts:</b>	<ul style="list-style-type: none"> <li>● Gamification</li> <li>● Games</li> <li>● Noise</li> <li>● Value pluralism</li> <li>● Value capture</li> <li>● Deep and shallow values</li> </ul>	<p>Why do we find games and gamification attractive? According to Nguyen, games are attractive because they create temporary harmony. We are given values to care about and a match between abilities and ends. On the other hand, life is a struggle and is plagued by value conflict. If we do X, we cannot do Y. We have no clear sense of what is right. Games simplify and put us in a flow state. Applied to the real world, this can create problems, such as when communication becomes gamified</p>

**Assigned Readings:**

on Twitter. We might start striving for other values (likes, retweets) than we originally wanted, such as learning and teaching. The module instructor did not assign any readings. One possibility is to get the students to listen to one or two podcasts with Nguyen, such as one [with Ezra Klein](#) and [Sean Carroll](#).

### Implementation

- Class Agenda:**
1. Present a list of apps that use gamification
  2. Point out the benefits of gamification, such as that it helps people reach their goals without (too much) struggle.
  3. Why is gamification so powerful? Ask students about their opinions.
  4. Present C Thi Nguyen's theory of games and Mihály Csikszentmihalyi's concept of flow.
  5. Present possible problems with gamification, like addiction, manipulation, and exploitation, and put them aside.
  6. Examine Twitter and list alleged problems with Twitter.
  7. Present a framework for analyzing the possible problems of gamification and other design choices through reverse engineering and explicit value analysis.
  8. Ask the students to reverse-engineer Twitter with a focus on values.
  9. Stress that we are shaped by design choices and distinguish between two ways we can be shaped: Perverse incentives and value capture (where the latter is more problematic since it changes our values, not just our behavior).
  10. Explain value capture.
  11. Ask the students to apply what they have learned to a seemingly "unproblematic" app like Strava (an exercise app).

**Sample Class** The module involves three active learning sessions.

- Activity:**
1. Ask the students to explain why games and gamification are so powerful before introducing Nguyen's theory of games. The module instructor relates the students' ideas to his theory.
  2. Reverse engineer Twitter collectively: Ask the students to examine the values of Twitter, the rules of the game, and how particular design choices promote or prevent these values.
  3. Ask the students to apply the framework to a seemingly unproblematic app like Strava.

It is important not to spend too much time on the analysis of Twitter to make time for the student activity at the end.

**Module Assignment:** Are there any problems related to gamification in Strata? Focus on “segments” and “leaderboards.” Apply relevant parts of the framework from class (see below). Optional: What steps can Strava take to achieve the app's values better?

Write a maximum of four paragraphs.

Framework:

An app creates a world for the user; what sort of world?

1. What are the Rules of the Game?
  - a) Functionalities
  - b) Success criteria
2. What values is the world designed to promote?
3. Match between Values and the Rules of the Game.
  - a) Do the “rules of the game” promote its values?
  - b) Is the world’s values worth striving for?
  - c) Does the world prevent other values of importance?
  - d) Does it change us for better or worse? (is there a risk of value capture?)

**Lessons Learned:** The module was overall successful and got great feedback from students. However:

1. Many students found it difficult to understand how specific design choices impact values. More time should be spent on specific design choices, such as Twitter’s “like button.”
2. Some students found the overall discussion of gamification too basic. Again, a way around this would be to make the analysis more specific.
3. Some students also found it hard to grasp the concept of value capture. The module instructor compared it to perverse incentives to help them grasp it. One option is to choose between focusing on the framework or making the lesson more about value capture. In the latter case, spend more time clarifying the concept.

The assignment asks the student to apply a framework to analyze Strava. This is the same framework they are exposed to in class and applied when analyzing Twitter. This gives the students a chance to revisit what they learned in class. It also gives the instructor a chance to see whether the module is successful.

An alternative to an analysis of Twitter’s like button would be to compare two different apps with different “Rules of the Game” to drive home the relevance of design choices.