Computer Game Development and Design

Jaanus Jaggo

2021
What you will learn

1. Game design theory
What you will learn

1. Game design theory
2. Game dev in Unity GE (C# language)
What you will learn

1. Game design theory
2. Game dev in Unity GE (C# language)
3. Game dev techniques and technologies
What you will learn

1. Game design theory
2. Game dev in Unity GE (C# language)
3. Game dev techniques and technologies
4. Game dev project management
Game development is hard work
About me

Software Engineering Assistant since 2016

Teaching:
- Computer Graphics
- Computer Game Development and Design
- Game Engines

Main focus
- Modern technologies
- Procedural generation
- Art creation workflows
- Visual effects
About me

- Indie game development history -> a lot of unfinished games, but some are finished
About me

- Unfortunately most of my cooler projects are not finished
About me

- Current project - BLASTRONAUT
Today’s topics

● Course organization
● Lectures, labs and project
● Introduction to game design
● First homework assignment
● Lecture task
Organization

6 EAP = 156h of work

Lectures: 15 * 1.5h = 22.5h

Labs: 15 * 1.5h = 22.5h

Homework: 20h

Projects: 91h

All the information: [https://courses.cs.ut.ee/2020/gamedev/fall](https://courses.cs.ut.ee/2020/gamedev/fall)
Grading

Some lectures give points: 10 points total

Solve tasks: 30 points (deadline 1 week, first task given today)

Complete project (3-4 students): 60 points

- Project milestone 1 (October)
- Project milestone 2 (November)
- Project milestone 3 (January)

Game jam bonus: 5 points (Granted only once)

- Ludum Dare 47 - October 2nd
  - [https://ldjam.com/](https://ldjam.com/)

91+ = A, 81-90 = B, 71-80 = C etc.
Projects

Rules:

- 3 students in group (4 if necessary but not 2)
- **No** extensive violence or improper material
- Milestones with **deadlines**
- Mandatory **presentations**
- **Requirements** in courses
- You can use any asset that you have the right to use (properly credited)

Games from last year:

- Hestia
- Slingshot
- Graviform
Schedule

15 lectures
15 practice sessions
1 project
Course Discord Server

- Find teammates
- Ask help
- Help other students
- Game dev related discussion

Join Discord now if you haven’t done it yet!
Lectures

- 30.08: Introduction (HW 2p)
- 06.09: Gameplay (HW 2p)
- 13.09: Game Mechanics (HW 2p)
- 20.09: Preproduction
- 27.09: Design Document Presentations
- 04.10: Graphics
- 11.10: Gamedev Lifecycle & UI Design
- 18.10: Polishing
- 25.10: Milestone 1 presentations
- 01.11: Animations
- 08.11: Sound Design
- 15.11: Level Design
- 29.11: Milestone 2 presentations
- 01.12: Modern Technologies
- 06.12: Procedural Generation
- 13.12: Marketing
- January TBA: Final presentation

**Bold** lectures are your presentations.

Participating in non-bold lectures will give 1 point (up to 10).

Game Design Homeworsks

- 1 week deadline (next Monday before the lecture)
- Up to 24h late -> 50% score penalty
- Submitted through Courses
Gameplay
Game mechanics
Preproduction
Graphics design, graphics pipeline
Game dev Lifecycle and UI design
Polishing
Animations
Sound Design
Level design
Lighting / Modern technologies
Procedural generation
Marketing
Labs

**Group 2** - Wednesday 12pm - 14pm,
   Delta room 2006

**Group 1** - Wednesday 14pm - 16pm,
   Delta room 2006

Preparing for labs: [https://courses.cs.ut.ee/2019/gamedev/fall/Main/Labs](https://courses.cs.ut.ee/2019/gamedev/fall/Main/Labs)
1. "Introduction to Unity" (Bird Game) - 2p
2. "3D game" - 2p
3. "Space Game" 1
4. "Space Game" 2 - 4p
5. "Project architecture and Setup"
6. "Tower Defence Game 1" - Gameplay
7. "Tower Defence Game 2" - Unity UI
8. "Tower Defence Game 3" - Game Content - 6p
9. "3D Graphics in Blender" - 1p
10. "Animations" - 2p
11. "Audio Modification and Integration" - 2p
12. "Level Design" - 2p
13. "Editor Scripting" - 1p
14. "3D Lighting & Advanced Effects" - 1p
15. "Procedural Generation" - 1p
16. "VR Game Design" - CGVR Lab Excursion
Any questions about the course organization?
Introduction to game design
A game is a type of play activity, in which the participant(s) try to achieve at least one nontrivial goal by acting in accordance with rules.
Gameplay

**Gameplay** - interactivity that the game induces:

How player interact with the game and how game world reacts to the choices.

