

# Game Development

Ricard Pillosu - UPC



# Contents

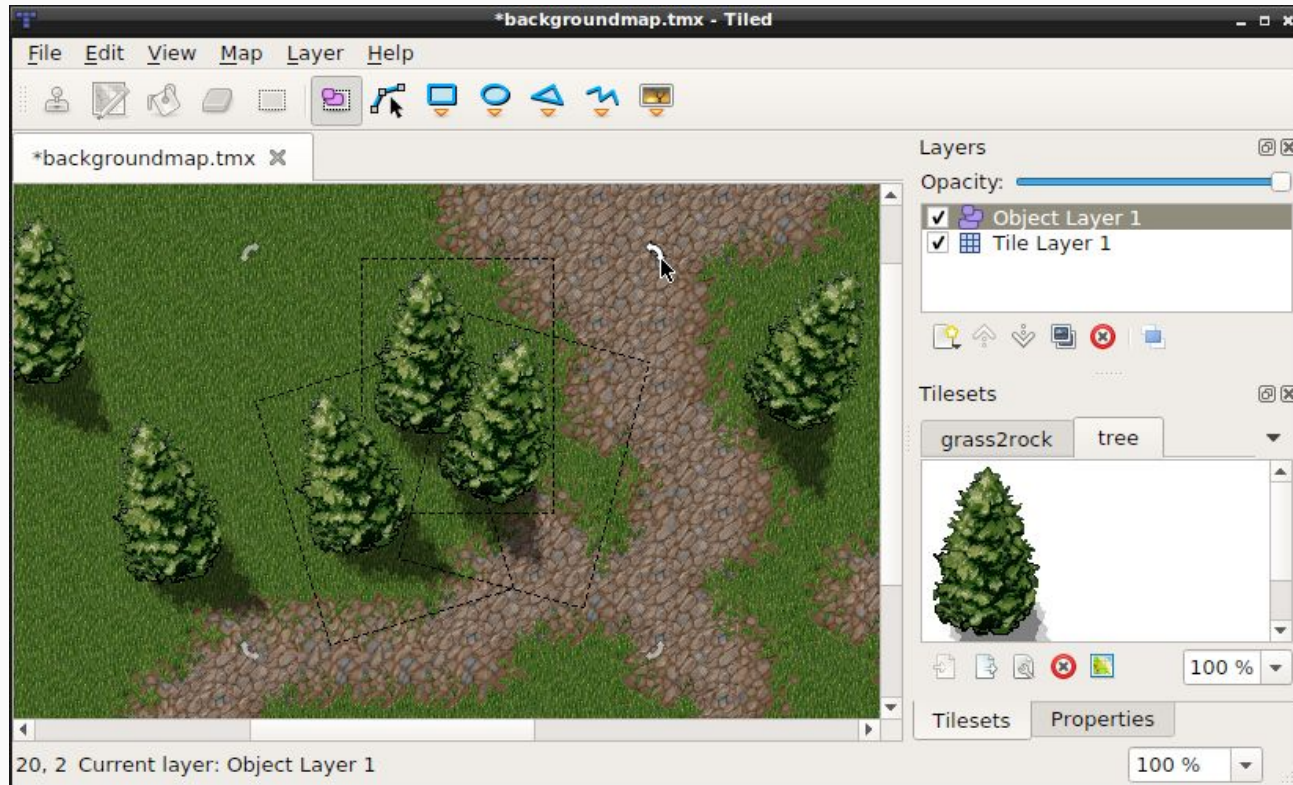
- Learning goals
- What we will learn
- Evaluation
- Rules
- Tools
- Observations



# Learning Goals

- Become proficient with C++
- Understand the building blocks of video games
- Get into data driven programming
- Understand isometric perspective
- Develop debug tools
- First glimpse into GUI programming

# Proper data read and write



# What we will learn

- Data Formats (XML)
- Load / Save
- Loading maps

# Map isometric rendering in [Diablo 2](#)



# What we will learn

- Orthographic vs. Isometric
- Metadata information on maps
- Pathfinding!



