Juiciness
Exploring and designing around experience of feedback in video games

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Abstract

This project aims to explore the effects of feedback over experience in video games. It acts as a part of a discussion around the concept of “Juiciness”, by attempting to define it both in theory and practice. The text describes a position on “Juiciness” in relation to experience design and “Experiential qualities”, and discusses the role of aesthetics in the context of feedback. The practical aspect of the project is aimed towards finding where “Juiciness” can enrich a design process and this is done through the design, development and analysis of a video game prototype. The project also takes a critical standpoint towards “Juiciness”, in order to question and expand on the current definitions of the concept.
1. Introduction

Video games in themselves are multi-sensory digital artifacts that can concern designers with everything from digital interfaces, through usability/playability, to more theoretical things such as aesthetics or experience. Video games have evolved greatly since their birth in the 1940s (Cohen, 2013), especially in recent years with the development of more powerful hardware, and have become a complex mixture of visual, audio and tactile experiences, and on rare occasions engage the smell sense as well (it is important to note that this project will concern itself mostly with the visual and hearing senses). As digital artifacts that encompass entities from many different technical, design and artistic disciplines, such as graphic design, animation, sound design, music production, and programming, video games inherit many of the qualities of artifacts or products of these disciplines. However video games have the added layer of interactivity, giving the opportunity to a user (or player) to experience these qualities.

The vast open plane of expression, provided by the mixed media artifacts that are video games, allows designers to literally create anything and give it life in the form of an interactive piece. Many video game designers have approached games as artworks and have concerned themselves less with the traditional conventions of video games, such as story or goals. I support this approach and believe that the open canvas that digital media provides to designers, should be considered as an opportunity to design video games (and any other interactive digital product for that matter) as something that fosters beauty and enjoyment in experience, as opposed to only as a set of usable tools and functions that lead to completion of tasks.

Feedback is one of the elements of video games that facilitate the experience of interaction. It is often discussed for its capabilities to provide continuous interaction patterns. Little has been said for its aesthetic importance to the perception of the game as a whole. I believe the sensory aesthetics of feedback can contribute greatly to shaping the player’s emotional reaction and overall experience, and that creating a more elaborated language around designing feedback would help designers to better grasp and therefore control the aesthetic capabilities of their designs. One possible way of doing this is by articulating the qualities of the design and see how they lead to changes in the experience.

A particular term regarding feedback – “Juiciness”, has been quoted on numerous occasions in the game design community. It has been the centerpiece of talks at conferences and has been mentioned in several books and articles. “Juiciness” has been used to describe specific aesthetic qualities feedback in video games, which has brought it to my interest. Still, on all occasions, “Juiciness” has been looked at and discussed from many different perspectives and a more unified description of it is missing.
This thesis project has two aims. First – to explore “Juiciness” from the perspective of “Experiential qualities”. As a concept in game design, it is relatively novel and I believe it has potential that is yet to be discussed. This project aims to help push the notion of “Juiciness” more towards an academic point of view, through it’s relation to more traditional theory of experience, and also clarify it’s meaning for designers.

Second - to try and design a video game prototype, based around the quality of “Juiciness”. This would provide not only a possibility to test out any methods or ideas, that have emerged in the process of this project, but also a first-hand practical example of the generated knowledge being put to use.

2. Contribution summary

The question this project is looking to answer is “How can identify “Juiciness” as a quality of feedback benefit a design process revolving around it?” This is done by exploring some more traditional understandings of the concepts I find valuable for the articulation of the quality of “Juiciness” – aesthetics and experience, and relating them to video game design. After defining the quality, I attempt to design a small game, based on the elaborated definition.

Approaching this project from both game design and interaction design perspectives could provide one possible way of integrating techniques and concepts, used in interaction design, to elaborate a process of designing a video game and thus enrich the methodological repertoire of video game designers. On the other hand I hope that this project can serve as one practical example of how games utilize more traditional notions of concepts used in interaction design and help inspire interaction designers and game designers alike to share and contribute methods and techniques between both fields. Another aim is to hopefully provide some practical help to aspiring developers (in the form of examples, designs and code), interested in expanding their knowledge in understanding the techniques used in developing the explored aspects of games.

3. Theoretical framework

3.1. Emotion and beauty in design

Coming from a Graphic design background, I am a strong believer, that the aesthetic presentation of a product is not only vital for the product’s success on the market, but also strengthens the product’s capabilities of portraying its own meaning or usefulness to the user.

According to Donald Norman in his book “Emotional Design: Why we love or hate everyday things” (2004), every object can have somewhat of a personal component, that is not necessarily dependent on it’s original design. A person’s
most valued possessions might not necessarily look like something of importance to someone else, but they still represent something more than simple materialistic ownership. A certain object can hold some kind of meaning for a particular person – an individual connection, that allows the person to, in a way, identify themselves with this object.

This personal connection is a result of perception, recognition and understanding, some times called meaning generation. The origin of the entire process, occurs on a very base, subconscious level, which Norman calls “affect”. It entails our capabilities of quickly assessing situations: Is something dangerous or safe, irritant or comfortable, dull or interesting? This in turn leads to changes in our emotional reactions and behaviors in the given context. This view, originating from cognitive science, is relevant to design, as the final purpose of any design – to co-exist in a world surrounded by humans, and therefore be examined, experienced, used, admired and so forth, ultimately depends on the human's affective and emotional systems. Norman identifies three levels of the human brain, that function in co-relation to form what he dubs an "affection process" - the visceral level, the behavioral level and the reflective level. At the beginning of an experience, the first reactions occur at the visceral level - where our brain gathers a perception of the presented conditions through our senses. On behavioral level, reactions to this information are generated. The reflective level comes last, where we consciously rework and understand the gathered information. All three levels inform each other and describe emotional responses. We steer away from things that scare or endanger us, or we simply dislike, and move towards things that make us feel happy and we feel would positively affect our lives.

These three levels in the human brain correspond to three aspects of design, Norman argues: visceral – concerning appearances, behavioral – pleasure and effectiveness of use, and reflective – rationalization and intellectualization of a product. He adds that the three aspects are intertwined and concern both emotion and cognition and that a design cannot exist without all three. These aspects are inherent by the design’s sole existence. They are a part of an object as traits of its design, and emerge in the design itself as a result of a person's subjective experience. A design is considered good only if it is being assessed as such by the people who have some sort of either passive or active interaction with it. These interactions include both designing the object and experiencing it as a viewer or a user.

Although being a bit of a dry, almost strictly scientific analysis of how emotion occurs in us as a result of interacting with a particular object, or being in a particular situation, I believe it provides a strong point in arguing that the aesthetic presentation of a design, is just as important as considering its usability qualities, since this first hand “visceral” experience of a design creates the emotional response that would dictate the further relations with the product at hand. In fact, if we find a design beautiful and a somewhat "love at first sight" experience occurs, we might develop a personal, emotional attachment to it, even if it is not that special or even flawed from a usability perspective.
3.2. What is “aesthetics”?

Since this project strongly draws on a notion of aesthetics in a design, it is immensely important to clarify what exactly is meant by “aesthetics” in this context, since “aesthetics” as a term could encompass many different things.

A classical definition of aesthetics, that has been adopted in the field of design, particularly in the theories around designing for experience, is John Dewey’s aesthetic experience. This notion of aesthetics entails “a person's interaction with an expressive object, carried to the full”, that “yields an experience, a narrative which is unique to both the maker and the perceiver of the expressive object” (Forlizzi, 1997). In it’s purest form, the aesthetic experience occurs in the raw, comparable to animalistic, existence in the world, and is related with the heightened presence in the constant cycle of action and reaction within the surrounding environment. Dewey (1934) explains that “experience comes before analysis”, since the analysis itself entails a conscious reworking of information to produce knowledge based on a context or situation, and is related to the idea of task completion, which the notion of an aesthetic experience is not concerned with.

In interactive products, any aspect can be aesthetically charged and there are many interesting cases in which a more specific understanding of aesthetics occurs. Kirkpatrick (2009) keys the aesthetics of form and touch in game controllers. Based on the works of philosophers Walter Benjamin and Henri Focillon, Kirkpatrick notes an unconscious connection between form and intention, emerging through physical perceptions such as tactility. This translates from a “historically” charged association through the physical qualities of materials and form that define a game controller, to the embodied action of play. Kirkpatrick notes that in video games, this could be observed as the continuous replaying of a certain level of a (horror – Resident Evil in his example) video game, because of its explorative nature or its difficulty, which is performed by the player through physical interaction with the game’s input device, ranging from motion patterns (like with the Nintendo Wii or the Xbox Kinect for example) to the perceptual feel of a press of a button against the finger of the player, that concerns itself more with the matter of which the controller is composed and how that affects the player’s emotional state, than with anything else.

Another interesting place in digital artifacts where aesthetics have found followers, is the writing of a computer program, or coding in short. In “The Aesthetics of Generative Code”, Cox et al. (2001) compare code to poetry in both it’s form and function. As code is essentially a computer language representation of what we can fasten in human language, it is obvious that the same traits of artistic representation of human language can be translated to computer language. Cox et al. (2004) also mention, that code holds aesthetic traits in both being performed (written or otherwise utilized in an artistic way) and performing. The aesthetics of the autonomous performance of code, can be explored in great detail for example in the book “Generative Art” by Matt Pearson (2011), where the practice of writing code is utilized for the creation of computer generated
visual art. These are some examples of how aesthetic meaning can shift between
different design situations and intentions.

Tractinsky (2013) boils down the meaning of aesthetics to a very clear and
practical one. In his article “Visual Aesthetics in human-computer interaction and
interaction design”, he regards aesthetics as “… a fairly ordinary and common
sense as reflected in dictionary definitions such as “an artistically beautiful or
pleasing appearance” (The American Heritage Dictionary of the English
Language), or as “a pleasing appearance or effect: Beauty” (Merriam-Webster’s
Collegiate Dictionary). “(Tractinski, 2013) Not only does he describe aesthetics in
a very concrete way, but also frames a specific context – Human-computer
interaction, where the interest in aesthetics has seen an increase. He bases this
“common sense” understanding of aesthetics in traditional design principles,
which dictate a strong and solid design that not only aims to satisfy the utilitarian
needs of users, as in the perspective of the IT and HCI fields, but also covers the
psychological aspect of said design. Tarcinsky connects this psychological aspect
to the visually pleasing properties of interactive designs that relate to things like
self-expression, but also affect the practicality of a design in the satisfaction of
basic human needs. It is this understanding of aesthetics in regard to the
psychological aspects of a design, which I take as leading in this project.

3.3. “Shared” aesthetics in video games

Video games are a mixture of many different sensory components – not
just visual, but I believe that ideas, such as Tarcinsky’s design perspective, can be
universal for all sensory aspects of a video game, allowing an analysis on all of
them. Using aesthetics in such a concrete way will make it easier to define the
quality of “Juiciness” and hopefully help designers better grasp and utilize it in
their designs. In this section I will try to look at how aesthetics from different
design fields find place in video games in general.
Whether video games themselves are art or not (this does not include video game inspired art) can be debated (Pratt, 2010), but in their visual aesthetics, games certainly borrow from both fine and applied arts. If we take a look at the game "Crysis 3", for example, the visual representation of the game world is extremely expressive and immersive. The enjoyment of the visual representation of the virtual game world lies solely in its aesthetic beauty. These aesthetics have no functionality in the game itself – using higher or lower number of polygons to display models and characters, or the decision of whether to use complex real time lighting algorithms, will not change the rules of the game. Therefore it can be concluded that one of the reasons the immensely complex and realistic visuals are there, simply because they are nice to look at. But intense realism isn’t the only way a video game’s looks can go, in fact it is not even necessary for a video game to be realistic, in order to be considered beautiful or immersive, as discussed in the article “Video Game Graphics Don’t Matter. Visuals Do.” (Bernstein, 2013), where "Crysis 3" is compared to the game “Year Walk”. In Bernstein (2013)’s own words: "The very best game graphics happen when technologically sophisticated developers pursue an aesthetic vision and not a technological extreme."

