Linnéuniversitetet
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Technical Description
1DV437 Introduction to Game Programming
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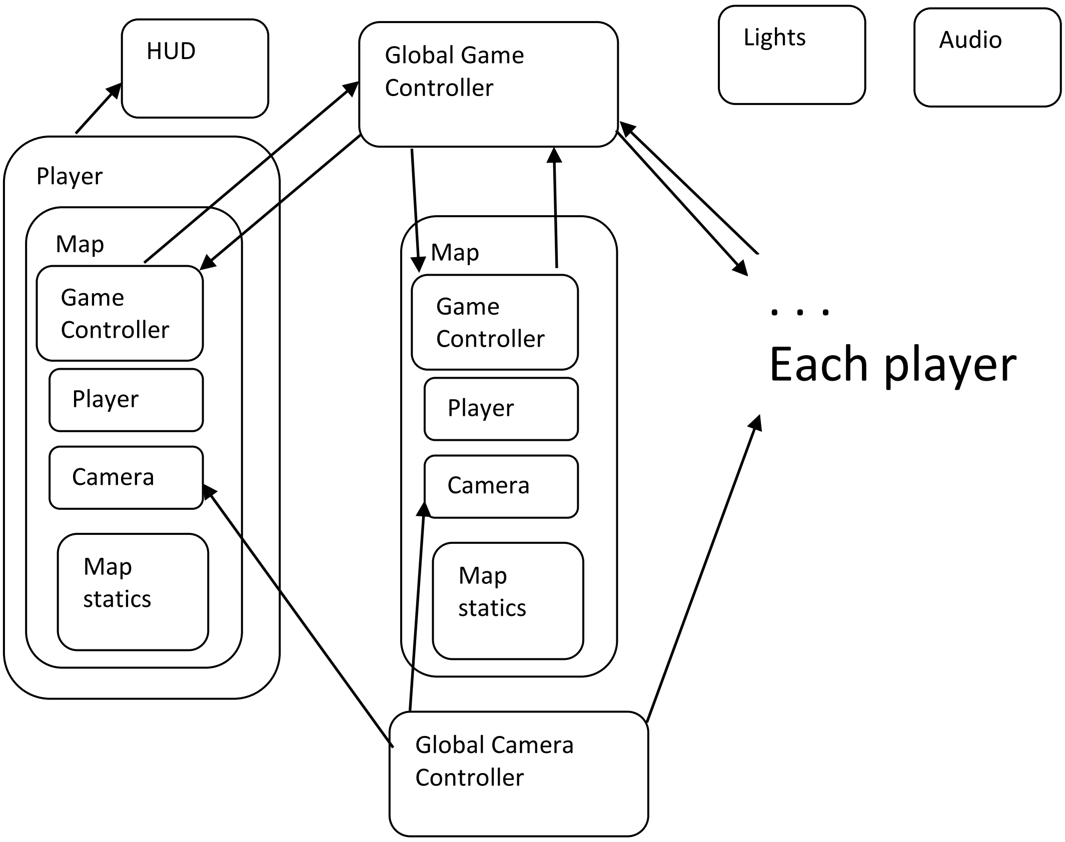
VS - introduction

This document is a technical descripton of the game VS for the course 1DV437 at Linnéuniversitetet. VS is a singelplayer game where the player controls an AI-thirdperson character. Several characters can be chosen and each character has various abilities which can be used to incapacitate randomly spawned enemies. Killed enemies will award experience which eventually will level up the character and unlock stronger abilities. VS game idea is inspired by the famous Warcraft 3 modification ”Rabbits vs Sheep”.

Architecture

A figure of game overview.

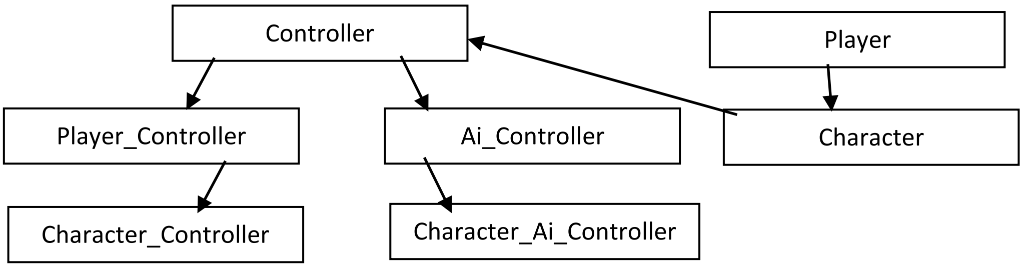


The figure above show how the game is structured. The Global Game Controller creates a map for each Player in game. Map has a reference to all modules inside. The Game Controller generate new enemies and updates current player score. The Player is either an ai or player. The Camera is controlled by the Global Camera Controller. The HUD is controlled by the player-map.