## Max Payne





# What we will learn

- FPS control
- Game Logic Time control
- Entity Management
- Event Systems

# GUI - WoW

The image shows a World of Warcraft raid interface during the Blood-Queen Lana'thel encounter. The raid is taking place in a circular arena with a large, ornate floor design. The boss, Blood-Queen Lana'thel, is visible in the center of the arena, surrounded by a large number of adds. The raid members are positioned around the arena, with various status effects and damage numbers visible above them. The interface includes a top bar with the raid name "Next Pact of the Darkfallen" and a timer "17.9". A right sidebar shows the boss's abilities and a list of raid members. A bottom bar displays the raid's progress, including the number of members, friends, armor, and other stats. A central panel shows the raid's damage and healing output, with a table of damage and healing numbers. A bottom-left panel shows the raid's status, including the number of members, friends, armor, and other stats. A bottom-right panel shows the raid's progress, including the number of members, friends, armor, and other stats.

Next Pact of the Darkfallen 17.9

Unsympathetic Alliance: 20 of 20

Spell is not ready yet  
Spell is not ready yet  
Spell is not ready yet

2492-3500 resisted

Range Check (10 yd)  
Vemi  
Ariya

REGENERATION 2.05  
MEMORIES OF LOVE 6.55  
ENERGIZED (8) 9.05  
SOOTHING (8) 14

19.1V/26.5K 7886/25.5K

Chidi	Gnomie	Lance	Trys
+42.6	+5.0	+3.4	+5.1
+5.8	+5.8	+5.8	+5.8
+5.8	+5.8	+5.8	+5.8

REGENERATION 5.65  
87.2% SHADOW BOLT 017/15 80.0% SHADOW BOLT

BLOOD-QUEEN LANATHIEL 38.1

[G] [kyoko]: man  
Shadows amass and swarm around Gnomedorell  
[G] [Kagami]: and people were just morons  
[G] [kyoko]: if u wipe the raid like 5 times in a row  
[G] [kyoko]: u should be on that list  
\*Blood-Queen Lana'thel yells: Just a taste...  
\*Blood-Queen Lana'thel\* Pact of the Darkfallen on Mistrustful, Rofnik.  
Nakatsu  
Hilakari: Unknown Spell School: 96

Healing Done

1. Inariel	2340797	(10380.0, 18.5%)
2. Chromosome	2144955	(9279.1, 16.8%)
3. Ariya	2054485	(8979.1, 15.9%)
4. Culp	1914072	(8228.0, 14.5%)
5. Rofnik	192836	(6378.1, 11.3%)
6. Lance	98889	(4492.6, 7.9%)
7. Rofnik	256477	(1145.8, 2.0%)

# What we will learn

- In Game Graphical User Interfaces:
  - Labels
  - Buttons
  - Text Input
  - Windows
  - Scrollbars

## Quake style console || Crysis console

```
CGF streaming: Loaded:2352 InProg:0 All:2352 Act:2352 MemUsed:131.50 MemReq:0.00 PoolSize:24
TexStreaming: MemUsed:698.01MB(109%) PoolSize:640MB Trghput:0KB/s
    r_GetScreenShot = 2 []
Screenshot: c:\users\admin\saved games\crysis3\ScreenShots\ScreenShot0019.jpg
Drawcalls: 0
FPS: 16.4 (40.5 ms)
Tris: 0,000
CGF streaming: Loaded:2352 InProg:0 All:2352 Act:2352 MemUsed:131.50 MemReq:0.00 PoolSize:24
TexStreaming: MemUsed:698.01MB(109%) PoolSize:640MB Trghput:0KB/s
    r_GetScreenShot = 2 []
Screenshot: c:\users\admin\saved games\crysis3\ScreenShots\ScreenShot0020.jpg
Drawcalls: 0
FPS: 29.1 (33.4 ms)
Tris: 0,000
CGF streaming: Loaded:2352 InProg:0 All:2352 Act:2352 MemUsed:131.50 MemReq:0.00 PoolSize:24
TexStreaming: MemUsed:720.51MB(112%) PoolSize:640MB Trghput:0KB/s
hud_hide 1
    hud_hide = 1 []
>hud_hide _
```