On the other hand, there is the user interface or UI. although originally purely utilitarian in purpose (displaying amount of ammunition, score, health points, number of player lives and so on), the design of the UI draws on the ideas of Graphic design, where aesthetic beauty is used to augment and sometimes strengthen the capabilities of the design to convey information. The shapes and colors of the UI are consistent, which is generally typical for graphic design, but other elements like the weapons and the human icons (such is the case in the “Crysis 3” in-game UI) are based on the same design principles of icon design, as
the icons you would see in an airport or a bank for example. Another important aspect of graphic design, that takes a major role not only in the in-game UI (also referred to as HUD or head-up display), but in the entire interface of a video game, is text, or typography in graphic design. Typography handles everything from proper placement of text based on its purpose in relation to other graphical elements, to the illustrative composition of text or letters. In video games typography usually is concerned with text for readability, but this is not to say that text cannot be used for more intricate aesthetic purposes. Of course aesthetics of both fine and applied arts can be mixed together and can be seen at any point of a video game – elements in the UI can be there solely for aesthetic purposes and can hold no functionality what so ever; and products of graphic design can be seen in the virtual world of a video game in the form of posters or signs for example, that are there either to guide the player in the level exploration or story, or are simply there to create a better immersion in the experience.

Another dimension of aesthetics in video games is audio. It has been developed alongside all other aspects of a video game design, to the point where the production of sound and music for games is comparable to the production of sound and music for theater and movies. As Collins (2008) clarifies – games are not films (they still have the interactive layer), but video games include things called "cutscenes, full motion videos or non-interactive sequences", which Collins describes as "linear animated clips inside the game in which the player has no control or participation." There's a particular technique in modern day game design called "quick-time event", which is essentially a cutscene that prompts the player to press a specific button once in a while, after which the cutscene will continue, otherwise the player’s character usually perishes and the player has to try again. This boils down the interactivity to a bare minimum, bringing video games even closer to cinematic quality, hence heightening the importance of adequate sound and music design to support immersion. According to composer Bill Brown, music and sound can help steer the mood, introduce exotic locations, reinforce action or help develop themes, and the techniques used in composing music and designing sound in both film and games are similar (as cited by Collins, 2008).

Apart from their cinematic qualities, sound and music in video games can have other important roles. The entire genre of "rhythm games" is based around music for example. In this type of video games, players are required to match their input through visual queues to the music playing in the background in order to get better high-score (Dance Dance Revolution, 1998; Guitar Hero 2005). The music type doesn’t really matter for the rules of the game, as what is important is that the actions of the player are matched to the rhythm of the music, yet in this particular game genre, games that address specific musical genres such as Rock, Dance, Techno, Classical and so on, exist. The reason for this is that the type of music matters to the players. They might enjoy such a type of game a lot more, if the music they have to sync to is of their favorite genre, as opposed to something they might dislike.
An extreme in the direction of audio in video games is the game “Deep Sea” by Wraughk Audio Design. It is a game without visuals and the player has to navigate only by the soundscape of the game. Cases such as this game might even push the limits of the techniques used in design and prompt new research, that could later be translated to more common use of sound (and anything else for that matter) into other design or art fields.

The aesthetics flow in and out of video games, so to say. As video games are inspired by art, design or other interactive media, so is the opposite valid. As briefly mentioned earlier, visual art and design is often inspired by video games, such is the case of Bob Dob’s “Mario 13” as an example of an art painting, or the “Space Invaders” motives often used in fashion. Video game sound and music also inspire composers and musicians. Jonne Valtonen (also known as Purple Motion) started out as a composer of computer generated music in the so called “demo scene”, but currently writes video game music adaptations for classical orchestras.

Figure 4 The visual extremes of Guitar hero and Dance Dance Revolution vs. the non-visual extremes of Deep sea.

Figure 5 Bob Dob’s Mario 13, a space invaders bag and the orchestra at the Symphonic Fantasies Concert, where music from the games of game dev company Square Enix was played, arranged by Jonne Valtonen
These examples can give a brief overview of how techniques and conventions of different fields in art and design can be adopted to and sometimes inspired from the design of video games. This diversity allows us to emotionally react to products and artifacts in general, regardless of what media they are conveyed through.

3.4. Experience. From Interaction design to video games.

One of the central concerns of interaction designers is positive user experience, or creating conditions for good use (Löwgren, 2002). Designing for experience has less to do with the materialistic and more with the personal meaning of use (Hassenzahl, 2013). Hassenzahl argues that use of a particular product is not triggered by the need for the product itself, but rather emerges through more core human needs, such as the need for social contact or the need for self expression. He adds, that from a psychological perspective, the core needs are consistent for all humans, but since everyone acts out these needs in an individual way, this results in a different experience for everyone (Dam and Soegaard 2011). This implies that the user experience cannot be elaborately designed, but the design of a product can be shaped and pushed towards a desired experience (Löwgren, 2006). It is a sort of wicked problem (Buschanan 1992), that interaction designers have tackled by coming up with different design methods to design for experience.

As with aesthetics, theory and design methods from other fields can be utilized in video game design (Niedenthal 2008, as cited by Ehrdnal, 2012). Jenova Chen has concentrated on Csikszentmihalyi's concept of “flow experience” as the core of the design of his game “flOw”, which was a product of his master’s thesis. He utilizes the idea of flow to democratize and balance the experience of his game by constantly fluctuating through heightened and lowered challenge based on the player’s constantly evolving skills, without going into extremes. (Chen 2007).

Forlizzi (1997) takes a look at the subjectivity of use in different products and defines it in what she calls “rich” experiences or experiences that increase the personal value of a product in its use. These “rich” experiences emerge through the dissatisfaction of some users with what is provided to them in the form of market availability of products. She proposes as a method for tackling the problem of designing for both the common user and the user that is prone to want a more personalized design, the providing of the “raw materials for experience” (Forlizzi 1997). This I understand as creating a transparent design that holds its own experiential values, but is open enough to allow users to modify it to their own liking, without breaking its functionality. In video games, this idea takes form in the so called “modding” community. Modding, coming from modifying, is expressed in the customization of video games by changing characters or environments, or everything altogether – called “total conversions”. This has become so popular, that nowadays many companies release content creation tools, that allow users to create their own experiences in their favorite
games. Some of the most famous ones for example are Garry’s Mod (also know as G-mod) – a modification of the game Half-Life 2, that gives players complete access to all assets of the game, allowing them to make their own games, scenes or movies; or UDK – Unreal Development Kit – a tool set that allows the creation not only of content for the games from the Unreal series, but also modify the game’s engine and create entirely new games.

Figure 6 Half Life 2 and some scenes created in the game with Garry’s Mod

Figure 7 One of the (relatively old, but) most famous total conversion mods: the game Quake 3 and it’s mod Quake 3 Rally, that essentially turns the first person action game into a racing game

Figure 8 Unreal Tournament 3, UDK and Whizzle (developed from the ground up with UDK)
3.5. Experiential Qualities

Every product has some traits that describe it – materials, shape, color, purpose. Designing around them makes sense – we use materials that are durable, or recyclable; we design an ergonomic and comfortable shape; we choose colors that are inspired by the latest fashion; we design it in accordance with common needs of services. Yet, as Hassenzahl (2013) notes, it is not these elements that create the meaning of this product for its users. Asking users to say what their experience with a particular product is, will probably result in them telling a story of how they used it. It is this personal experience that makes products significant to users. Hassenzahl suggests the design of such experiences can be approached by going along three questions – Why?, When? and What? This would allow the designers to assess the human needs before concerning themselves with any other aspect of the product, but as the previously mentioned approaches, figuring out what the actual experience we want to design for is a bit abstract. It would have been nice to have the commodity of having such guidelines, like the aforementioned traits. This is where the notion of use qualities (Löwgren, 2002), also known as “experiential qualities”, come to place. Löwgren presents a set of key words so to say, that describe the qualities of a desirable experience, that one can design for. Many of them can even be directly related to aspects of video games, such as playability, immersion, engagement, anticipation to name a few. As Löwgren mentions, it is in fact possible that not all qualities are applicable to all situations, thus a further refinement of these qualities is demonstrated in their categorization by their overall shared meaning. In Löwgren’s own words, use qualities can be used to create a language around an experience, which could not only provide designers with guidelines when tackling a design, but also simplify communication between designers and stakeholders. (2002, p.2)

Another reason why I believe experiential qualities to be a good starting point for this project, is that they concern aesthetics. although from a more traditional, Dewian perspective (Löwgren, 2007), a connection of the qualities of use and the aesthetical beauty that leads to their importance in experience is close to what I am attempting with defining the quality of “Juiciness”. I find not only the idea of experiential qualities a “common sense” one (in the meaning in which Tractinsky(2013) refers to aesthetics), as its associative power of specific wording reminds me a lot to familiar design practices from my background, but the methodology of articulating those experiential qualities.

After taking a look at both aesthetics and experience from several different perspectives, it is obvious that both aesthetics and experience in all notions overlap to an extent. In this project by aesthetics I mean the visceral aesthetics that are associated with the primary perception; and by experience I mean the traditional aesthetic notion of an experience.
4. Methodology

4.1. Articulating Experiential Qualities

Since meaning (Hassenzahl, 2013) and qualities of experience (Löwgren, 2007) emerge in the use of a product, it would make sense to look for these experiential qualities in examples of use of a particular product. Through an educated overview and discussion of a particular artifact, one can bring useful insights to the community (Bardzell et al. 2010). This of course does not mean that one should disregard the community itself as a source of valuable information. Löwgren (2007) draws on an active community of designers, researchers and critiques, where the circulation of knowledge in the form of a debate over design ideas, concepts, techniques and experiences helps the refinement of possible contributions to the design field. I believe, that users should also have a voice in this discussion. The "life" of a design is in many cases dependent on its users and I find it important to explore where the users' part in this discussion could emerge and how does it influence the design process. The open communities around the game design field constantly influence it, as they do not only include commercial game developing giants (many of who's employers come from vastly different fields), but also independent game developers, video game researchers, and most importantly video game players (Burger-Helmchen, Cohendet 2011), so their opinions and expertise could be beneficial to a project such as this one.

A critical approach to analyzing a particular interactive design is flexible enough to allow a designer to chose their own scope and means of conveying their critique. As Bardzell (2009) notes, a critical look at a product might not necessarily bring a meaningful overview of the product as a whole. Depending on whether there is a specific problem a designer wishes to explore, or there is a more general design question that a designer can pursue for knowledge gains, the way the critique is developed and presented is dependend on subjective matters, such as audience and the designers own interests, skills and tendencies (Bardzell, 2009).

Löwgren (2007) utilizes such a critical approach in defining the quality of pliability (in short: the quality of information sets to feel like a responsive material, fostering exploration in the information itself (Löwgren,2002)), by taking a look at two pairs of software services (one for geographical information, and one for digital image management) and analyzing very concrete features in them. Both services of each pair could be perfectly functioning solutions, but Löwgren's perspective doesn't entail that. He is looking to answer the specific question of how the quality of pliability is emerging in the comparison of both designs, and therefore explores only the features where this particular quality can be observed. He explores the feel of panning, zooming and overall visual representation of the maps, as opposed to map truthfulness or coordinate positioning fidelity. He explores interface composition and design, as opposed to
image compression rates, image format support and so on.

I take inspiration in this type of critical approach for this project. The analysis of examples and related work will allow to illustrate ideas, concept and findings not only in greater depth, but also in a more understandable way. This I believe would also be a powerful way of conveying any generated knowledge.

4.2. Lo-Fi vs. Hi-Fi sketching

At a starting point all designs are blank canvases, where designers have full freedom to take any direction that they see fit. Following this analogy, the utilization of low fidelity (or Lo-Fi) prototypes can be useful to facilitating and supporting the early stages of a design. They can act as sketches - both two dimensional (such as a drawing on paper) and three dimensional (such as a maquette, made from different materials), and can serve as a tool for articulating both designer ideas and client/user requirements (Rudd et al. 1996). However, as Rudd et al. point out, Lo-Fi prototypes don’t give much of an impression of the use of a particular product. When the actual functionality is missing, there is little to no association of what the actual experience of using the product may be.

Löwgren (2012) suggests that in cases where the typical understanding of sketching won’t get very far, especially in cases where interaction over time needs to be tried out, it must be fastened in more hi-fi materials. From the perspective of the critical approach mentioned earlier - when we concern ourselves with a specific aspect of a design, it might simply be impossible to fasten it in the simplicity of lo-fi sketching. Since we are still talking about the process of idea generation on a relative early level of the design process, the word sketching is important to note here. As Löwgren mentions, although being the same in the way they are created as what we can call a “prototype”, these sketches should still be considered easy to discard, in order to facilitate a forward moving process and avoid getting stuck on specific ideas. Rudd et al. rightfully point out an important downfall of Hi-Fi prototyping - developing them takes time and specific skills, however with the availability of more "user-friendly" tools for prototyping allows to overcome such issues to a certain extent. I also draw on my experience and skills gathered from entering many 48- and 72-hour game development competitions, where the aim is to create a prototype that would convey its meaning, but does not have to be a fully-flushed final product. This mindset could be carried out throughout the prototyping stages, allowing room for constant iterations and adjustments.