Book: Game Design: Theory and Practice by Richard Rouse
Gameplay

Example 1:
In SimCity, the gameplay is **laying out** a city and **observing** the citizens that start to inhabit it.
Gameplay

Example 2:
In Doom, the gameplay is running around a 3D world at high speed and shooting its extremely hostile inhabitants, gathering some keys along the way.
Gameplay

Example 3:
In Civilization, the gameplay is exploring the world, building a society from the ground up, discovering new technologies, and interacting with the other inhabitants of the world.
Example 4:

In Need For Speed, the gameplay is steering a car on tracks while jockeying for position with other racers.
The gameplay does not include

- How the game-world is represented graphically
- Setting or story line of that game world
- What game engine is used
Task

This task will give one point for the current lecture.

Task has to be submitted to Discord lecture-tasks channel before the next lecture.
(next monday at 12.15)

Before submitting, change your discord name to include your real name and your order number in the points sheet (in courses):

● Go to our discord channel
● Right click on your name
● Change Nickname

Eg: 7 Mart Mets
Task

Description:

Choose an existing game that you like to play. Write its name and gameplay description (with one or two sentences), see the previous examples.

NB! Try to avoid describing the setting and artistic choices. For example it is not necessary to say that Super Mario is 2D game or its main character is a plumber man.
Game Design

Game Design - determines the form of gameplay.
Game Designer

**Game Designer** - is the person who designs the game, thereby establishing the shape and nature of the gameplay.

Source: [https://www.gamedesigning.org/career/lead-game-designer/](https://www.gamedesigning.org/career/lead-game-designer/)
Unique Selling Point (USP)

Game market is crowded

On average 24.7 games per day

What makes your game to stand out?

Source: Steam Spy and Grid Sage Games
Bad USP

- Permanent death
- Magical skills
- Character leveling
- Good story
- Good graphics

None of these things set your game apart. There are just so many games with these things.
Good USP

18 quintillion unique planets to explore!
Good USP

Create your own siegecraft to and blow things up!
Good USP

Time only moves when you move!
Good USP

Explore the deep scary ocean!
Good USP

Balance yourself on high speed moving trucks!
Unique Selling Proposition

What you do well

What the consumer wants

What your competitor does well

Source: https://landerapp.com/blog/unique-selling-proposition/
Something familiar and something new

Best game designs have always something familiar and something new.

What games you like to play and what would you change?
Brainstorming

- **Technique 1** - choose a side activity of a big game and make a new game out of it.

Gravity potion from Terraria
Brainstorming

- **Technique 1** - choose a side activity of a big game and make a new game out of it.
- **Technique 2** - think of an existing game, but change something significant.

Real time strategy game **BUT** all sectors are circles

Circle Empires (2018)
Brainstorming

- **Technique 1** - choose a side activity of a big game and make a new game out of it.
- **Technique 2** - think of an existing game, but change something significant.
- **Technique 3** - one game meets another. Take the core gameplay of two totally different games and combine them into something new.

Lemmings + Tetris = MouseCraft
Football Meets Crossy Road

Source: https://gadgets.ndtv.com/apps/features/one-more-pass-is-where-football-meets-crossy-road-841545
Homework 1 - Brainstorming

Watch the video: How to Choose a Theme for Your Game (5m 24s)
https://youtu.be/R_sear6P058

You will have to brainstorm 3 game ideas, using previous techniques.
For each game idea you have to specify the USP (with one sentence) and find an illustrative picture.

Submit: PDF document in Courses

Deadline: next monday at 12.15 (before the lecture)
Homework 1 - Brainstorming

Example

Game 1: “Indian Taxi Driver”

● **USP:** Drive a taxi in crazy Indian traffic.

New Delhi, India on 11/11/2017 © travelwild / Shutterstock
Homework 1 - Brainstorming

Example

Game 2: “Witch Apprentice”
- **USP:** Create strange potions while knowing nothing about it.

![Witch Apprentice Game Image](image_url)

Artist: Dan Hammonds
What you learned today

● How to pass this course and get a good grade
● What topics will be coming
● What is Gameplay and Game Design
● How to define a good USP for a game
● Tips for brainstorming a game
Next lecture - Gameplay

What makes games fun?

How to define your gameplay?

Game genres

Platform game
Shooter game
Beat 'em up
Stealth game
Survival game
Battle royale game
Rhythm game
Group task

Form groups of 3 to 4 people.

1. Each person chooses one of their favourite game, or game they recently played.
2. Determine the USP of this game, tell it to others and let them guess what game it is.