

## A heuristic taxonomy of computer games

Written by Andreas Schiffler

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When analyzing computer games, categorizations are very helpful. This text summarizes important video game categories and their sub-categories.

### Introduction

Computer games are an area of gaming in their own right and a relatively recent phenomena in our culture. Arguably the first game was *Spacewar* by S. Russel (1962) which evolved as a spare-time software development on scientific computer equipment. In a computer game, the computer participates in many roles: as referee or oponent, representing a playing field or any number of elements using animated graphics, simulating the element of chance and the physics of a gameworld, immersing the player into a virtual arena with sound and sometimes haptic input devices. The most common genre, from the time of the conception of computer games with "Pong" to today's violent 3D-shooters, are games which emphasize hand-eye coordination, or so called *action games*. But there are many other classes of computer games, including new ones with social elements which are made possible by the availability and ubiquity of the global Internet. There are also many cross-over genres that combine features from more than one class or sub-class of the game taxonomy that follows. Thus what follows is a heuristic taxonomy.

### Action Games

Actions games are the largest class of computer games and are typically recognized as defining the genre since most original arcade games were of this type. These games place fast reflexes and coordination ability (hand-eye-coordination skill) as criteria of the players success while playing the game. Current action games may also place high demands on the tactical reasoning skills of the player. They feature violent physical force, especially shooting, as their main interactive feature.

Action games can be subcategorized into a number of distince genres based on their theme or

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the technology used:

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**Early action games** frequently used a combat or space theme due to the abstract nature of the graphics that were capable with the hardware of the time and the preference of the player in the 80s ( *Asteroids* – Atari/1979, *Defender* – Williams/1980, *Galaga* – Midway/1981, *Star Wars* – Atari/1983).

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**Maze games** involve some form of maze as the playing field ( *The Amazing Maze Game* – Midway/1976, *Pac-Man* – Bally/Midway/1981, *Bomberman* – Nintendo/1985). Today this genre is completely absorbed as a standard component in most gameworld layouts of Platform or Shooter games.

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**2D Platform games** are characterized by the players character having to move around platforms and ledges visualized on a scrolling 2D gameworld ( *Donkey Kong* – Nintendo/1981, *Pitfall!* - Activision/1982, *Super Mario Bros* – Nintendo/1985).

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**Fixed shooters** are a very influential early genre where the player controls a weapon with varying degrees of freedom (an adaptation of a shooting gallery) to destroy enemies on a single screen. ( *Space Invaders* – Midway/1978, *Centipede* – Atari/1980, *Galaga* – Midway/1981, *Area 51* – Atari/1995).

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**Slide shooters** (or scrolling shooters) are a variation of the fixed shooting genre which uses a playfield that is larger than the screen shifting horizontally, vertically or multi-directional (*Vanguard*

– Centuri/1981,  
*1942*

– Capcom/1984,  
*Darius*

– Taito/1986,  
*Raiden*

– Fabtek/1990)

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**Competitive fighting games** (or One-on-One fighting games) use two player chosen character which fight each other using interactively controlled moves (

*Yi-Ar-Kung-Fu*

– Konami/1985,

*Street Fighter II*

– Capcom/1991).

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**Beat 'em Up fighting games** (or side-scrolling fighting games) is a game genre where the player fights through a horde of computer-controlled enemies in a series of side-scrolling stages, typically with a powerful boss enemy at the end (

*Master*

DataEast/1984,

*Double Dragon*

– Technos/1987).

*Kung Fu*

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**Isometric games** are a form of 2D Platformers which present a three dimensional scene by compositing two dimensional graphics that display the world with a fixed camera orientation and without perspective. (*Congo Bongo* – Sega/1993)

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**3D Platform games** are the extension of the 2D Platformers using more advanced graphics but keeping the general gameplay similar to their 2D origins ( *SuperMario 64* – Nintendo/1996).

**First-Person shooters (FPS)** are characterized by an on-screen view that simulates the character's point of view and are almost always centered around the act of aiming and shooting weapons ( *Wolfenstein 3D* – ID Soft/1992, *Doom* - ID Soft/1994, *Quake II* - ID Soft/1996, *Unreal* – Epic/1998, *Half-Life* – Sierra/1999).

**Third-Person shooters (TPS)** employ a third person camera perspective while in many cases retaining the FPS-style character control and game characteristics ( *Max Payne* – Rockstar Entertainment/2001, *Resident Evil: 4* – Capcom/Ubisoft/2005).