It is important to note that although the use of Hi-Fi sketching, traditional sketches in the form of concept art will be a fundamental part of the process of idea generation, and the Hi-Fi sketches will be used for the testing stages of the project.
4.3. Research through design

This project takes the design process and the resulting design as a centerpiece for the knowledge generation. The discussions and generated knowledge oriented towards defining the quality of "Juiciness" are going to originate from the game prototype and its development and testing. Therefore this project can be viewed from a "research through design" perspective.

As Obrenovic (2011) states, design-based research is conducted in "messy, but entirely realistic situations". In the case of this project, this realistic situation would be introducing the prototype to an existing community of game players, developers and enthusiasts, which would bring back knowledge based on their experience from other situations and sources, rather than yield results from "sterile" and controlled variables.

Obrenovic also mentions, that this type of research cannot bring in universal frameworks and "recepies" for design. I try use this approach to give one clearer explanation of "Juiciness" in a particular design situation and bridge it to the more diffused notion of the concept. However, since there are many perspectives on what "Juiciness" is, a theoretical overview and discussion of the concept is also needed. Therefore the "research through design" perspective, more related to prototyping and testing, should be considered an addition to the theoretical discussion around the concept of "Juiciness".

4.4. Design approach

There are many approaches to designing digital artifacts and video games are no different. Just as in interaction design, the aim of designing video games is not the technology, but rather the experience (Salen, Zimmerman 2004). Similarly there is no one "right" method for designing a video game. Salen and Zimmerman (2004) argue for an iterative design process, incorporating both designing and experimenting and playing games in an iterative matter, which is how the prototyping and testing stages of this project are executed. Schell (2008) suggests looking at the design through different "lenses", that are essentially formal guidelines regarding particular aspects of a video games, allowing designers to look and analyze them closely, one by one, to dial their designs. This project is related to this method, as it is based around looking at video games from the lens of "Juiciness" (Schell. 2008). The only difference is, that if the scope of the guidelines, given in Schell's lenses is comparable to different camera lenses, in this project I try to look at "Juiciness" through a giant, space telescope lens.

Another approach, that I take inspiration from, is the so called "MDA", short for Mechanics-Dynamics-Aesthetics (Hunicke, LeBlanc and Zubek 2004). Hunicke et al. split what they call the "consumption" of a game into three general parts: Rules, System and Fun; and relate them to their corresponding counterparts in a video game: Mechanics, Dynamics and Aesthetics. In short:
mechanics are the brains behind data handling in the game, dynamics are the emerging behaviors of the mechanics over time, and aesthetics describe the "desirable emotional responses" of players when playing the game. According to Hunicke et al., designers approach the game in the sequence "mechanics->dynamics->aesthetics", but the players experience the game in the reverse sequence "aesthetics->dynamics->mechanics", which helps define an informative loop that allows designers to adjust mechanics, based on the changes in the aesthetic direction of the game that is being designed. This process feels like a logical direction that one might go into, when in the context of an explorative project. When combined with the idea of Hi-Fi sketching and the iterative testing of said experiments, prototypes and sketches, the resulting insights can lead to interesting and potentially relevant findings.

5. Feedback / Feedback systems

We have mentioned that "Juiciness" is something that emerges in experience and that it is connected to feedback, but in order to be able to properly articulate "juiciness" as a quality of feedback, we first need to take a look at what feedback is and how it is represented in video games.

The dictionary definition (oxforddictionaries.com) of feedback might be a bit confusing:

1. *information about reactions to a product, a person's performance of a task, etc. which is used as a basis for improvement.*
2. *the modification or control of a process or system by its results or effects, for example in a biochemical pathway or behavioural response.* [...]
3. *the return of a fraction of the output signal from an amplifier, microphone, or other device to the input of the same device; sound distortion produced by this.*

Only one word, but three rather different definitions... They are all true, and describe situations in which feedback is apparent, but are vague on what feedback itself is. To make this a bit clearer, we can start by looking at a definition of what a feedback system is, after which we can look for some examples that can illustrate better the dictionary definition of feedback.

A clear enough phrasing of a feedback system can be seen in Campbell Harvey's "Hypertextual Finance Glossary" (2011):

An equation where the output becomes the input in the next iteration. [...] This is also known as a feedback loop (http://www.thefreedictionary.com).

The difference between the three descriptions of feedback are that the first one entails an open feedback system, the second one is more descriptive of
a closed, autonomous feedback system, and the third one describes an automated process. A widespread example of the first case is often seen on websites. For example when a website provides some sort of public service, usually there are some means of letting the users provide feedback information to the developers, in the form of complaints, critiques or suggestions. This feedback is then utilized in the further development of the website and service provided.

In the case of the second description, finding a clear example of feedback in a biochemical pathway might be impossible, but a good example of feedback as a behavioral response is of emotion as feedback: "A person performs a behavior that causes distress to a friend. The person therefore feels guilty afterwards. The guilt prompts the person to consider what he or she did wrong and how to avoid similar outcomes in the future. The next time a comparable situation arises, there may be a brief twinge of guilty affect that helps the person choose a course of action that will not bring distress to friends (and more guilt to the self)." (Baumeister et. al 2007, p.172-173). In this example the feedback functions in a closed system, where the person consciously acknowledges the generated information and utilizes it to adjust further behavior.

The third description is quite illustrative on its own. Simply imagine holding a guitar right in front of an amplifier with the volume set very high – the noise from the amplifier gets picked up by the guitars pickups and the created signal runs through the chain again until it reaches the speaker, where the next iteration begins.

So if the descriptions that have been just explored concern feedback systems as a whole, then feedback itself could be considered the information that circles through these systems and allows all involved actors to be informed and react in accordance.

### 6. Feedback in games

As mentioned before, interactive artifacts can be defined by the user’s experience in the artifact’s use. However, as Schell (2008) notes, experiences without feedback can be confusing and frustrating to the users. Not knowing whether actions have any effect on what is happening, can lead to undesirable emotional responses, such as dissatisfaction, discouragement, annoyance and so forth. Therefore it is safe to say that feedback is vital to at least support

![Figure 9 A simple feedback system](image-url)

- 20 -
continuous use in order to ensure, that the user has a chance to experience the features of said artifact. In video games, feedback plays the role of informing the player of how the game is reacting to the player’s actions, and this can also be expressed as a feedback system.

The feedback systems in video games can be simple, such as the example that Schell (2008) gives with the basketball hoop net, where the net itself is not vital to the rules of the game, but the basketball player and even the public watching the game can see from a distance whether there was a score or not. An analogy of such a straightforward feedback system could be the in-game interface of a video game of the fighting genre, such as Street Fighter 4 for example: The life bars on top of the screen represent both the player’s and the opponent’s health. The circle icons under the bar represent how many rounds each fighter has won. The counter in the middle shows how much time is left until the end of the round. All of the above information does not affect the rules of the game, but help keep track of the player’s performance.

Another example of a simple feedback system in a more complex interface is what Sweetster and Wyeth (2005) mention when they discuss the game world (including the interface) of Warcraft 3: The interface informs the player of goals and resources, gives tips and other information such as player location and so on. The information shown is a direct representation of, and directly affected by, the player’s actions within the game world, but the information itself does not affect the rules of the game. Instead it allows the player to make informed decisions based on judging their own actions.
This kind of direct formative feedback can also occur outside the understanding of an “interface” as a compilation of navigation and information tools. Feedback that can inform the player’s actions can be presented within the virtual game world too. In Street Fighter 4, visual effects resembling flashes or sparks indicate whether a player’s attack was successful in impacting with the opponent or not.

Similarly in Warcraft 3, the difference between a live player unit and a dead one is clearly distinguishable, same goes for buildings, resources and so on. This allows the player to make notions such as “My units have suffered an attack. I need to build more units or send reinforcements.” or “My camp is in danger of being overtaken or I need to repair a certain building.” or “The resources at this location are close to depletion, I need to find more resources in order to expand my camp.”.

The representation of this type of feedback could be either realistic or abstract, and as mentioned earlier, it requires techniques from different design and art fields, such as font design and typography in order to create readable and well composed text in the interface; or graphic design, illustration and animation in order to find an aesthetically coherent visual representation of said feedback. As video games are multi-sensory experiences, the incorporation of other sensory elements is also used to help the players in noticing and understanding the feedback. Sound effects in Street Fighter 2, such as punching sounds and groans in pain help illustrate whether an attack was successful, when heightened action in the game is preventing the player from noticing the visual effects. The announcer in the game would proclaim “You win” or “You lose” at the end of every round to support the message of the displayed text. In Warcraft 3, sounds are incorporated into the interface for example to remind the player of tasks that need to be done; to let the player know if there is a battle going on off screen; or to let them know that the resources have been depleted.

Haptic feedback also can take a role in this type of system. A modern day gamepad can provide rumble (or vibration) functions that can reinforce things happening on screen and a more advanced version of this would be a steering wheel controller with what is called “force feedback”. It is used often in racing games such as Gran Turismo 5, where driving precision is key to gaining an advantage to the opponents. Gran Turismo 5 is a "close to simulation" racing
game, which means that it behaves close to reality when it comes to the physics laws of the game world. If a player drives too fast into a corner, the car might understeer; if a player drives on grass or oil slicks from crashes on the road, the car might slide out of control. Where vibration might indicate a bump or a crash, force feedback kicks in to illustrate the more complex simulated effects. This happens by essentially applying counter-force to the player’s input through the steering wheel in order to simulate the acting of the steering wheel as it would be in real life in these conditions. Still this information, even though representing very complex things, is relative to the previous notions of simple feedback systems – if the car slides, the player might release the gas and try to take control of the vehicle, but the physics laws of the game world will not change because of

Feedback systems in video games can become more complex when the idea of the player as a capable adaptive behavioral system is transferred to the game itself. This can be seen in the games Splinter Cell or Thief, which Hunicke et al. (2004) give as an example, when they talk about how a design changes, when the experiential aesthetics include a fantasy element, but more importantly when the challenge of the game “borders on submission”. What they mean by this, is that the mentioned games include self adjusting mechanics that allow enemies to react to player actions and make decisions based on the situation they are put in and therefore skyrocket the challenge and amount of skill required to play the game.

As opposed to games like Quake 2, where there are no such adaptive artificial intelligence systems and enemies charge blindly, in games like Splinter Cell and Thief enemies take cover and come up with tactics based on their odds. Another example of this is the game Descent 3, where when out numbered, enemies will run away, regroup and attack in bigger numbers; if the player uses weapons that have big impact zone of a single projectile, the enemies learn to create formations that would minimize the damage (Apreche, 2004). Suddenly feedback in the sense of “transmitted information of states” is no longer one-directional – the video game follows what is happening in the virtual world as close as the player is and adapts to the different situations that occur. The
player’s actions become feedback from the perspective of the video game.

That being said, in both simple and complex systems, feedback itself plays the same role – to inform the feedback system, so that the relevant information can be processed and launched forward for the next iteration. Those are just several examples of where feedback plays a role within the communication between game and player. Video games can have very immersive virtual worlds where the sensory perception is similar to the one in real world. Things like day and night cycle make us be weary of the dangers of dark places, like in the wilderness survival game Don’t Starve; Changes in weather conditions allow us to adjust our acting in the world, like in racing games, such as the earlier mentioned Gran Turismo 5; etc. Feedback allows the communication between player and game as feedback systems, so that we as players can understand and act accordingly in any situation, instead of being confused and not knowing what to do, because something happened and we don’t know why.

