What is a Game?

Introduction, Terminology, History

Martin Čadík cadik@fit.vutbr.cz
Tomáš Polášek ipolasek@fit.vutbr.cz
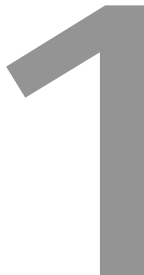
Brno University of Technology

Faculty of Information Technology
DCGM, CPhoto@FIT
Faculty of Fine Arts
Game Media Studio

1

Course Introduction

- The Goal
    1. Introduction into Game Development
    2. Unity as an Example Platform
    3. Game Development Processes
- The People
    ‣ Guarantor : doc. Ing. Martin Čadík, Ph.D.
    ‣ Deputy Guarantor : MgA. Vojtěch Vaněk
    ‣ Instructors : doc. Ing. Martin Čadík, Ph.D.
                    Ing. Tomáš Polášek
- The Institutions
    ‣ BUT FIT, Department of Computer Graphics, CPhoto@FIT
    ‣ BUT FFA, Game Media Studio
- The Places and Times
    ‣ Lectures : Weekly, 13×, BUT FIT in D0207, 13:00-14:50

Syllabus Overview

- Lectures

- Exercises

- Evaluated Activities
  - Practical exercises up to $7 \times 6 = 42$ points
  - Game Jam project up to 58 points
- Assignments
  - Task specification released for the specified week
  - Can be submitted until the end of the semester
- Requirements
  - At least 2 points from each exercise
  - Mandatory Game Jam project, at least 24 points
  - Minimum 50 points to pass the course

JASON GREGORY. *GAME ENGINE ARCHITECTURE, SECOND EDITION.* 3rd. USA: A. K. Peters, Ltd., CRC Press, 2018. ISBN: 1351974288

JESSE SCHELL. *THE ART OF GAME DESIGN: A BOOK OF LENSES.* USA: A. K. Peters, Ltd., CRC Press, 2019. ISBN: 1138632097

R. NYSTROM. *GAME PROGRAMMING PATTERNS.* UK: Genever Benning, 2014. ISBN: 0990582906

UNITY TECHNOLOGIES. *UNITY USER MANUAL.*
https://docs.unity3d.com/Manual/index.html

PATRICIO GONZALEZ VIVO AND JEN LOWE. *THE BOOK OF SHADERS.*
https://thebookofshaders.com. 2015

Study Literature

Raph Koster. *Theory of Fun for Game Design.* 2nd. USA: O'Reilly Media, Inc., 2013. ISBN: 1449363210

Jesper Juul. *The Art of Failure: An Essay on the Pain of Playing Video Games.* 2nd. UK: The MIT Press, 2016. ISBN: 0262529952

Simon Egenfeldt, Jonas Heide Smith, and Susana Pajares Tosca. *Understanding Video Games: The Essential Introduction.* 4th. USA: Routledge, 2019. ISBN: 1138363052

Ian Millington. *Game Physics Engine Development.* 2nd. USA: M. K. Publishers Inc., 2010. ISBN: 0123819768

Ian Millington and John Funge. *Artificial Intelligence for Games.* 2nd. USA: M. K. Publishers Inc., 2009. ISBN: 0123747317

David H. Eberly. *3D Game Engine Design.* 3rd. USA: CRC Press, 2018. ISBN: 1138047853
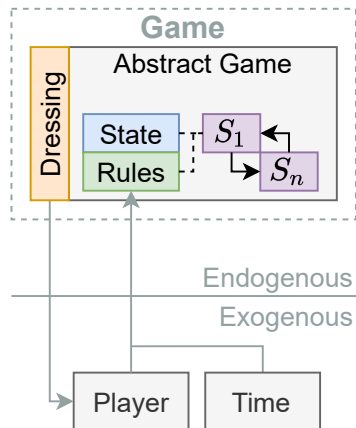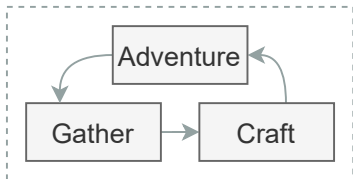
Definition of a Game

A game is 1) a rule-based formal system with 2) variable and quantifiable outcome, where 3) different outcomes are assigned different values, 4) the player exerts effort in order to influence the outcome, 5) the player feels attached to the outcome, and 6) the consequences of the activity are optional and negotiable.

