# Technology-driven Experimental Game Design

https://chalmers.instructure.com/courses/11010

Marco **Fratarcangeli**

Michael **Heron**

Mafalda **Samuelsson Gamboa**

Mads **Rønnow**

Erik **Hildinge**

# Aim of the course

- Computer game and game development are often tied intrinsically to the develop of new technology.

- The potential use of new technology, however, is typically easier to identify regarding graphics, sound, networking, and even business aspects than regarding the **core** of a game,

*its game mechanics or gameplay.*

- The course *technology-driven experimental game design* focuses upon developing skills for *understanding* and *applying* new technologies specially towards enabling new forms of gameplay.

**EVERYONE 10+**

E 10+

®

**ESRB**

Mild Language

Alcohol Reference

Fantasy Violence

# Modules

- **Module 1:** Creativity methods.   One week

- **Module 2:** Real-time physics-based animation. Three weeks

- **Module 3:** Augmented reality. Three weeks

# Teachers and Supervisors

- Marco Fratarcangeli (marcof@chalmers.se)
  Examiner and lecturer 2nd module

- Michael Heron (heronm@chalmers.se)
  Lecturer 3rd module

- Mafalda Samuelsson Gamboa (mafalda.gamboa@chalmers.se)
  Lecturer 1st module

- Mads Rønnow (ronnow@chalmers.se)
  Teaching Assistant

- Erik Hildinge
  Teaching Assistant

# Third run of the course

- Many differences from the past year.
  - Course is completely remote
  - VR -> AR
  - Unreal -> Unity

- Eager to receive constructive feedbacks!

- Double check all the information on Canvas.

- TimeEdit is the official schedule.

- Check also the Course Summary.

# Prerequisites

- Common data structures (arrays, lists, etc.).

- Knowledgeable in fundamentals of
  - Algebra and geometry (vector calculus, trigonometry, …)
  - Analysis (derivatives, multivariate calculus, …)
  - Physics (mass, weight, force, acceleration, velocity, position, …)

- We don't assume any knowledge in Unity or C#

# Learning Objectives

- **List** potential for new game mechanics and gameplay of two different technologies

- **State** creativity methods and techniques for applying new technologies to gameplay

- **Develop** and explore new gameplay produced by using new technologies

- **Present** new aspects of a game's gameplay based upon the new technology used

# Learning Objectives

- Apply creativity methods on a new technology for creating new gameplay

- Analyze potential advantages and disadvantages of various new technology-driven gameplay possibilities given the context of specific user groups

- Assess ethical and societal issues of wide-spread adaptation of new technology-driven gameplay

# Grading & Evaluation

- The assignment for each module is graded U|3|4|5 or U|G|VG
  - Assignments are handed in using Canvas
  - See Course Summary on Canvas for all the deadlines

- Chalmers
  - To receive a 3+ for the course one needs 3+ on all assignments
  - The specific grade is the average of the grades on all assignments

- GU
  - To receive a G for the course one needs G on all assignments
  - To receive a VG for the course one needs VG on 2 majority of the assignments

- Student representatives
  - Selected randomly by us
  - Volunteers?

# Practical details

- Exercises, supervision, presentations are completely remote through zoom.

- Details are presented in the pages for each module.

# Module 1: Creativity Methods

Mafalda Samuelsson Gamboa

# Module 1

- Provide theories and methods on creativity

- Takes a stance that creativity is a skill

- Exercises in being creative

- Purpose is to provide you with a skill set to be used in the two other modules

# Module 2: Physics-based Animation

Marco Fratarcangeli and Mads Rønnow

# Module 2

- Get hands-on experience in Unity

- Physics entities for engaging gameplay, and their limitations
  - Rigid bodies
  - Hard and soft constraints
  - Particle systems
  - Colliders and triggers

- Develop and explore with physics-based game mechanics
  - Labs for clones of three games: Gish, Pachinko and Osmos

# Module 3: Augmented Reality

Michael Heron and Erik Hildinge

# Module 3

- Familiarity with current AR technology
  - Including practical experience with games, apps and development

- What works, why and how
  - What can you do – what should you do
  - How to do it – using Unity Engine

- Understand current limitations
  - And current + upcoming solutions

# Thank you!

Questions?