7. “Juiciness”

7.1. Emotionally charged feedback

If feedback is everywhere throughout the player’s experience, then we can say that in some cases the feedback is the experience itself, or at least the experience is heavily underlined by the feedback. If we go back a bit to Baumeister et al.’s (2007) example of human psychology as a feedback system, and take a note that based on feedback we can have emotional reactions within ourselves, then we can also conclude that feedback is capable of fostering emotional experiences. This is where I believe the experiential qualities of feedback start to emerge. One such quality is the quality of “Juiciness”. In 2005, Gray et al. wrote an article in the online gaming magazine “Gamasutra”, called “How to prototype a game in 7 days”, which included a small paragraph right at the end called “Make it Juicy!”. This paragraph discussed a specific type of feedback, that Gray et al. called “Juiciness”. It would make a game feel “alive” and responsive to every input from the player. The game would have a great amount of feedback for minimal input, it would make the player feel powerful and in control, and it would let the player know how well they are performing, as it occurs on a per interaction basis (Grey et al. 2005). So in a nutshell, “Juiciness” is
the emotional imprint of a responsive game through abundant feedback. Considering where the term originates – in an article aimed at rapid game design and development, when the designers don’t have enough time to create other immersive game elements, such as an elaborate story for example – that’s is exactly what “Juiciness” is supposed to do: foster emotions in order to make the game more immersive. But isn’t this pretty much what feedback does already in general? There must be something else that distinguishes “juicy” feedback from “regular” feedback. Grey et al. give examples of juicy moments in games such as “bouncing through a room full of coins, blinging with satisfaction” in Super Mario Bros., or “enemies exploding and flinging blood to an almost unjustified extent” in Alien Hominid, however this doesn’t tell us much – they are clearly examples of great satisfactory and rewarding moments, but blinging sound effects and flying particles are representative of feedback in many other games, so what makes the feedback in these examples “juicy”?

Robin Hunicke in her 2009 talk at dConstruct discusses the “Juiciness” of the game Flower. Flower is a balanced experience, that has no pressure from time, no obvious goals, where “you just fly around unlocking stuff” (Hunicke, 2009). It is often described as “Zen” and even considered the starter of a “Zen” genre, defined as a “calm and collected experience” (Sterling, 2008). Hunicke says that the game is very responsive and the player doesn’t have to do almost anything, and that it is juicy “because it is only built to make you feel free” (Hunicke, 2009). Again in 2009, but at a different talk (Wildflowers: The UX of Game/Play), Hunicke keys down several keywords describing juicy feedback: Balanced, Tactile, Inviting, Continuous, Repeatable, Emergent, Coherent and Fresh. It is feedback that is happening always and the player can feel it and doesn’t have to do much to trigger it. It is also surprising and has always something new to bring. These keywords are useful to keep in mind during the design process, in order to keep a focus on what exactly do we want our feedback to do.

In a talk at GDC ‘12, Martin Jonasson and Petri Purho talk about “Juiciness” in a tight relation to its original definition in the aforementioned Gamasutra article. They were inspired for this talk when Purho was reviewing student games and was surprised that many of the games were feeling dry and not engaging – they were lacking “juice”. In their talk, Purho and Jonasson take it upon themselves to demonstrate methods for juicing-up video games, and aimed it at start-up game developers; however it is obvious that these techniques are applicable to anyone who wants to create more intriguing interaction in their games. Purho and Jonasson mention that “Juiciness” is often related to, but not
necessarily constrained to, the visible and audible. The process they demonstrate is based on an existing set of game mechanics – a simple game of "Breakout", and is defined by gradually adding visual effects, color, animations, sound effects and music, to eventually turn the overall look and feel of the game to a much more alive and responsive one.

At this point, we have a very strong definition of what juicy feedback might look (and sound) like, and we know how it is supposed to be represented and how it is supposed to behave as a part of the feedback system. However this still doesn't clarify how exactly those descriptions help design a specific experience. The first description entails continuity and presence of the feedback during the experience and the second description – the "tactile" representation of this feedback. A good starting point in attempting to tackle the question of how does juicy feedback shape experience, is to take in consideration the main purpose of an experiential quality – the description of a desired experience. In the case of "Juiciness", this experience is the combination of satisfaction and empowerment, which contributes to an overall positive experience. We can take a look at some examples and try to figure out which part of them is juicy and how this "Juiciness" leads to a specific experience.

7.2. “Juiciness” and visuals

Many video games allow the players to upgrade their equipment, get new items or trade in loot that they have earned during the game. This often happens through virtual shops or merchants within the game world. It is not a genre specific occurrence, but it is often present in games where the recognition of the player within the player's avatar in the game is rather strong, such as in role-playing games. Stores in games usually are there to serve their purpose and not much else – they allow the players to exchange the game's currency for items, weapons and upgrades, or sell their own to gain currency, that they can spend further on other items. They rarely hold the traits of having business with a real merchant – the players can see which items are better than other, but for example the experience of bargaining is rarely there – the prices are set and the player can choose whether to buy a product or not. And if it is there, it's represented by numbers, statistics and possibly written dialog, which takes away the feeling of bargaining with a real person.

The merchant shops in the game Fallout 3 are very thorough – they show every item the player and the shop own, which allows a clearer overview of the ongoing trade. The player can see how much money they have, information...
about every item, its price and its condition. The player knows exactly what is going on. Every trade shows immediately how the inventories of both parties change. These shops serve their purpose more than great. But rather than trading with a person, they feel like choosing items from a list that go to another list, while a number goes down. The face of the shop owner is blurred out and even if there was any emotion represented on their face – it wouldn’t be seen.

In the game Odin Sphere, the shops have similar features as the ones in Fallout 3. Items for both the shop and the player’s inventory are accessible. Every item has a set price, quantity and information. Navigating and interacting with the shop in both cases is also very similar. However the shop keep in Odin Sphere is visible at all times. He is gladly smiling while demonstrating the item the player has currently selected and when the player switches between items, something interesting happens. There is a small animation showing the shop keep frowning right before changing the item. This is a very subtle thing, but adds a great level of liveliness to the experience of trading with the merchant. The emotions drawn on the face of the character oscillate between what can be interpreted as “Yes, this is the best we've got and you will definitely be satisfied!” and “Hmm.. you don’t seem impressed, maybe this will satisfy your needs...”. This animation doesn’t actually change anything – the prices of the items are still set and the merchant will not refuse to trade with the player after constant switching between items. It does however affect the mood of navigating through the shop as a whole. The fact that the shops in the game appear only on places where no danger is ever present and the player does not have to stay alert, in combination with this mood results in the spending of a longer time “messing” with the shop keep, rather than actually buying anything from him. It lets the player take a break and enjoy a sort of micro-experience within the entirety of the game. Once the player accesses the shop, the reactions of the shop owner are an uninterrupted, consistent flow within the interaction pattern and are evoked by just choosing a different item with the up or down buttons of the gamepad.

Figure 17 The Fallout 3 “list” shop in comparison to the Odin Sphere emotional item merchant
Another example of “Juiciness” from the perspective of visuals is the way fruits get sliced in the game Fruit Ninja. The game’s aim is to slice fruit with a sword as a ninja in training, and the entire action is performed by the player through a simple swipe on the screen of the device. However what happens on screen turns the player’s finger into the sharpest sword in the world, even if there is not the slightest hint at a visual representation of a real sword. The game takes advantage of what Jesse Schell (2006) calls “second-order motion”. He coins the term when discussing “Juiciness” and attributes it to elements that move on the screen in response to a movement that the player has made – which would then be considered the “first-order motion”. The movement of the player’s finger on the screen in Fruit Ninja is represented by a trail that demonstrates exactly where the player has swiped – this is the first-order motion already taking a representation within the game. The sliced fruit is always split in two perfect halves which fly in separate ways, depending on the angle in which the player sliced them – this is the second-order motion that reacts in an indiscernible fashion to the player’s interaction. A bouquet of graphical elements representing fruit juice and particles also appear – a splash on the wall that demonstrates where the fruit was sliced on the screen; a splash that shows in which direction the fruit was sliced, bringing another level of connection between first-order and second-order motions; juice particles that fly around when the fruit is sliced, adding to the feeling of slicing an actual juicy fruit, rather than a set of polygons with a texture. The combination of these elements creates a very small joyful “parade” of feedback that, when the gameplay escalates and more fruit starts jumping on the screen, simply creates the awesome feeling of making a fruit salad with a ninja sword.

Another example of second-order motion can be seen in the game Super Stardust Delta. The game itself gives great quantities of feedback, emerging from everywhere and adding to an overall very “juicy” feeling. What intrigues me the most from the game is the “Fire” weapon. When shot it creates a sort of whip, that is constantly shooting – there are no interruptions like with regular bullets in shooter games for example. although it not being effective for all enemies (IGN SSD wiki guide, 2012), it feels extremely powerful. Its consistency gives, first off – the feel of being able to handle enemies before they come too close to the player, and second – by moving around, the player can create a whipping motion that is not only very spectacular to look at, but makes eliminating enemies a lot
more fun and satisfying. This example is a great demonstration of how through second-order motion, "Juiciness" can be tightly integrated into the mechanics.

7.3. “Juiciness” and sound

The audio design of games can be quite complex, as mentioned earlier. Some games use dynamic, orchestrated sound tracks to help articulate the experience (such as action-adventure games like Uncharted 3, 2012 or Tomb Raider, 2013), other skip the musical score altogether for the same reason (Good Morning, Commander, 2013). Music however (even if dynamically fitting to the present situation) is part of the underlying background and affects the experience in a rather unconscious way. Sound effects on the other hand are usually directed at the player, as their purpose is to indicate whether something has happened or not. They are the feedback that allows players to orient themselves in the game world through the sense of hearing. Since “Juiciness” regards feedback as something shaping experience in a holistic way, it’s not a surprise, that some sound effects in a game can be juicy.

For example in the game Fruit Ninja, when a fruit is sliced, the audio feedback that the player hears is actually a small symphony of different sounds that complement each other and work in cooperation to an extra layer of the visual feedback, described above. It starts off with the sound of the sword swinging, followed by the thump or squish of slicing the fruit (depending on what fruit it is), followed by the splash of the juice, and finishing off with the sounds of the juice drips hitting the floor. By the end of the entire ordeal, the particles representing the juice drips are long gone (possibly to avoid unwanted clutter on the screen), but the sound of them hitting the floor (even if it isn’t visible in the game at all) helps extend the experience to just the perfect length, helping to push even further away from the feeling of swiping a finger over a screen that displays some graphics and to the feeling of slicing an actual, juicy fruit.

Another case of juicy sound effects are the bubble collectables in the game "Little big Planet". In the game there are two kinds of bubbles - regular pick ups and prize bubbles. The sound experiences of picking up both collectables differentiates from the one in fruit ninja, described above, by its continuity. The multilayered sound (which can be described as a mixture of a popping, squishing, cracking and liquid sounds) happens at the same time as opposed to being sequenced. This literally juicy sound effect accompanying a set of visual effects and a cool looking score counter turn the mundane activity of collecting pickups for the sake of higher score to a very rewarding and fun experience in the collection of every separate pickup. Another way in which the juicy sounds in this
case differ in continuation from the ones in Fruit Ninja, is that when the player collects the regular pickup bubbles fast enough, the pitch of the popping sound becomes higher and higher. There is no indication that this gives combo-score or extra-score, but this added layer to the experience creates a flow from experiencing one pick up to another. It feels as though the player is no longer just collecting pickups, but something greater is happening at the same time. And the only thing the player has to do is walk through the bubbles.

In the game Zen Bound 2, the player simply has to wrap a wooden object with a rope as tightly as possible. With a seemingly simple and unengaging task, the game instead emphasizes on its atmosphere and the sound effects. The rope with which the player has to wrap the wooden object comes from the side of the screen as is in constant tension. When the player rotates the object there is a constant audio feedback – a mixture of rubbing and crunching sounds, and it creates the feeling of tension in the rope that no human strength can sustain. Yet the player can rotate the object, without it unwrapping itself, with a simple swipe of the finger (or a mouse drag). In a combination with the ambient soundscape of the game, this creates an integrated feeling of flow within the game, similar in my opinion to what Hunicke says about Flower – a simple feeling of enjoyment of just being in, and interacting with the game. This, I believe, is a great example of how juicy sound effects help integrate small experiences – like listening to the crunching of the rope against the wood, into greater experiences – like being able to wrap the rope as tight as the tension a ship rope can withstand, and ultimately contributing to the experience of the entire gaming session.