Jesper Juul
The Game, the Player, the World
Half-Real [5]

Game

Abstract Game

- Game = Abstract Game + Dressing
- Play = Interaction with the Game
- Computer Game = Game using Digital Device
- Game Design -> Rules and Structures
- Game Development -> Complete Game
- Game Mechanics = Rules and Emergent Behavior
- Gameplay = Interactivity of Player $\leftrightarrow$ Game
- Core Gameplay Loop = Flow of the Game

Dressing

State — S_1

Rules — S_n

Endogenous

Exogenous

Player   Time

Adventure

Gather → Craft

Good games are **Fun**

Getting into the **Flow**

Other good **Reasons**

Practice, Meditation, Storytelling, Comfort

See Csikszentmihalyi [1], Juul [6], Koster [8]

- Games are Complex
- Games are Interactive
- Technology is Mutable
- Tools are Evolving [1]
- Games are Creative
- Required Testing

It's a miracle that *any* game is made.

Anonymous [13]

- Making Games is **Hard**

---

[1]Graphics-Outside the Box by Mark Ferrari

History of Video Games

The Royal Game of Ur
Source: The British Museum

Ludwig Hellwig's Wargame
Source: Strategie Spielen

Hnefatafl
Source: Museum of Ireland

Senet
Source: Brooklyn Museum

2600 – 2400 BCE

1390 – 1353 BCE

900 – 1100 CE

1780 CE

$-\infty$ 1960 1970 1980 1990 2000 2010 2020 $+\infty$
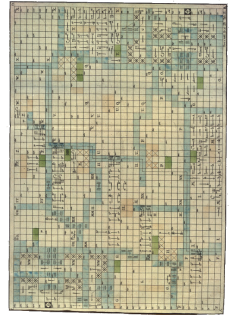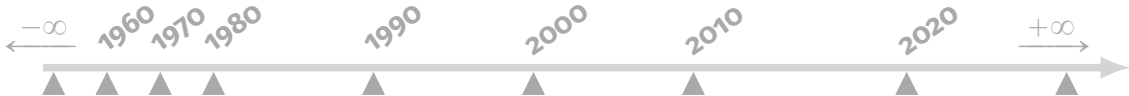
Spacewar! on PDP-1
Source: Computer History Museum

Atari Pong Cabinet
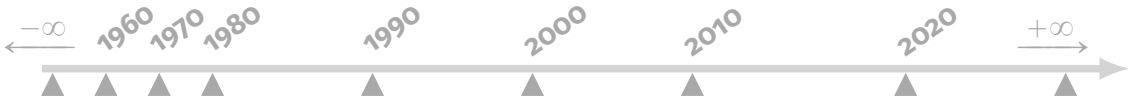Source: Neville Public Museum

Atari 2600
Source: Vanamo Game Museum

Space Invaders
Source: Arcade Museum

1962

1972

1977

1978

$-\infty$ 1960 1970 1980 1990 2000 2010 2020 $+\infty$

Commodore 64
Source: Vanamo Game Museum

Sega SG-1000
Source: Vanamo Game Museum

Nintendo Famicom (NES)
Source: Vanamo Game Museum

1982

1983

1983

$-\infty$ 1960 1970 1980 1990 2000 2010 2020 $+\infty$

Nintendo Game Boy
Source: Vanamo Game Museum

Introduction of 3D Graphics
Source: id Software

Rise of PC Games
Source: Blizzard, MicroProse, Valve

1989

1991, 1992, 1993, 1996

1991, 1995, 1998

$-\infty$ 1960 1970 1980 1990 2000 2010 2020 $+\infty$

Sega Saturn
Source: Vanamo Game Museum, MobyGames

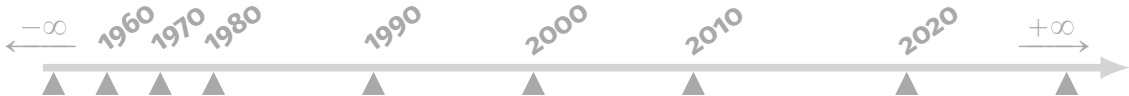1994

Sony PlayStation
Source: Vanamo Game Museum, MobyGames

1994

Nintendo 64
Source: Vanamo Game Museum, MobyGames

1996

$-\infty$ 1960 1970 1980 1990 2000 2010 2020 $+\infty$

6th Generation Consoles
Source: Vanamo Game Museum

Online Multiplayer Games
Source: EA, Linden Lab, Blizzard

Video Game Modding
Source: Online

1990S

1997, 2003, 2004

2000, 2001, 2001

$-\infty$ 1960 1970 1980 1990 2000 2010 2020 $+\infty$
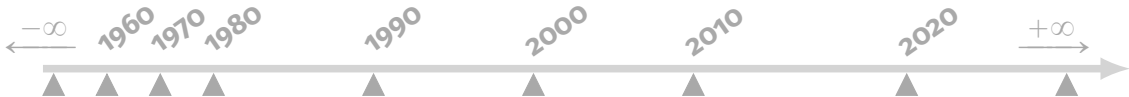
Rise of the Indies
Source: Microsoft, Team Meat, Mojang

