Structuring Gametime
A Typology of the Temporal Constituents of Video Games

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This presentation will introduce a typology of the formal aspects of the video game medium (see table 1) that determine and structure its temporality. Both elements previously described by other scholars (e.g. Eskelinen 2001, Wolf 2002b, Crawford 2003, Jenkins 2004, Schell 2008, Hitchens 2006, Nitsche 2007, Zagal et al. 2008, Zagal & Mateas 2010) and those observed in my personal research are classified in three groups: (1) *change of state*, (2) *space-time*, and (3) *conditions*.

Change of State	Space-Time	Conditions
Events	*Navigation*	*Time Gauges*
Pace	*Location*	*Turns*
Cycles	*Space-Time Obstacles*	*Progression*
Pause	*Triggers*	*Objectives*
Layers	*Stages*	
Reset		

Table 1: Typology of temporal constituents of video games

"Change of state" includes all the elements that relate to the production and unfolding of the building blocks of time: *events*. An event is defined as any change in the game state which is observable on the audiovisual layer of a game—if a pixel blinks or moves in one direction, that can be considered an event. These events can unfold at different *paces*, in *cycles*, and they can be *paused* or *reset*. They also take place on different *layers* of the game, such as the three-dimensional gamespace where players controls the character directly and menus where they can buy or upgrade items.

"Space-time" analyzes how the design of a game's space directly influences its temporality. If a player needs to *navigate* from A to B, the further away B is from A, the longer it will take them to get there. The *location* of entities in space also determines a sequence of events. Entities located closer to A than to B will be encountered first. *Space-time obstacles* are features of the gamespace that deny access to a point that is close in space, such as a door that requires a key to be opened. This forces the player to continue navigating in search for the item and then to backtrack to

open the door (subverting the above-mentioned principle of location). In this way, parts of a stage can be further away in time than they are in space. *Triggers* are entities that react to other entities (Valve Developer Wiki 2016), initiating events. Through the use of triggers, events can be timed with the arrival of the player character to a specific point in space. The gamespace can also be divided into discrete units or *stages* that can only be accessed sequentially and hence determine a temporal order.

Finally, "conditions" looks into the mechanics and rules of games and how these affect time. *Time gauges* determine how long a player has to accomplish something (e.g. underwater oxygen bars) or keep track of how much time a player needs to complete an activity, which can have an impact on the final reward. *Turns* are discrete units of time that determine which player is allowed to play. In chess, for example, the white pieces move on the first turn, the blacks on the second, and alternate in this way until the game is over. The *progression* of a player character or the gameworld also influences a game's temporality. In RPGs there is a more or less strict sequence in which character skills can be unlocked—low-level skills first, and high-level skills last. The *objectives* that the player needs to accomplish can also have an impact on the time of a game, since the completion of one task might be contingent on the completion of a previous one.

The aim of this paper is to systematize the work of game scholars on video game temporality into one typology that can serve as a practical tool for analysis. Additionally, the space-time category adds a dimension of time in video games that has been so far largely overlooked. Space in video games has been analyzed in numerous articles and books (e.g. Murray 1997, Aarseth 2000, Wolf 2002a, Fernández-Vara et al. 2005, Nitsche 2008), but the literature is still missing an examination of its close connection to time. This paper seeks to fill that gap.

In the presentation, I will describe all of the above-mentioned elements in further detail and illustrate each with examples from numerous games, such as *Super Mario Bros.* (Nintendo Creative Department 1985), *Super Metroid* (Nintendo R&D1 Intelligent Systems 1994), *Myst* (Cyan 1993), *The Ultimate Doom* (id Software 1995), *Half-Life* (Valve Corporation 1998), *Mass Effect* (BioWare 2007), *Portal* (Valve Corporation 2007), *Canabalt* (Saltsman 2009), and *The Witcher 3: Wild Hunt* (CD Projekt RED 2015). This typology can prove useful to both game scholars as a catalogue to analyze time in specific games and to game designers as a list of ingredients that can be used to give rise and structure a game's temporality.

Keywords
Time, space, typology, formal analysis

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