7.4. Emergence

By trying to analyze "Juiciness" in examples it becomes easier to understand the capabilities of feedback to shape experience. By utilizing the ability of feedback to convey information to our human senses, it seems possible to use feedback to trigger emotional responses. I believe “Juiciness” emerges as a connection between definitions, such as the ones Schell, Hunicke, Purho and Jonasson talk about – the common thing between them is the positive desired experience of empowerment and satisfaction. But since it is obvious that experience of interacting with an external entity cannot exist without an actual sensory trigger to it, we can now see how the definitions complement each other. The timed nature of animation, particle emission and particle life, sound duration, etc., can be attributed to a timed experience, hence satisfying properties like “continuity”, “balance”, “repeatability” and “emergence”. Colors, shapes, gimmicks, the audio content of sound effects and so on can contribute to properties like “freshness”, “inviting”, “coherence”. And the mere fact that feedback needs to be perceived somehow adds to its “tactility”. Of course it works the other way around as well – when any of these properties is applied to feedback, they will require some sort of representation, so that the feedback is perceivable, and this is where these “visceral” game elements come to play.
It is this detailed attention to how both of those “experiential” and “aesthetic” types of elements connect that, in my opinion, allows the deliberate design of a specific experience, that a designer might want to foster in their design. A positive emotional reaction can be triggered within “micro-experiences”, occurring through the entire gaming session, to contribute to a consistent and flowing experience. These “micro-experiences” can be as long as a couple of moments (the fruit slicing and bubble collecting, mentioned earlier), to much longer experiences, that share common aesthetics with cutscenes in games, such as the example Jesper Juul uses in his book “A casual revolution” - the game Peggle, where the so called “Fever mode” is supported by fireworks, rainbows and other visual and audio effects, that work in a sequenced matter, without the need for a user action to trigger each one of them. So in a sense the need for user input can be used to differentiate when one micro-experience stops and another one begins.

An interesting analogy to this can be something that actually doesn’t bring such positive emotion in video games – “game over” screens. In classic arcade cabinet games, such as “Cadillacs and Dinosaurs” for example, when the players loose all lives and health points, they are taken to the “game over” screen, where a counter (usually from 9 to 0) gives them a chance to insert a coin and continue their game. This counter is in this particular case accompanied by a simple animation of a character pointing a gun at the player, which, when the time is over, changes to a darker screen with blood splats on it and the words “game over”.

In the game “Fruit Ninja”, every once and again in-between the tossed fruit, a small bomb would appear that, when sliced, triggers the game over screen sequence. First – the bomb stays in the air with the swipe effect that crossed it, while the rest of the fruit goes away, so that it is clearly visible where the player made a mistake. Then light streaks start to emit from the bomb, similar to how enormous and extremely powerful explosions start in movies. Then the screen turns white for a brief moment and when the white screen fades away, “game over” is written. Then “retry” and “quit” buttons are showed, along with a character that gives some interesting facts about fruit.
In the first example the entire sequence that leads to the game over screen itself is somewhat linear. The player’s character in the game dies, the counter shows up and if the player doesn’t interrupt it, the game over screen is shown. In the second example all of the happenings are somehow connected and flow from one to another – the player makes a mistake and the game takes the time to show where the mistake was made, then it shows the player how powerful the bomb is with the little animation. Then the words “game over” are shown, but the sequence doesn’t stop with that. The final screen still gives the player some sort of a reward in the form of the interesting fact, and shows the player that the situation is not so bad, by giving them the option to retry the game. Of course from a commercial point of view, both game over screens have different purposes and are designed accordingly – the first one, to make the players want to spend more money in the arcade, while in the case of the second one, to keep players from feeling disappointed and keep them interested in the game. But if we take a step away from those external effectors and take a look at the experience of going through the “game over” screen sequence, there really isn’t anything special happening in the first case, while the second case sort of holds the player by the hand and even though they made a mistake, the game shows them some more nice graphics and powerful sounds and ultimately gives them a nice small reward in the end. Although arguably "positive and rewarding", these “game over” screen sequences are a good example of how shaping the properties of the given feedback in the context of the sequence itself helps shape the player’s experience of triggering and witnessing the sequence. I believe “Juiciness” is defined in what could be seen as separate units, which I like to call “micro-experiences”, or a combination of them, and that eventually it leads to the construction of the feedback or feedback sequences, ultimately shaping an experience.

![Image of the Fruit Ninja game over screen sequence](image)

*Figure 21 The Fruit Ninja game over screen sequence*
7.5. Conditions and scope

For an experiential quality to be defined there must be certain elements or parts of a digital artifact, in which the quality emerges. In general, these elements can describe different things about the design – how it looks, how it works “behind the curtains”, what ways of interaction are possible, etc., but from the perspective of experience, these elements can affect how a user ends up seeing and understanding the artifact. Therefore those elements can be decisive for whether or not the artifact will be used and most importantly – how it will be used. For the quality of “Juiciness” these elements are anything that can be considered feedback in a video game. Schell (2008) illustrates the importance of the effect of feedback on the perception of the video game with his example of the basketball net and traffic light button – feedback could mean the difference between being fully aware of your and the artifact’s state, and having no idea whatsoever of whether your actions have any kind of effect. Löwgren (2002) relates the concept of experiential qualities as a connection and clarification between different notions of the conditions for good use of a digital artifact. The qualities themselves define which conditions foster "good use" - designs that need to satisfy user needs rapidly and without issues, are defined by "Efficiency" and "Transparency"; designs who are intended to give word and choice to the users, have the quality of "Actability" and so forth.

In a few words, the quality of “Juiciness” defines conditions that foster a positive emotional response, a feeling of reward and satisfaction and an overall enjoyment of being within the game world. This might sound a little too broad, but it’s clear aim at feedback in particular makes it more concrete and easier to note. However, the conditions it describes are forming and resulting within the user – it is a subjective matter, as to whether or not a user will feel satisfied or rewarded – some might and some might not. This raises another question – What then is "good use"? As designers we can define the conditions in which the users will interact with our designs, but these conditions become “... for good use” only when the emotional reaction of the users is in consistence with our intentions. If we want our user to feel satisfied, but instead they feel something is lacking and are left disappointed, then the conditions we created do not dictate good use of our design. So in order to satisfy this subjectivity, the use of digital artifacts can be classified into genres. A person that has a specific understanding of what good use for them is, will end up using a digital product of a genre that entails qualities, describing a satisfactory set of conditions. For example, in the scope of video games, if a player wants to experience the thrill of being scared, they would play a horror game, because their understanding of good use in this particular context is anything that can satisfy their desire for this particular experience and a horror game could perhaps have the qualities that define the needed conditions.

Löwgren (2002) notes genres as a way of narrowing the scope and thus articulating even further where do experiential qualities emerge. "Juiciness" has been attributed to casual games, which in itself is not really a genre, but it
includes games from genres like “puzzle games”, “adventure games”, some “arcade games” and omits games of other genres such as “horror games” and “roleplaying games” for example. I however believe that the subjectivity of where the conditions of the quality of “Juiciness” become “… for good use”, is exactly what demonstrates just how flexible this quality is.

To keep the quality from becoming too broad and still make it somehow useful to designers, it’s scope is limited to what elements exactly it regards. Feedback exists in every game in some sort of form, and if “Juiciness” as a quality is defined by a feeling of satisfaction and enjoyment, then any genre of games can become “Juicy”, when we as designers manage, through feedback and it’s shaping, to create the conditions that would dictate “good use” for any players interested in the particular genre our game can be classified as.

7.7. Satisfaction through “Juiciness”

In video games, there are plenty of different conventions that could satisfy the genre oriented needs of players – adventure games can have good stories, puzzle games can have great mechanics, action games can have lots of challenge. This means, that the concept of “Juiciness” might not be needed after all, since there are already ways to make the players happy. However just because of it’s bigger span over genre, I believe “Juiciness” should not be considered a replacement for those existing conventions in game design. Instead, “Juiciness” should be taken as an addition to the tool set of designers and developers, who want to explore and push further the importance and value of feedback within their designs. I believe, that through the event-driven and timed nature of the feedback related “micro-experiences”, “Juiciness” can help create positive emotional responses on a smaller scope within the play-session, in a way separating its area of effect from other conventions. The feeling of satisfaction coming from “Juiciness” is one of simple enjoyment of the moment, that can be related to things ranging from personal achievement to pure awe and impression.

8. Game prototype

In this project I wanted to somehow follow a continued understanding of the general idea of “conditions for good use” discussed so far in regard to “Juiciness” - a generally positive emotion, triggered from feedback, however I wanted to challenge the idea of “Juiciness” being attributed to games commonly referred to as “casual” and see how it is applicable to a niche in a broader look over genre and meaning. In developing a playable game prototype, I also wanted to explore whether or not it is possible for “Juiciness” to dictate a design process, instead of it coming later in the design to shape things further. This being an explorative project to an extent, it was interesting to see if it is possible for the entire design to emerge around the idea of “Juicy” feedback and try and take a look just how far the power of the concept of “Juiciness” can span.
8.1. Design tools and limitations

The prototyping of this project is done using the software Unity3D. The program is oriented towards the development of interactive software and video games, and works as a project manager in which all assets of the design are gathered and the relations between them are built. It is very open and gives the opportunity for the development of any type of interactive application.

One of the main reasons for choosing this software over others is that not only the freeware “Indie” version has all core tools available, making the shaping of feedback in the design at hand possible from many different perspectives, but also this version supports web-based deployment of the prototype. This was an important feature, since the method for testing required an easy way to distribute the game on-line, and having the game play in a browser would make it a lot more accessible to people, since they won't have to download it to their computers.

There is a limitation of the software with the support for haptic feedback that, alongside the time constraints of the project, resulted in the concentration over audio and visual feedback. On the other hand introducing haptic feedback would have required every tester to have some sort of a controller device that supported vibration at least, in order to be able to assess any experience related to this type of feedback. It is impossible to expect this from everyone who is trying the game and it was in fact quite possible that most of the players will try the game out using their computer keyboard, which doesn't support haptic feedback. Therefore an effort to solve this limitation made no sense and could have introduced issues later on in the testing.

8.2. Testing

Traci Fullerton (2008) also talks about an iterative approach to designing, especially in regard to playtesting. A constant loop of trying out ideas and revising what has happened, pushes the design forward. The playtesting from Fullerton's perspective can be split into several parts – the first one starting with self-testing. This part, although seemingly obvious, is actually a great way of trying out initial ideas and doing rapid changes very early in the process. After this comes testing with what Fullerton calls "Confidants". Essentially these are people, who are close to the designer (friends or family) and are relatively easily accessible. They could also give some useful feedback to the designer in an earlier stages of the design, but the problem with both self-testing and testing with confidants is the high possibility of bias. The most useful way of testing is with "external" playtesters.

Gathering the data from a playtest can be done in many ways, as Fullerton describes. Being present at the tests, asking questions, having discussions, using feedback forms to get information from a distance, even implement tools in your game to gather the data you need for you and present it in a readable manner.
Those things however often require organization that is beyond the power of a single independent designer/developer. One might not have access to professional elaborate playtesting laboratories, as they are discussed by Niedenthal (2007), the gathering of suitable playtesters might take longer than needed, and the general organization of a playtesting workshop might be out of the scope of ones budget.

On the other hand, in an explorative project like this one, where the “specific agenda” revolves around something as elusive as emotion and experience, and the testing should occur in a rapid, iterative fashion, self-testing and playtesting with friends might work for what they are, but the effort in putting together a professional playtesting workshop might not be justified. Therefore I tend to go back to the idea of an active community, discussed earlier. Nowadays, when access to the Internet is the gateway to pretty much all information of any kind, virtual browser-based meeting places (such as different blogs or forums) for different communities are an often occurrence. Case in point – The Unity Community and TigForums. Both forums are live, thriving communities of both players and designers from all age groups and skills, which makes them invaluable sources of information regarding video games. Most importantly – both have “Feedback” sections, which in themselves foster the idea of mutual playtesting and general communal help.

The notes, spreadsheets and responses of all tests are included at the end of this report as attachments.

8.3. Experiments

A conversation around the idea of experience, "Juiciness" and games was needed, so in order to start one, I tried to develop a set of small experiments or “interactive sketches”. The main aim with them was to find a suitable starting point. The sketches were split in two parts – the first one had two sub-parts.

8.3.1. Sketch1 – the fire trail

I see the capability of a concept such as experiential qualities to fasten important design aspects into keywords as a sort of “key feature”. It has a row of beneficial purposes, such as having a common language to talk about the design, or allowing a more concentrated overview of important aspects of the design. I wanted to try and approach the first sketch with a method inspired by this – it was obviously possible to analyze and asses features of a design and wrap them with a key word, was it then possible to reverse the process – to come up with a key word and design around it instead?
The method I was trying out, was also influenced by the MDA approach. As it discussed earlier the designer’s perspective in the method and the player’s perspective are reversed (mechanics → dynamics → aesthetics and aesthetics → dynamics → mechanics, respectively). Since I wanted to try and design the sketch with experience in mind, I was interested in the player’s perspective, rather than the designer’s, at least when it came to this approach. This affected the way I came up with key words around which to design. I was trying to avoid coming up with verbs, as verbs define activity, rather relating to both dynamics and mechanics instead of aesthetics. Therefore I wanted to come up with nouns or adjectives describing the experience. It is of course debatable whether or not this actually affects the design process in any way, as from a linguistic and semantic point of view, it is rather simple to turn verbs into adjectives or nouns and still talk about the same thing (in this case - to flow, to float → flowing, floating → flowy, floaty and so on). This didn’t matter however. I had fulfilled my own criteria – I had key word around which I could start a design.