2008, 2010, 2011

The Console Wars
Source: Vanamo Game Museum

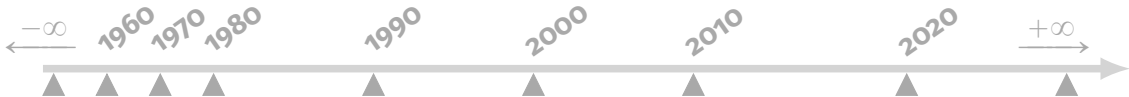2005/2013, 2006/2013, 2012/2017

DLC, MTC, Loot Boxes
Source: Bethesda, EA, Valve

2006, 2008, 2010

$-\infty$ 1960 1970 1980 1990 2000 2010 2020 $+\infty$

Virtual Reality
Source: Nintendo, HTC, Oculus, Sony

1996, 2015, 2016

AR & VR Games
Source: Nintendo, Beat Games, Valve

2016, 2016, 2020

Focus on Visual Realism
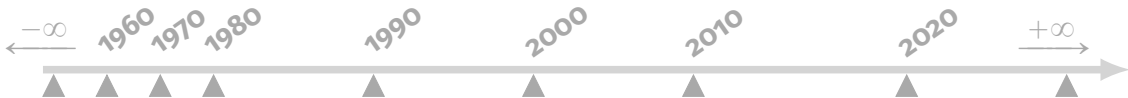Source: AMD, NVidia, CD Projekt

2010s and 2020s

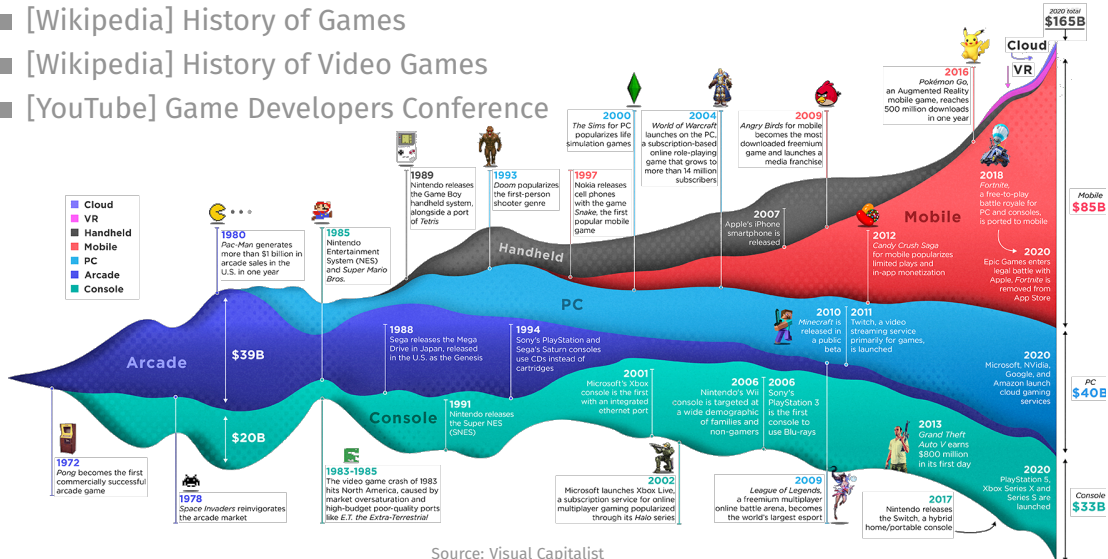−∞   **1960**   **1970**   **1980**   **1990**   **2000**   **2010**   **2020**   +∞

?

Market Growth

AAA $\times$ Indie Schism

Focus on Fidelity

Up to you!

$-\infty$ 1960 1970 1980 1990 2000 2010 2020 $+\infty$

- [Wikipedia] History of Games
- [Wikipedia] History of Video Games
- [YouTube] Game Developers Conference

Source: Visual Capitalist

Thanks For Your Attention!

Kings Quest V

[1]   Mihaly Csikszentmihalyi. *Flow: The psychology of optimal experience.* Vol. 1990. Harper & Row New York, 1990. isbn: 0060920432.

[5]   Jesper Juul. *Half-Real: Video Games between Real Rules and Fictional Worlds.* UK: The MIT Press, 2005. isbn: 0262101106.

[6]   Jesper Juul. *HalfReal: A dictionary of video game theory.* https://www.half-real.net/dictionary/. 2005.

[8]   Raph Koster. *Theory of Fun for Game Design.* 2nd. USA: O'Reilly Media, Inc., 2013. isbn: 1449363210.

[13]   Jason Schreier. *Blood, sweat, and pixels : the triumphant, turbulent stories behind how video games are made.* English. 2017.