A Multivocal review on derivation games

Authors: Diego Castro, Claudia Werner
(diegocbcastro@cos.ufrj.br, werner@cos.ufrj.br)
Federal University of Rio de Janeiro

Presenter: Diego Cardoso
November 13 - 17, 2023 - Valencia, Spain
Diego Cardoso Borda Castro

Federal University of Rio de Janeiro
- PhD in progress in Software Engineering
- Master in Systems and Computer Engineering

Rio de Janeiro State University
- Degree in Computer Science

Claudia Maria Lima Werner

Federal University of Rio de Janeiro
- PhD in Systems and Computer Engineering
- Bachelor's degree in Mathematics (Informatics modality)
- Currently, is a full professor at the Federal University of Rio de Janeiro (UFRJ) in the Systems and Computer Engineering Program (PESC) at the Alberto Luiz Coimbra Institute for Postgraduate Studies and Engineering Research (COPPE).
Introduction

- Games have emerged as a prominent form of entertainment [1, 2]
  - One of the most profitable
- Process of developing a game [2, 3]
  - Extremely complex
  - Multitude of activities, components, and team members
  - Long time to be produced
Introduction

- Game community [2]
  - High number of players
  - Opportunistic reuse
    - Many advantages
  - Modding [2]
    - Lack a structured framework
- Reuse X Mod
  - Multivocal review [5, 6]
Multivocal review

- Research protocol [5, 6]
  - Scopus, ScienceDirect, IEEEXplore
  - PICOC
  - Snowballing process
- Research execution procedure
  - Inclusion criteria
  - Exclusion criteria
  - Quality Criteria
Multivocal review

● What modifiers are used to create games from other games?
● What characteristics are needed to derive a game?
● What are the advantages and difficulties of creating games from others?
● What tools strategy or frameworks support these changes?
What modifiers are used to create games from other games?

- Modding is the process and technique of modifying or adapting video game - "Do It Yourself" [2, 4]
  - Interface customization
  - Conversions Partial
    - Mutators/tweaks
    - Add-ons
    - Mods
  - Total Conversions
  - Machinima
  - Patch
What characteristics are needed to derive a game?

<table>
<thead>
<tr>
<th>Avatar</th>
<th>Game world</th>
<th>Game play</th>
<th>General features</th>
</tr>
</thead>
<tbody>
<tr>
<td>Operation rules</td>
<td>Levels</td>
<td>Strategic dilemmas</td>
<td>Rules</td>
</tr>
<tr>
<td>Transition rules/states</td>
<td>Rules of objects</td>
<td>Winning and losing conditions</td>
<td>Score</td>
</tr>
<tr>
<td>Actions</td>
<td>Behavioral rules</td>
<td>Chains of actions</td>
<td>Behaviors</td>
</tr>
<tr>
<td>Temporal states</td>
<td></td>
<td></td>
<td>Goal</td>
</tr>
<tr>
<td>Obstacles</td>
<td></td>
<td></td>
<td>Rewards</td>
</tr>
<tr>
<td>Mission</td>
<td></td>
<td></td>
<td>Game loop</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Interface</td>
</tr>
</tbody>
</table>
What are the advantages and difficulties of creating games from others?

- **Advantages**
  - Shortest time
  - Fewer processes
  - Adaptation
  - Components
  - Don't reinvent the wheel

- **Difficulties**
  - Understand the code
  - Lack of tools
What tools strategy or frameworks support these changes?

- Cloning and do-it-yourself [2, 4]
  - Most popular methods of mod development
  - Ad hoc reuse

- Software development kits (SDKs)
  - Creation Kit, GECK, Construction Set, MODKit…

- Open Source

- UI modification tool
Conclusion

- Game companies are growing in size
  - Billions of dollars per year
- Time-consuming process
- Review
- Software Reuse
  - Ad hoc reuse
  - Process and tools
References

A Multivocal review on derivation games

THANK YOU!

Diego Castro, Claudia Werner
(diegocbcastro@cos.ufrj.br, werner@cos.ufrj.br)
November 13 - 17, 2023 - Valencia, Spain