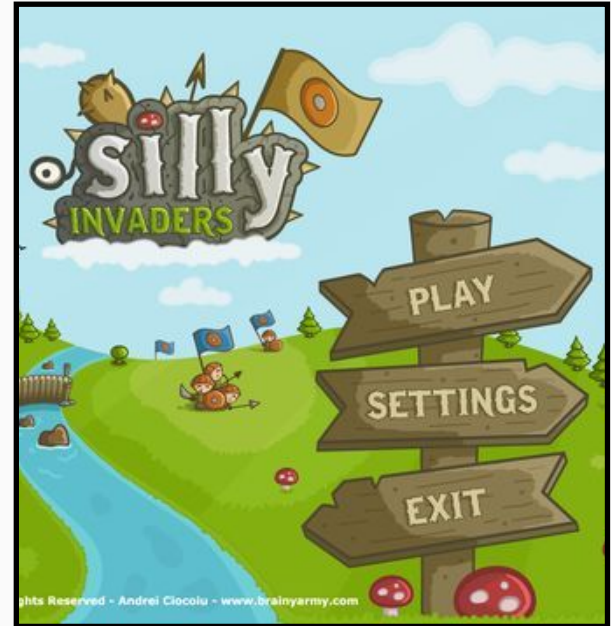
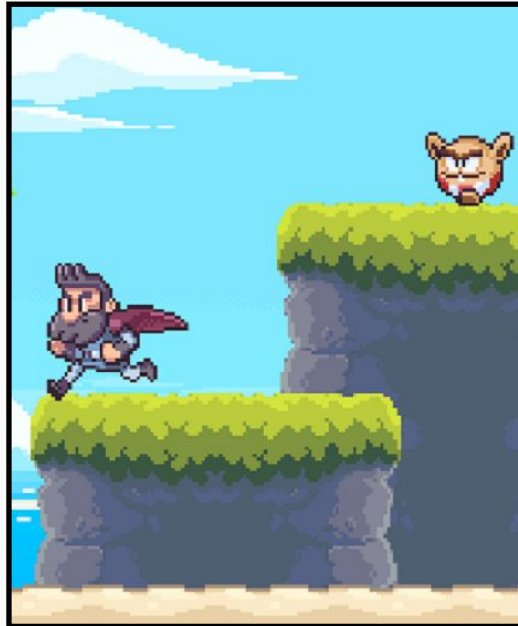


# What we will learn

- Performance analysis (Profiler)
- Development console
- Cvars for configuration



# We will build a platformer: Map + A\* + UI





Worth mention "*Parallax Paradox*" from 2018



Marc & Pol project from 2018 ended up winning some contest !



# Evaluation

## First Assignment:

- Counts as **15%**
- Before October 14th 23:59
- *Save/Load*
- *XML Parsing*
- *Map Rendering*
- *Collision and Logic import*

## Second Assignment:

- Counts as **15%**
- Before November 11th 23:59
- *Pathfinding*
- *Time control*
- *Performance monitoring*

# Evaluation

## Third Assignment:

- Counts as **20%**
- Before December 16th 23:59
- *All GUI*

## Game Innovation:

- Counts as **10%**

## Final Exam (theory):

- Counts as **40%**
- January 7th - 16th

## Revaluation exam:

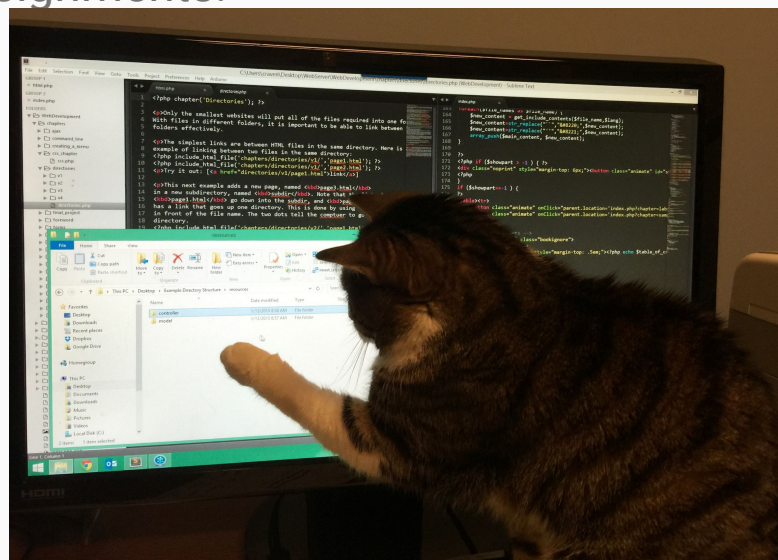
- Counts as **40%**
- Max grade is 5
- January 30th - February 5rd