**Survival Horror** games are a particular sub-genre of a TPS in which is defined primarily by theme rather than gameplay style. The subjective nature of make survival horror a difficult genre to classify. Typically the player has to battle opponents in claustrophobic environments in a third-person perspective, with the gameworld using liberal amounts of horror elements and isolation themes ( *Silent Hill* series – Konami/1999-2006).

### Strategy Games

The focus in strategy games is the combination of analytical skill and tactics as the player must balance the relation between resources and various elements in the game, emphasizing cogitation rather than manipulation. Games exist on a continuum from pure skill to pure chance, and strategic games are usually found towards the skill end of the spectrum. The turn-based games defined the genre up through the 1980's due to their modest demands on processing power and evolved to feature action sequences and a more character-oriented narratives. Types of strategy-games are for example god-games or wargames. Many simulator games are also considered strategy games when their general theme is centered around the simulation of complex socio-economic systems rather than a physical gameworld (*Tycoon* or *Age of Empires* series of games).

The genre is typically divided in two subtypes based on the pacing of the gameplay:

**Turn based strategy games** proceed in phases or turns with breaks in between player moves much like traditional board games such as Chess (*Defender of the Crown* - Cinemaware/1984, *Pirates* - Microprose/1987, *Civilization* - MicroProse/1991) or traditional D&D style role playing games (*The Elder Scrolls* series - Bethesda Softworks/1994-2006, *Final Fantasy II* - Square Co Ltd./1988).

**Real-time strategy games** the action proceeds continuously - or in 'real-time' - which lead to qualitatively different dynamics and faster gameplay (*SimCity* - Maxis/1990, *Populous* - Bullfrog/1989).

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### *Dune II*

– Westwood Studios/1993,

### *Warcraft*

– Blizzard/1994,

### *Age of Mythology*

– Ensemble Studio/2002).

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**Massively Multiplayer Online Role-playing Games (MMORPG)** have their roots in an D&D style fantasy role-playing games as well but extend it to implement a large online gameworld that is shared by many players simultaneously. (

### *MUDs*

– R.Bartle/R.Trubenshaw/1978,

### *Neverwinter Nights*

– AOL/1991-1997,

### *Ultima Online*

– Origin Systems/1997,

### *EVE*

– CCP Games/2003).

## Adventure Games

The genre of adventure games focuses on presenting the player with an interactive system for storytelling and narrative to explore. Its game principle typically imposes a high demand of logical thinking and persistence from the player. The game presents a loose structured sequence that can be compared with a parts of a movie and stops at intervals demanding the solution of tasks or riddles in order for the narrative to progress. Historically the genre progressed through several phases as the storytelling used increasingly complex technology:

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1976-1984: The gameworld is constructed from **textual** descriptions and the player interfaces using text entry. (*Adventure* – W.

Crowther/D. Woods, 1976,

*Zork*

– Stanford Univ./1979).

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1984-1993: **2D graphics** are added to the gameworld and menu based interactions are used to improve playability (*King's Quest* – Sierra/1984, *Maniac Mansion* –

Lucas Arts/1987).

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1993-1997: Graphics is further enhanced by incorporating **film** elements (*Gabriel Knight II-The Beast Within* –

Sierra/1996))

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1997-2006: Highly **interactive 3D environments** are used to visualize the gameworld and allow complex interactions (*Ultima* –

Origin/1997,

*Everquest*

- Verant Interactive/1999,

*Asheron's Call*

– Microsoft/1999,

*Lineage: The Blood Pledge*

- NC Interactive/2000).

## Simulation Games

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Most simulation games attempt to convey a concrete experience and place realism as the an important if not the most important goal for its game design. The player needs to master complex principles that have no direct relation to external reality to succeed in these types of games. These game can be free-form simulations, with no plot or mission system as found in other genres.

Early games in this genre include *Lunar Lander* (Atari/1979) which a space-physics theme and *Battlezone* (Atari/1980) which was later called the first commercial Virtual-Reality game. Other categories from the beginnings of computer games are:

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**Early Sports games** modeled existing sports as simple graphics and interactions (*Pong* – Bushnell/1972).

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**Early Race games** were simple driving simulations and their key feature being an early implementation of simulating the first-person or third-person perspective of the player (*Night Driver* – Atari/1976, *Pole Position* – Namco/1982).

The more “traditional” categories of simulation games are:

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**Flight Simulators** are extensively used in the aviation industry to train pilots, but made their mark early in computer game history and continue to be a very popular genre that provides

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accurate and interactive simulation of flying crafts ( Corporation/1985, *Microsoft Flight Simulator 2000* – Microsoft/2000).