The sketch was visually “bare-bone” simple. Completely black background with some blocks simply standing in the game space. The player was represented by a trail with a fire texture on it that was visible once the player started to move. There was also a light emitter attached to the player object. The controlling scheme was simple – the player could move in all x, y and z axes and this was done with the left (for x and y) and right (for z) thumbsticks of a gamepad.

Since I wanted to represent the feel of floating, I made an analogy with being in space. The completely black background had both the purpose of creating the feeling of extremely large open spaces and to keep the visual design of the sketch away from any suggestive themes at the same time. This raised a problem though – when moving in large open spaces (much less spaces that have only one color) it is very hard to get the feeling of motion. There needs to be some sorts of close enough anchor points through which one could measure the distance passed. The blocks, suspended in space were there to serve both the purpose of said anchor points and to add a level of possible exploration. Another issue that needed a workaround was the fact that the player object was not visible at all in the start of the sketch. The fiery trail would appear only after the player starts moving and the light, emitted from the player object was not visible until the player got close to a wall. To at least show where the player is represented on the screen, I introduced the effect of gravity to the player object. This was supposed to make the trail be visible right from the start and add some sort of an entertaining challenge to keep the player from falling far away from the

Figure 22 The fiery trail, the box field and the controlling scheme of the first sketch
I decided to go for a gamepad as a controller, because I find gamepads to be somewhat of a definitive symbol for gaming. They have been the main way of controlling games ever since the birth of video games. I believe gamepads make the feeling of playing a game a lot more explicit in comparison to multipurpose input devices such as keyboards or touch screens. There is a reason why the icon for the gaming section of mobile devices for example is represented more often than not by a gamepad. Although introducing the possibility to control the sketches and ultimately the final game with a keyboard, the gamepad would remain the main input method for this project.

8.3.2. Sketch 1 testing

To test out this sketch I wanted to try and use learned techniques for documentation, especially video recording. I believed at the time that this method would allow me to in a sense relive the playtest session and give me the chance to deeper analyze what was going on. Even if this would not necessarily make it easier to decipher the emotions of the players, the combination of facial expressions, motions and happenings on the screen would somehow give me a chance to create logical connections and generate some meaning around them. To gain extra results, inspired by the methods for playtesting described by Fullerton (2008), I wanted to have a short discussion after the play session with each player and let them take a distanced look at what they experienced. I tested this version of the sketch with two players, who, however, were reluctant to be filmed. I had to adjust my documenting methods on the spot, so I decided to incorporate the discussion in the testing session itself and take notes, instead of having it in the end, as I wanted to somehow capture the experience during the playing of the game, instead of discussing it as an aftermath.

During the testing the players reacted to both the visuals and gameplay through different associations, regarding the “trail” used as a player character and the overall mood and playfulness of the sketch. Comments on the sketch as having "meditative" and “Zen”-like qualities demonstrated how the notion of an experience was forming while playing the game. However, the feeling of flying was associated with the lack of a visible ground, which was a design decision with a different intention, showing the effect of association and personal experience over the current perception of the game.

There were of course some issues that were discussed, such as the difficulty to see the player’s character when its stationary for example. I decided to address some of these issues in an update of the sketch and see how this might steer the discussion.
8.3.3. Sketch 1.1 – the ghost trail

I wanted to preserve this feeling of flying, but introduce an “explorative” quality as well and push further the idea of using such key-words to steer the design. Since in the first version of the sketch, the player could move in the z axis, the player’s starting point was in front of the box field and I expected the players to move to them and play around with them. Both players however quickly ran away from them, so I needed to make sure the boxes will be a part of any possible emerging interactive patterns. Especially since exploration in it self requires something to be explored and the only “environment” in the sketch were the boxes. I removed the possibility to move in the z axis altogether, simplifying the control scheme, and placed the point inside the box field, so that the collision between the player object and the boxes would not require the player deliberately finding and going into the field, but could rather happen by just floating around the boxes and bumping into them.

I also removed the effect of gravity, in order to try and amplify the feeling of simply floating in space. Instead, subtle gravity effect was applied to the particles, to emulate heavy smoke (such es the smoke from liquid nitrogen for example). The particles would also collide with the surface of the boxes, adding another layer of interactivity – I wanted to see if the players would notice this effect and play around with it. The light emitter was left as a part of the player object, so that when the player gets closer to a wall, the light would be visible.

To take care of the invisible player character, I left the fiery trail out and replaced it with a smoke particle system. The system would emit particles even if there was no movement, so it would generate a small cloud at the location of the player.

8.3.4. Sketch 1.1 testing

I tested this version of the sketch with two other players, and the changes seemed to have an effect on what they experienced. The responses this time, were around the identification of the character through it’s light source, which could only happen when close to a wall. The players found it a fun activity to just glide around the boxes and observe the character. The feeling of floating or flying however did not get much attention, which showed a kind of balance between the two “keywords” that in this sketch was tilted towards “explorative”.

When conducting the tests I was asking questions such as “What do you see?” and “What does this make you feel?”, and was expecting answers such as “this is nice” or “this feels good” or “this makes me happy” etc. I was relying on the fact that while asking and getting answers, I would see what is happening on

Figure 23 The ghostly smoke of the second version, moving around the box field
the screen and would then make sense of the information and ultimately figure out if it was a good or bad experience. This however turned out to be a hidden pitfall – it eventually left me confused with the answers I actually got. It seemed very hard to talk clearly about emotions and by getting these unexpected and mixed answers, I couldn’t possibly figure out what the testers were feeling while playing the sketches.

However, as Hassenzahl says (Dam, Soegaard 2013), people don’t feel good to talk about how they relate to a product, but like to tell stories of how they used said product. This contradicts the idea of trying to figure out the experience as it is happening, as opposed to talking about it at a later time, but as a thought, it helps understand how people talked about their experiences. Thus, the common language around experience was starting to take shape. I was still questioning how can I perceive or even measure positivity or negativity of the experience – I felt this was important as I aimed at leading the design to the quality of “Juiciness”, which implied designing towards a positive experience.

8.3.5. Sketch 2 – the lanterns

The second sketch was a means of observing how design alterations based on previous insights affect the experience.

I reintroduced the fiery trail, but in this case I replaced the fire texture with a flat white texture, that had transparency gradient to make the trail smoothly fade out. I kept the particle emitter, but removed the gravity and replaced the smoke with tiny sparkles to add a more “magical” feel. In order to make the light visible at all times, I added a halo, so that the general feel of a magical light flying around would be present at all times, not just when the player gets closer to a wall. This also was supposed to eliminate the problem with not knowing where the player is located on the screen both in motion and when staying on one spot.

Figure 24 The player “character” in the second sketch
The environment was changed to a set of five small islands that had lanterns on them. The 2D motion plane of the player was aligned with the lanterns themselves, while the lantern posts were sort of in the background. This made the environment a bit more diverse and the fact that it had a span outside the 2D plane was more obvious, which in turn I believed could make the environment a bit more interesting to be in. Every lantern was affected attached to it’s post by a hinge joint, allowing any collisions between the player and the lantern to make the lantern swing. Even though the lanterns were simple boxes, they emitted light and this light created shadows emulating the shadows made by a real lantern. Now hitting the lantern made these shadows move around and project over the entire surroundings, adding to a livelier environment. The lanterns also had a halo, so that the feeling of the light effects was consistent throughout the sketch. The five different lanterns had five different colors and when hitting them, the player (who starts as a white, colorless light) would absorb the color, making the light, trail and sparks of the player change color immediately. To further signify the collision, the lanterns would burst with “magic dust” - sparkle particles with the same color as the lantern.

The changes, introduced in this sketch were part “cosmetic”, meaning that the rules of the sketch were set from the previous versions, and the alterations were more to underline certain experiential aspects of the keywords, which I used as guides in the design. This could be considered the point where the notion of “Juiciness” took the place of the keywords and set itself as a centerpiece, around which the changes were made.
8.3.6. Sketch 2 – testing

With this sketch I wanted to try out how online distribution could work for the testing. One main downfall of this method is the lack of direct contact with the players, but there are many benefits to it as well. The first one - an open access to an already developed and thriving community around video game playing and development. This kind of method potentially allows more people to try out the game and to do it from the comfort of their home, which I believe allows them to be more freethinking and relaxed in their answers.

I used the posting capabilities of the forums, where I released the game, and an extra online form to gather the players' responses. The question I asked was simple: "If you liked (or disliked) something about the sketch, what was it and why?"

A question like this implies the discussion of an experience and also asks for both positive and negative reactions and the reason for them. When the players started talking about what they did and what they saw was happening in the game, I would be able to see whether or not they even consider the changes and when I compare their responses to the previous tests, I could see how the experience has been affected and what caused it.

Although not really higher in quantity, the feedback that I got was quite interesting. By answering the simple question for themselves, people could easily distinguish what they liked about the sketch and what they didn't like, and could talk about it. The responses talked about players making their own goals with what was in the game; they associated the player object with a "comet" and played with the lanterns and seemed to enjoy the effects of floating around and hitting the objects in the game's environment.

Overall the tests of both sketches proved both things that I wanted to try out to be possible to a satisfactory extent. It was obvious that the typical spiraling approach of starting with an initial idea, testing it out, introducing changes, testing again and so on, was capable of designing conditions that could lead to different experiences, both specific – such as "floaty" or "exploratory", and more general – the positive, satisfactory experience of "Juiciness". Figuring out how to relate to positive and negative experiences, and understanding how these experiences were formulated by the testers was vital, and both live testing and online based testing yielded good enough results that would allow the further progress of the design.

The testing and insights from the sketches generated a basic method (or rather provided detailing on the aforementioned spiral design method) on which I could rely for the following part of the project. It was time to take the gathered knowledge and put it into the development of a more complete game.
8.4. Design process

After the sketches and seeing whether or not designing around “qualities” or "keywords" and the testing and distributing methods work, I wanted to make a working prototype, that would have the feel of a game – have basic mechanics and objectives, after which I can try and apply the concept of "Juiciness" to the core game, and see how (if at all) it affects the player's experience.

8.4.1. Initial ideas and process start up

The idea of “Juiciness” as a set of feedback elements seems to be applicable to any situation, in the sense that it doesn’t require a specific framing, but rather the existence of feedback in the digital artifact, that can eventually be shaped into “Juicy units” or “micro-experiences” I mentioned earlier. Therefore I didn’t want to decide a particular genre in which I want to set the game, as I felt that it didn’t really matter as a starting point – I wanted to explore whether or not “Juiciness” can work in any game so to say, and instead just came up with four simple sets of mechanics that were more or less directions towards genres, which would get more defined later on in the process.

The four initial games were as follows:

- A game in which the player constantly moves in one direction, has to avoid obstacles and survive as long as possible in order to get score.
- A game where, the player has to navigate puzzle like levels, and is required to collect a certain amount of pickups to pass the level, while avoiding obstacles in the environment such as spikes.
- A game from first perspective, where the player races through an infinite randomly generated terrain
- A similar game to the previous one, but instead the terrain is made of suspended platforms and the player has to navigate automatic jumping to land on the platforms.

After sketching out the four ideas, the first two seemed to have a lot in common with the sketches from before, so after a bit of contemplation, I decided to go with the first one. It shared some aesthetics with the first sketches, so I thought it would be interesting to see how the decisions I made for the first sketches would be affected during the design process.
8.4.2. Development of the game prototype

I wanted to keep the game visually abstract, as I felt the process of players associating the visuals with different things was an important part of the experience and demonstrated how the subjectivity of experience can be put under one dome as the different associations emerged from the same visual and audio elements in the game. I thought a bit about the particular visual style of the game, but eventually decided to let the graphical design, including shapes or colors for example, emerge through the design process. That would eventually lead to keying in the audio design of the game as well. I started off by implementing core gameplay mechanics, so that I had a base with which I can work.