VS does not strictly follow a general architecture, but can be descibed as a modular architecture with controlling dependencies. The reason I chose this architecture is because this way I could develop the game in early-modules, so that i faster could reach a testable game. This architecture does feel familiar and easy to understand. This architecture does also give an advantage when I in the future implement an internet-multiplayer functionallity.

Design patterns and data structures

The polymorphism in controller and player figure.



Polymorphism is implemented in controller to devide the controller between player and ai. The player and ai can then be devided into character specific controllers. This facilitates the implementation of new characters in the game. Polymorphism is also used in enemy for future use of random enemies on map.

A Lazy initalization is also implemented to start functions in correct order on game start.

Singleton is used in the Statics class, where static values are shared.

The following Enums exist in VS:

- **Buttons**: This enum describe hudbuttons and abilities. Such as first ability and potion.
- **Player** character. Describe a players character.
- **Difficulty**: Descibes difficulty of the game. Easy, normal and hard.
- **Player controll**: Describe if player is controlled by Player or Ai.
- **Powerups**: Describe all available powerups.

Collision and geometry

VS uses the fysics engine with simplified collision meshes to make sure non-static gameobject can't walk through each other. Collisions are checked between allies, players, static map and enemies. Only box colliders and sphere colliders are used to improve preformance.

Movement is handled by changing transform postion over time.

Saving and loading data

Playerprefs is used to save and load data in the game. To easily keep track of saveable data, the playerprefs-keys can be retrieved from the Statics class.

Textures, shaders, materials and lighting

I didn´t have much time create own textures, shaders, materials and lighting. Mostly the game have standard shaders and lighting. Materials and textures used comes mainly from Unity Asset Store.

Animations

Player and enemy animations are from assets store. They are controlled by animation controllers. These are called in the code with triggers and bools.

Implemented keys

The following keys are implemented in VS:
Left-, Right- arrow: Change character in character selection scene.
W: Move forward.
A: Move left.
S: Move backward.
D: Move right.
SPACE: Use potion.
1: Use first ability.
2: Use second ability.
3: Use third ability.
4: Use fourth ability.
C: Change Camera
X: Change Camera focus to player.
V: Hide/show small health and energy bar.

Assets

The following assets from Unity Asset Store are used in VS:

- Baker House 1.2
https://www.assetstore.unity3d.com/en/#!/content/26443
- Level 1 Monster Pack 2
https://www.assetstore.unity3d.com/en/#!/content/77703
- Low Poly Traffic Cone 1.0
https://www.assetstore.unity3d.com/en/#!/content/69355
- Magic Pack 1.1
https://www.assetstore.unity3d.com/en/#!/content/36269
- Medieval Gold 2.0
https://www.assetstore.unity3d.com/en/#!/content/14162
- Mushroom House 1.0
https://www.assetstore.unity3d.com/en/#!/content/61027
- PowerUp particles 1.1.2
https://www.assetstore.unity3d.com/en/#!/content/16458
- RPG Character Mecanim Animation Pack FREE 1.5
https://www.assetstore.unity3d.com/en/#!/content/65284
- Skybox Volume 2 (Nebula) 1.0
https://www.assetstore.unity3d.com/en/#!/content/3392
- TextMeshPro 1.0.55.0b11
https://www.assetstore.unity3d.com/en/#!/content/84126
- TangyTextures Material Pack 1.0
https://www.assetstore.unity3d.com/en/#!/content/19225
- Unity Particle Pack 1.2
https://www.assetstore.unity3d.com/en/#!/content/73777
- Warrior Pack Bundle 2 FREE 1.0
https://www.assetstore.unity3d.com/en/#!/content/42454
- Warrior Pack Bundle 3 FREE 1.0
https://www.assetstore.unity3d.com/en/#!/content/47320
- Yughues Free Ground Materials 1.0
https://www.assetstore.unity3d.com/en/#!/content/13001