*Jet - Sublogic*

*Mic*

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**Space Simulators** are an extension of flight simulators into space but should not be mixed up with space-themed strategy- or action-games ( Microsoft Game Studios/1994, *Space Combat* – Laminar Research/2004).

*Microsoft Space Simulator –*

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**Driving/Racing Simulators** attempt to more or less accurately (ie. less in arcade-style simulators) simulate vehicle or race driving involving sometimes some of the most accurate physics simulations of all games genres ( Crammond/1986, *NASCAR* – Papyrus/1994, *GT Legends* – Atari/2005).

*REVS – G.*

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**Boat/Submarine Simulators** are games where players command a submarine or control a sail-boat ( Spectrum Holobyte/1985, *Silent Hunter* – SSI/1996).

*Submarine Commander – Thorn EMI/1982, GATO –*

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**Sports Simulators** typically emphasize actually playing the sport (such as the *Madden NFL* series - Electronic Arts/1984-today), while others emphasize the strategy behind the sport (such as *Championship Manager* - Domark/1992) or satirize the sport for comic effects (such as *Arch Rivals* – Midway/1989). Almost all sport categories are covered by computer simulations including

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individual and team sports (

*Track & Field*

– Konami/1983,

*Sensible Soccer*

– Renegade Software/1992,

*Tiger Woods PGA Golf*

series – Electronics Arts/1998-2006).

The following categories, while simulators in their own right are considered more strategy games than simulator games:

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**Building Simulators** involve the creation of a virtual city or building on the computer via the gameplay and might be specialized economic simulators ( *SimCity* – Brotherbund/1989).

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**Fictional Life Simulators** are intended to simulate a fictional world through a mixture of skill, chance, and strategy to simulate usually a narrow aspect of reality ( *The Sims* – Electronics Arts/2000).

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**Business or Economic Simulation Games** focus on simulating an economy or business and is seldom encountered as stand-alone game but usually a game element on other strategy or simulation games ( *Capitalism* – Interactive Magic/1995).

### Puzzle Games

The traditional game of solving puzzles can be found as well in many computer games. Computer driven puzzle games can be highly unique but also very frustrating to the player, since the machine can usually solve the puzzle a player might work on for hours in mere milliseconds. Many real puzzle games such as jigsaw puzzles and the Rubik's Cube can be presented digitally, but are not considered typical computer game genres.

One can identify the following computer-specific puzzle games genres based on the challenges created by the game design:

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**Visual Matching** puzzles use player controlled blocks or elements to create patterns which score points or advance the game and include “the greatest video games of all time” (

*Tetris*

– A. Pazhitnov/1985) and its many variations.

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**Hidden Object** puzzles involve the interactions of the player with a playfield to deduce locations of otherwise invisible objects and include “the most time wasting game of all time” (

*Minesweeper*

– R. Donner/1989) included in most versions of Windows.

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**Character Control** puzzles involves controlling game characters using a set of commands and executing them in an efficient way to achieve the game goal (

Psygnosis/1991,

*Oddworld*

series – GT Interactive/Microsoft/EA/1997-2005).

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**Construction** puzzles involve typically the creation of a series of “Rube Goldberg devices” - arrangements of a collection of objects in a needlessly complex fashion so as to perform some

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simple task ( *The Incredible Machine* series – Dynamix/EA/1993-2001, *Crazy Machines* series – PepperGames/2002-2005).

## Educational Games

When a game is designed to teach or train during gameplay, the game is called an edutainment games due to the combination of education and entertainment in “one package”. In edutainment games, the primary design focus is on the teaching part and game content is usually well-researched, designed around teaching principles or based on an actual curriculum.

Educational games make use of the whole variety of general game genres and teaching subjects making it hard to categorize specifically:

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**Child Education** games use memory, drill, puzzle and logic elements in the gameplay and target elementary and secondary level children through a variety of game styles and typically ample amounts of multimedia content ( *Carmen Sandiego* series – Broderbund/The Learning Company/1983-2004, *Zoombinis* – The Learning Company/1997, *Urban Jungle* – Gov. of Croatia/2005).

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**Serious Games** (SG) is a subcategory of educational games where the primary focused of the audience is outside of primary or secondary education and might include marketing or advertising goals besides training ( *America's Army* – US Army/2002-2005, *Re*

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### *Mission*

– HopeLab/2005).

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**Programming Games** revolve around the task of writing a program in a domain-specific programming language in order to control the actions of the game elements or characters (

### *Core War*

- D.G. Jones/A.K. Dewdney/1984,

### *Robot Battle*

– GarageGames/2002).