# Rules

- Work is **done in groups of two**
  - Not to be change later but in extreme circumstances
  - Each github user should be used only by its own student!
- Code is expected to be:
  - **Clear**
  - **Consistent**
  - **Optimal**
  - **Original:** only once can trigger a zero for the whole subject

# Rules

- For the 10% grade for innovation on assignments:
  - Go beyond what is requested
  - Do some interesting **tech**
  - It is not an easy grade!
- Final exam will be done on paper:
  - It is done individually
  - Can be revaluated
  - No teamwork :)

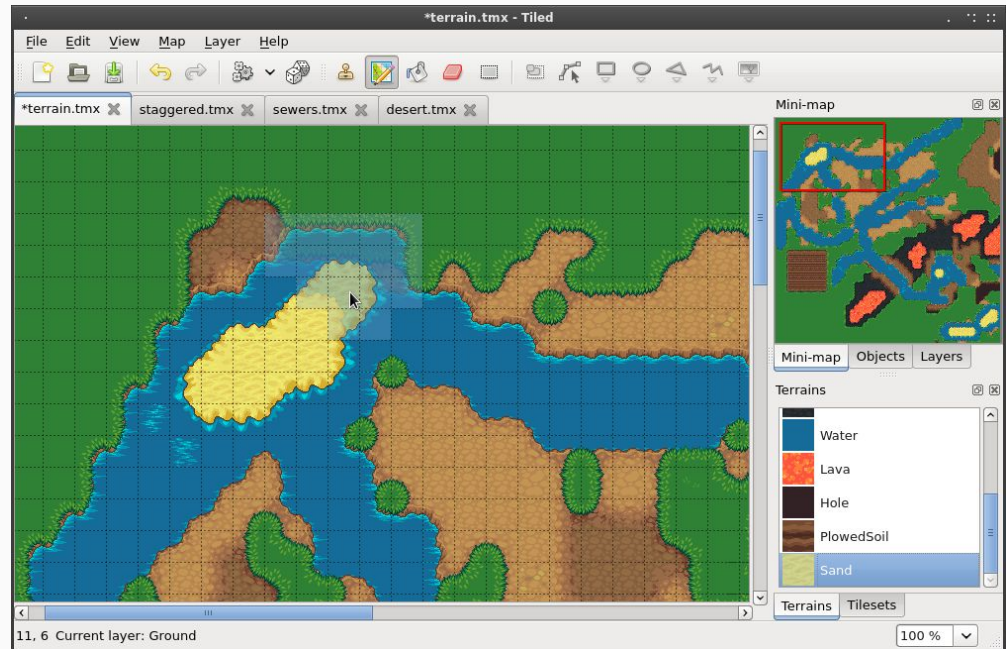




# Tools

We will build on last year code structure:

- Visual Studio 2017
- Github.com
- [Tiled](#)
- Brofiler



# Observations

- We will learn coding *for* video games
- Everything is about spending time coding
- You will start understanding the games you play
- All those building blocks will be used on **Project II** Subject next semester
- Have fun! :)
- <https://www.youtube.com/watch?v=nxtMnaDp6M4>

# Homework

Let's test our C++ skills: Create a new `vec3` class with

- Contains three values `x,y,z` with templated type
- Think of at least three handy constructors
- Operators `+`, `-`, `+=`, `-=`, `=`, `==`
- Methods: `normalize()`, `zero()`, `is_zero()`, `distance_to(vec3 ...)`
- Mind references and `const`!

Upload it to your github and will be reviewed next class.