The main point of the game was racking a high score while surviving for as long as possible, so the first thing that came to mind was to make raising the score somehow more obvious or explicit. In many games this is done with the use of "pickups", objects that have no other purpose than just being collected for points. This is a technique used very often in side-scrolling games to give some sort of embodiment to the score in the game world. However I was wondering how I can have the interaction pattern minimized. The movement of the player was already limited only to the y axis, so the controls were brought down to only using the left thumbstick of the game pad (or up and down arrows of the keyboard), but I wanted to see if I could take it even further.

Instead of having the player chase the pickups, I thought of making the pickups go to the player, if they are close enough. This raised a problem – even if there are obstacles, generally the player can stay in one place and there is a good chance there won’t be any collision, but the pickups will still flow towards the player, rendering the game pointless, or at least making it boring extremely fast. It was important to me to keep the feel of playing a game in. I wanted to test out whether or not “Juiciness” can be applicable to all sorts of games, so the basic idea behind a “Zen"
game – no explicit goals, no time limitations and so forth, could be perceived as only one possible direction, in which the game could go. I wanted to keep the challenge to a certain level at least, so I decided to turn the obstacles from the original idea into enemies that would deliberately try to hurt the player’s in-game avatar, so that the player would have to fight for surviving, in order to rack higher score. To defend themselves, the players would have the capability to shoot, which situated the game in the “shooter” game genre. Shooter games are often considered harder in nature, as they demand a higher concentration of the senses, so I was happy with where the prototype was going, since it seemed like a good opportunity to test out how the idea of “Juiciness” would work in a game where higher player skill is required and sensory feedback is crucial.

In its first phases, the development process was mainly explorative in nature, meaning I was trying out different visual styles, drawing concept art, coming up with potential interesting things that could be done in the game, and how they could be turned into “juicy micro-experiences”. At one point it felt as if the game was going visually in a direction I didn't want it to go, so I decided to take a step back, simplify the visuals and instead concentrate on developing the “micro-experiences”. I came up with three parts of the game that I wanted to concentrate on.

**Shooting and pickups:**

Collecting the points was tightly connected to the shooting mechanic of the game. In order for the players to collect points, they needed to destroy an enemy, which would in turn “release” the pickups, which the players can collect for score. A technique based on this is sometimes used in “Shooter” games, where the pickups would get to the player on their own, instead of the player having to fly around and trying to collect them. This technique is used in a special type of shooter games, called “bullet hell shmups”, where there is an immense amount of enemies and enemy bullets on the screen and the difficulty level is very high. Then the pickups flow towards the player, because the player simply doesn’t have the capability or time to react. To me this was an interesting way of

![Figure 31 The prototype, before the visual refinement.](image1)

![Figure 32 Although beautiful looking as still images, the visually heavy feedback of "bullet hell shmups" makes the game incredibly distracting and difficult to navigate.](image2)
approaching the collection of pickups and wandered if this could be somehow designed with “Juiciness” in mind.

Instead of making the pickups flow towards the player for convenience’s sake, I wanted to use this technique to emphasize the feeling of collecting score. When not obscured by other objects as in the case of the aforementioned “bullet hell shmups”, the player would have the time to simply enjoy their bounty voluntarily round up and flow towards the player’s character. To further push the satisfactory effect of collecting the score, I decided to have lots of pickups explode from the enemies. This didn’t have to artificially bloat the score as it was easy to equalize the possible collected score from one enemy. The only difference was that ten pickups that give a hundred score each look and feel a lot more like getting a big reward, than having one object that gives a thousand score. In the first released version of the game, the pickups would come back to the ship on their own, without any extra required interaction – the player would shoot the enemy down, the pickups would explode, creating a cloud, and after a short while, they would float back to the player, creating a timed, closed circle of feedback, floating through the game world, contributing to the shaping of one concrete “juicy micro-experience”.

As an addition to this, there needed to be some way to display the current score, so I made a simple score counter, sitting at the top left corner of the screen. I wanted to make the counter a bit juicier as well and give it some properties that would make it more than just numbers. Every time new score was added, the score counter would actually count up to the current score instead of immediately showing the new score. It would also grow in size while counting, in order to demonstrate that something is happening. This created a timed effect in itself that became tightly integrated with the ending screen of the game, discussed a bit later.
Changing shooting modes:

During the conceptualization process, I came up with the idea to have different worlds, that the player could go to or switch somehow between. In the concept this was to be related to the score somehow, but it felt like it was going out of the hands of the player, and I wanted to make it possible for the players to control this event, instead of having to rely on longer survival and higher score to get to a new world. It is a typical convention in game design to have different worlds in different levels of the game, however in this prototype, the game would be continuous and having a sequenced, limited number of worlds, I thought, could eventually break the illusion, for example when they start repeating. I also wanted this switching to be more integrated within the game, I wanted it to mean something more than just changing the background. I decided to split the game in two colors – lime and magenta. There would be enemies, enemy bullets and player bullets in both colors, and one color could interact only with the same color. These were to be the two worlds and the player could switch between them at will. I arbitrarily added a third color (cyan/blue) that was to signify neutrality or player related elements, such as indicating the score and the color of the player ship’s particles when it explodes.

I wanted the switching between the shoot modes to be fluent and not feel like interrupting the game, however I also wanted it to be very indicative of the player’s action and obviously demonstrate that something has changed. When the player switched the shoot modes the screen would flash very briefly and the color would already be switched. I programmed the shooting to switch immediately, so that if the player kept pressing the fire button and switched the colors, there would be no interruption in the flow of bullets, reducing the possible moments of vulnerability. Since the graphic style was now very stylized and abstract, the background I kept gray, but going along my concepts, I wanted to have something in the center, that would be very indicative of the current state of the game, so I made two symbols, showing the color and shooting mode. These symbols would switch during the flash, so no
stutter in the change between them was visible, creating the feeling of some kind of continuation in the flow of the game. To add variety to the game, I made the magenta colored shoot mode go in 3 different directions (up, down and forward), instead of going only forward, like the lime colored shoot mode. This could trigger different strategies of engaging the enemies and had hoped it would present a chase for the players move around.

**Player death and game over screen:**

The last “micro-experience” I wanted to try and shape was what happens when the player dies in the game. I wanted to make the transition to the final screen as smooth as possible, so that there was some sort of a gradual slowdown instead of an abrupt stop, typically seen in other arcade shooters. When the player died, a giant explosion of particles, colored in the player-related color, would burst and the screen would slowly fade to white. The number showing the score would slide to the center of the screen and would continue counting the score until the actual result was reached. This was to keep the feeling of anticipation on going since the players couldn’t know how much score they actually accumulated until the counting was finished. Once it was done counting the rest of the text would fade in sequentially, leading the game to it’s final state. This “micro-experience” was to create a smoother cool-down after the play session. After the entire event was over, the player could simply press the “Fire” button and the game would restart. This is in contrast with the typical ending of scrolling shooters, which would either just show the text “game over” or stress the player with a limited-time possibility to continue. In the case of these shooters, often such abrupt demonstrations could cause negative feelings of frustration from failing the game. I wanted to avoid this and decided to not show the words “game over” at all, to remove the feeling of the game ending and instead just demonstrate a pause or a slowdown between the play sessions.

At this point the game had a continuous, randomly generated spawning of enemies, which made the feedback too overwhelming – it would have been impossible to pay attention to all the things happening on the screen, so I tried to balance this out by having static enemies (represented by different sized circles)
on one side of the screen, that would spawn the regular enemies (represented by spinning plus signs). They worked in the same way as the regular enemies – two different colors, matching the shoot modes of the player. The difference was that they would not move like the other enemies, but rather stay static on the x axis of the screen, and they would take more bullets to kill. After each set of the static enemies was killed, they would evolve by generating random patterns and with each iteration would grow bigger. They would also sway on their position, adding to their liveliness.

**Audio feedback:**

The way the game responded to the music was still incorporated in the game – different objects would flash and wobble, based on which track of the music they were synched to. This effect would gradually fade away through the builds of the game. Sound effects are the most common way of having audio feedback in a game, so I wanted to see if they would affect the design in anyway.

There were sound effects for collecting the pickups, the shots of the player, the shots of the enemies, the death of the player and the death of the enemies. The sound of collecting the pickups was stacking on itself, as there were lots of pickups going in at the same time, resulting in a continued flow of sounds, occurring at the end of the pickups collection micro-experience. It sounded like dropping lots of playing chips or dice into a bag.

The sound for the shooting was played on the shot of every bullet, which made it overlay itself as well. The difference between the two was that the sound of the pickups will happen on occasion, keeping fresh and more importantly – indicative of an occurring event, while the second one would happen as long as the fire button was pressed. This made the shooting sound become old and even annoying very quickly. To fix this, I made the sound very quiet, so that it’s almost unnoticeable. This way it blended with the background and didn’t attract too much unneeded attention, but there was no other sound happening, the player could still hear whether or not the sound of shooting is playing against the background music.

The audio, played when the player died was not supposed to represent an explosion. Instead I wanted it to underline the transitioning feel of the switch between the game screen and the game over screen. It reminded the dispersion of something and had long reverb and delay effects added to it to accentuate the timed feel of the transitioning effect.

In contrast to the other sounds, the sounds for the enemy shooting and enemy deaths were much more organic. The shooting sound resembled a popping sound, similar to the

![Figure 38 First released version of the prototype](image)
popping of a cork from a bottle. It indicated the separation of two objects. The enemy death sound was a mixture of layered squishing and popping sounds, and in combination with the popping shooting sound and the visual effects of colorful dispersing particles, the enemies started to feel a lot more like biological things, than just spheres and pluses.

8.4.3. Testing and initial comments

After implementing the ideas that I had, I needed to test the game prototype out. This would start the spiral-like process of constant iteration and updates, based on tests and insights from them. Because of the results that I got from the methods of testing the second sketch, I decided to go with online distributed versions of the prototype here as well, while still having an open possibility for testing the game in real life with the players. I decided to create posts in two different forums related with game design and gaming (TIGsource forums and Unity Community forums), and after that spread out the post in the common social network channels, such as Facebook for example. The forums themselves had sections, designated for receiving feedback on projects, so apart from the online form, I could receive answers directly in the topics as well as responses in the posts in the social networks.

The forum topics I wanted to approach as making an introduction to a workshop. There was a small description of the project, why I was working on it and what I was concentrating on. I also added a screenshot of the project, as it is common that forum users do not try out projects, that don’t have any visual demonstration of what is behind the download links. Since the game didn’t have any introduction screen, I made a small graphic, demonstrating the controls and general rules of the game. These would later on change based on the answers I had, but forum posts have the capability to be changed or edited, so refreshing the information according to the project was not an issue.

Initial responses started coming in very quickly and as I had hoped, people came up with all sorts of different ways to express their responses and used all available channels - some used the form, some posted on Facebook, some wrote in the forum topics and I even received one video review of the game. I was afraid of affecting people’s answers by asking too specific questions, so I hoped that keeping the question the same as before: “If you liked or disliked anything in the game, what was it and why?”, would give me an overview of the general experiences people had, and eventually I could assess how the juicy micro-experiences I implemented are performing as a part of those experiences. This lead to a colorful set of responses.

The first wave of comments contained some information about the visuals style and the audio feedback. Some people concentrated on discussing the audio feedback, noting that the shooting sound was unrecognizable. Other seemed to enjoy the explosion effects and general visual style of the game. It was interesting that one of the comments mentioned as enjoyable the way the player comes in
view after the game restarts. I didn’t purposefully design this effect - it was a byproduct of how the scene in the game was set and was left in as it didn’t hurt the gameplay in any way. It was a great demonstration of people noticing things and giving them meaning, that were not necessarily viewed as a specific design decision. I decided to leave this effect throughout.

A prominent aspect of the game that was discussed, was the UI element for the shoot mode. People found it a bit distracting, and hard to understand. One of the comments that was regarding the game as a whole mentioned that if the player tries "rapid shoot mode swap" the flashing of the screen creates a strobing effect that was very difficult to look at. This showed how tightly the shaping of juicy experiences can alter the way the game works – for good or bad. The interesting thing was that almost all initial comments had parts concerning the actual mechanics of the game. Things such as both shooting modes are not equal rendering one or the other useless for example. Another interesting thing that was mentioned, was that the way the enemies worked now was easily exploitable, creating opportunities to "milk" the score without ever dying, making the score loose its value. This also made the firing button pointless. If the pickups would come to the player on their own and the player had to destroy the enemies to make the pickups appear on screen, there was no reason to ever stop shooting.

