Automated Bugs Identification Through Early Access Game Review Analytics (EAGRA)

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MS Thesis Proposal

# Introduction

## Introduction and Background

The game industry has become one of the most profitable markets in the entertainment industry. Knowing what customers and users think and how they feel about a game is a central piece to drive the decision-making process, of any game developer or game studio, towards the user satisfaction. The steadily increasing popularity of computer games has led to the rise of a multi-billion-dollar industry.

Due to the scale of the computer game industry, developing a successful game is challenging. In addition, prior studies show that gamers are extremely hard to please, making the quality of games an important issue. Most online game stores allow users to review a game that they bought. Such reviews can make or break a game, as other potential buyers often base their purchasing decisions on the reviews of a game.

Studying gamer reviews help developers better understand the concerns and further improve the user-perceived quality. Bugs that persist into releases of video games can have negative impacts on both developers and users, but particular aspects of testing in game development can lead to difficulties in effectively catching these missed bugs. It has become common practice for developers to apply updates to games in order to fix missed bugs.

In order to cope up with these problems we are generating a bug report from user reviews on steam platform which help the developers and team to understand which are the areas which need to be fixed.

## Motivation

Other people’s opinions are the most important piece of information for most of us. The popularity of computer games has led to the rise of a multi-billion-dollar industry. Due to the scale of the computer game industry, developing a successful game is challenging. Commercial applications and information systems are much different form one another. Games reviews on platform like Play Store, Steam are immense knowledge source. Studying game reviews can help game developers better understand user concerns, and further improve the user-perceived quality of games. There must be an automated mechanism which analyses the game reviews then generate bug report from it. E.g. identification and classification of bugs.

It’s the most emerging area of software engineering only few studies and reputed journals are available. In recent years’ game distribution platform are house-hold phenomenon.

# Literature Review

Some bugs reappear even after an update attempts to fix them. An approach is developed a taxonomy for bug types in games that is based on prior work. They examine 12,122 bug fixes from 723 updates for 30 popular games on the Steam platform. Then label the bug fixes included in these updates to identify the frequency of these different bug types, the rate at which bug types recur over multiple updates, and which bug types are treated as more severe. They find that challenges in testing, code quality, and bug reproduction have a close association with bug persistence. These findings help developers identify which aspects of game development could benefit from greater attention in order to prevent bugs. [1]

Video games are complex, emergent systems that are difficult to design and test. This difficulty invariably leads to failures being present in the game, negatively impacting the play experience of some. A taxonomy of possible failures, divided into temporal and non-temporal failures is presented. The taxonomy can guide the thinking of designers and testers alike, helping them expose bugs in the game. This will lead to games being better tested and designed, with fewer failures when released.[2] Most online game stores allow users to review a game that they bought. Such reviews can make or break a game as other potential buyers often base their purchasing decisions on the reviews of a game. Empirical study of the reviews of 6224 games on the Steam platform, one of the most popular digital game delivery platforms, to better understand if game reviews share similar characteristics with mobile app reviews, and thereby understand whether the conclusions and tools from mobile app review studies can be leveraged by game developers.[3]. Unity Linter, a static analysis tool that supports Unity video game developers to detect seven types of bad smells they have identified as relevant in video game development. Results of our empirical investigation indicate that developers well received performance- and behavior-related issues, while some maintainability issues are more controversial. Unity Linter is, I general, accurate enough in detecting smells (86%-100% precision and 50%-100% recall), and our study shows that the studied smell types occur in 39%-97% of the analyzed projects. [4]

# Problem Statement

Games reviews are immense source of knowledge. Traditionally analyzing or manually analyzing of bugs on large number of reviews is a tedious and nearly impossible task.

Quite recently some studies have explored which mainly focus on some automated review analysis mechanism however most of the existing work in app review analytics is confined to other fields. There is very confined work on game review analysis and among them very studies have focused on comprehensive summary of bugs Larger and diverse set of bug categories are not mainly focused state of the art algorithm are not used.

There is need of broader coverage of classification or automated analysis approach that provide comprehensive summary of gaming bugs and provide automated solution for identification of bugs.

# References

[1] A. Truelove, E. Santana de Almeida, and I. Ahmed, “We’ll Fix It in Post: What Do Bug Fixes in Video Game Update Notes Tell Us?,” pp. 736–747, 2021, doi: 10.1109/icse43902.2021.00073.

[2] C. Lewis, J. Whitehead, and N. Wardrip-Fruin, “What went wrong: A taxonomy of video game bugs,” *FDG 2010 - Proc. 5th Int. Conf. Found. Digit. Games*, pp. 108–115, 2010, doi: 10.1145/1822348.1822363.

[3] D. Lin, C. P. Bezemer, Y. Zou, and A. E. Hassan, *An empirical study of game reviews on the Steam platform*, vol. 24, no. 1. Empirical Software Engineering, 2019.

[4] A. Borrelli, V. Nardone, G. A. Di Lucca, G. Canfora, and M. Di Penta, “Detecting Video Game-Specific Bad Smells in Unity Projects,” *Proc. - 2020 IEEE/ACM 17th Int. Conf. Min. Softw. Repos. MSR 2020*, pp. 198–208, 2020, doi: 10.1145/3379597.3387454.