These responses could have been the result of two things – either because of the openness of the question I gave, allowing people the freedom to regard anything they felt was affecting their experience; or the fact, that no matter how thorough the feedback was designed, if the game itself is not working properly, people’s attention might get attracted to where the game fails, rather to where the game works. It was obvious that the closer the game reached a certain genre, the more expectations of familiar mechanics will emerge. Creating the micro-experiences that steered the game to becoming a part of the "shoot 'em up" genre, might have been the reason for rendering some of the mechanics non-functional, or could have lead to overlooking vital mechanics for this particular genre.

8.4.4. Updates and further testing

I decided to update the game and see whether or not solving some of the mechanical problems would make the juicy "micro-experiences" more obvious. The major two changes were that the player now had to release the fire button to attract the pickups, equalizing this mechanic to the typical mechanic for this genre, mentioned earlier; and that the microbe enemies would slowly move forward until they went off screen, after which a new enemy would spawn on the screen. I also changed the question for the kind of responses I was looking for, narrowing it down to asking about the visual and audio feedback of the game.
The responses I got from people playing the updated version immediately stated that the game was a lot more challenging now and was playing much better than before. There were still questions about some mechanics, such as the movement of the player, but generally the responses regarding any of the juicy micro-experiences I had worked on, were focusing on the changing of the shoot modes. Even if there was no reason for using “rapid shoot mode swap” and therefore no risk of creating the strobing effect, people still found the flashing and the big symbol too distracting. Another part regarding the shoot mode swapping, was the trail of the player ship. One comment mentioned that the matched colors are enjoyable, however the trail itself might be a bit too distracting as well.

In a following update I resolved some of the requested changes in the way the game played: the player was no longer restricted to the y axis and could now move back and forward. The two shooting modes were equalized in power and both were made to shoot only forward, leaving only the importance of color; the plus sign enemies became smaller and were turned in to bullets for the microbe enemies – they couldn’t be destroyed anymore, but if the player had the matching color shoot mode selected, they didn’t hurt the player either; instead of moving slowly forward, the microbes would now stay for a bit and then move backwards away from the player, to leave room for the new enemies. Another important change was that now the game wasn’t endless anymore. Instead the players had to survive a wave of 20 enemies, and would then be taken to the ending screen, where they could see their score and rank. This reduced the chances of boredom and pushed the prototype even further to an actual working game, which I hoped would reflect on the responses I got.

Figure 39 Changes in the shooting sequence

Figure 40 Changes in the shooting mode switch sequence
I also wanted to update all three “micro-experiences” (even though the game over screen was rarely even mentioned), according to the feedback I got. It was important to see whether or not changes in them would even be noted as experience defining.

I added trails to the pickups and the enemy bullets, to accentuate their feeling of motion. In return, I removed the trail of the player ship that was considered distracting by some, leaving the light effect of the ship’s engine to signify which color is currently selected. This already started affecting the changing of the shoot modes. I removed the flashing of the screen and lowered the opacity of the symbol. Now when the player changed the shoot mode, the symbol would change with full opacity and gradually fade out to almost fully transparent. This way I didn’t have to sacrifice the big logo, as I felt it was an important part of the visual design of the game; the screen didn’t flash anymore reducing the confusion of what has happened; and the symbol wasn’t taking all the attention to itself. I also wanted to change up the game over screen and make it more dynamic. Instead of all texts fading in, I switched some of them to swipe in, simply to add variety.

After playing the final updated version of the game, there were clear responses to all three micro-experiences, that I focused on. People seemed to enjoy the effect of the pickups swooshing around and being attracted by the player, so it felt like the representation of this particular sequence didn’t need any further adjustment. The switching between the two shooting modes seemed to be much clearer to people now and the mechanic behind it was more comprehensible, however in a second video review, I noticed that the light effect from the engines of the player didn’t show up on the web version. This was a bug of the engine, rather than an overlooked issue, but it would require some sort of solution, leaving room for further exploring techniques for “juicing up” the experience. A comment on the ending screen’s visual design being relatively inconsistent with the rest of the design of the game, demonstrated to me that at this point of the design process, the leveling between the different amount of juice in the sequences perhaps made the sequences more obvious to players, pushing them to raise questions about their design and functionality.
9. Conclusions from the prototype

9.1. Evaluation of “Juiciness”

One can consider the evaluation of an experiential quality based on its scope. As mentioned earlier – a person will choose to use a particular digital artifact if it is capable of fulfilling the needs this user has. If the artifact has the conditions that dictate good use for the user, the design projects a quality that describes these conditions.

“Juiciness”, albeit a bit different in scope, can perhaps be evaluated in a similar way. The concept is about experience and positive emotions, so if a player shows some sort of a positive reaction to the feedback, then the game could be considered “Juicy”. However there’s an issue – games are not only made of feedback, even if feedback plays a big role. There are plenty of other elements in a game that can trigger positive emotional reactions in players, which makes the evaluation of how “Juicy” a game is a bit diffused, when based on pure observation of use.

I believe a discussion around the experience of playing the game can open up doorways to evaluating how feedback affects the player’s reactions and in comparison with the design’s intention, eventually lead to a way of measuring how “Juicy” the game is. This raises a question: Does it make sense to take the term “Juiciness” out of its context? The term itself is very abstract and it is obvious it might not make any sense for users, so including it in the discussion might suffer rather than benefit from it. There needs to be a certain language for the discussion that presents a sort of parallel dimension to the discussion that might occur around “Juiciness” by designers familiar with the concept. This language is discussed in the next section.

So “Juiciness” as a term and concept remains a language directed towards designers rather than users. From this “educated” designer’s perspective, there is another way of evaluating the elevation of a certain quality, based on the aforementioned notion of use. This is done by comparison of different products of the same genre. Löwgren (2007) uses this technique to articulate experiential qualities, and that comparison is justified in the situations of use, emerging from different designs aimed towards the similar functionality. It seems possible to articulate “Juiciness” in different designs by comparison as well. Since “Juiciness” emerges in elements of the design, which can be shared over games of both the same as well as different genres, it is possible to compare similar elements from different games and see how one affects experience in comparison to the other, as was with the examples of the merchant stores in “Fallout 3” and “Odin Sphere”.

However, since experience is a subjective occurrence, based on different levels of perception and skills for example, it is natural that one designer’s opinion on what is “Juicy” can differ from the opinion of someone else. It seems
that this might diminish the value of "Juiciness" as a quality, but I believe that this weakness of the concept is also its biggest strength. "Juiciness" becomes a term tightly connected within a particular design, turning from a vague description to a way of keeping a concentrated mind over what we want to achieve as designers. It helps illustrate how a particular element, namely the feedback, of our game is performing, by providing a language for discussion around it, and allows us to consciously design this element towards a specific understanding of "good use".

In this sense, the comparison between different games within the design process itself, even if subjective to the designer's perspective, can illustrate the thought process of "Juicing up" feedback, based on the designer's own perception of what "Juicy" is, helping to project better the ideas of the designer onto the design. This was my intention when I compared the different "micro-experiences" that I designed to similar events from other games.

9.2. The language of "Juiciness"

One of the main issues that I ran into during the design and testing of the prototype, which is directly connected to evaluating how "Juicy" a game is, was figuring out the language around "Juiciness". By adding my attempt to analyze and define "Juiciness" as a concept to the already existing definitions, I believe that there is enough variety in perspectives to create a "multidimensional image" of the concept and provide enough base for a common language between designers. However, there's one particular perspective that is so far not discussed in any way and that is the perspective of the players and users.

Expecting the players to regard the game as "Juicy" makes no sense, since as mentioned earlier the term is too abstract and we cannot expect players to know any, let alone all definitions of the concept. Instead it would make sense to talk about how the players experienced the game. But talking about experience had proven difficult right from the start, especially when I tried to have a discussion around emotional responses. The effect of "Juiciness" emerges within a positive emotional reaction to feedback, which is what I wanted to have the conversation around, however using this kind of language is simply impossible when having a conversation with users. Using sentencing such as "positive emotional reaction to feedback" can be confusing and right down scary to users, who do not know the implications and expectations these words are charged with. This could create possibilities of "trap doors" in the responses such as bias, obscurity, distraction and so on.

One of my main directions as to how and where to look for the discussion, is what Hassenzahl (2013) says about the users and their experience using a product. They often find it difficult to talk about the experience itself, but they like talking about situations of use. This is why I ended up relying on a more story oriented way of discussing the experience – take note of what associations the users made, what they liked to do in the game and how they reacted to the response of the game. This often involved some "reading between the lines" and
ultimately boiled the language I could reflect on down to very concrete wordings like “this is great”, “I like that”, “this becomes boring” and so forth. These wordings easily can be translated to a positive or negative experience, but still remain rather vague as to what the experience itself was and how exactly it triggered this emotional reaction. For example it is easy to hear something like “I like these particles” or “I like this collision effect”, even get to technicalities like color, shape, direction of movement, but it’s hard to hear things like “I like colliding with this because it makes me feel happy and that’s why I want to do it more”.

The question here is: Do we need a language that is more concrete than “I like that” or “I don’t like that”? This type of wording demonstrates an involvement of the user shaped by a long and prominent enough experience, for it to allow them to thereafter reflect on their initial emotional response, triggered by the events in the game. I believe that getting a positive or negative response from the users in the form of their basic appreciation or dislike of certain moments and events in the game is a good (if not complete) starting base for a language around not only juiciness, but experience in general, when it comes to the perspective of users. In combination with the designer’s intentions of said moments and events in the game, it becomes easier to see whether or not these intentions were reasonable and ultimately led to any shaping of experience.

9.3. A part of a whole

Another interesting thing that became obvious from the design process and testing of the prototype is how “Juiciness” was tightly connected with the other elements of the game. One of the most obvious signs of this was the reactions I got from testing the first version. The testers expressed opinions, largely concerned with the playability of the game. To me, this meant that even if the feedback in the game is intentionally charged with the quality of “Juiciness”, the overall experience of playing the game would be steered in a negative direction, if what is supposed to be the fundament of the design doesn’t work. This made the evaluation of “Juiciness” even harder, since the discussion simply didn’t regard anything other than the mechanical part of the game. I believe this was due to the implied expectations of users, triggered by the type of the game itself. Even if “Juiciness” is technically genre-free, the game still lies in a particular genre, dictated by the way it plays and this genre still has demands towards the design that cannot be overlooked.

Although it is true that “Juiciness” becomes more related to the designer’s self-expression and this presents a certain responsibility towards the design itself, the designer is also responsible of giving the design “life”. Unless a critical design piece, a game is designed to be played. Thus I felt as my responsibility not only towards the design, but to the players as well to make sure the game made sense in order to leave room for the player’s attention to reflect on the “Juicier” parts. From the prototype it became clear to me, that “Juiciness” cannot exist on its
own (just as games are not made only of feedback, as mentioned earlier). "Juiciness" dictates certain understanding of good use, but the conditions it creates for this understanding seem to be shared with the rest of the game's aspects. Therefore making a game that works in coherence with its implications, makes it possible for "Juiciness" to be more obvious in the design and to be assessed easier within the design process itself.

9.4. Summary

The entire process of sketching and designing around “Juiciness” has shaped my personal view on it, turning it from a “novelty”, discussed by several designers in the field of game design, to a very specific and concentrated tool for shaping and assessing experience in relation to feedback in games. Its subjectivity creates chances for a deeper discussion around it and opens up the possibility for justifying one’s design thought process, and it does this by providing a sort of common language shared between designers. The experience it is oriented towards is also subjective, since positive reactions can be triggered in many different ways and can mean many different things to the players, but the concept's sheer concentration towards feedback gives a clear direction to designers as to what aspects of the design can be altered to push it towards a desired experience. In this sense, "Juiciness" should not be considered as an ultimate leverage point of what a good design is. Instead it should be taken for what it is – a language around a thought process of designing with experience in mind.

10. A critical look

10.1. Can one really design experience through “Juiciness”?

Contrary to my initial belief, that “Juiciness" can be a reasonable language around feedback and experience in the design process of games, it has turned out to be a rather subjective notion. Even though the concept is originally a bit diffused, it served as a way to discuss the qualities of feedback in digital designs. However in the situations I found, where the term was used, the discussion occurred after the design was completed. The arbitrariness of the concept shows, when it is used within the design process itself.

The answer to the question of whether or not it is possible to use “Juiciness" as a dictating tool in the design process lies in the assessment of the level of "Juiciness" in the design. As discussed above, in this context, “Juiciness" becomes a subjective notion that can be assessed only from the perspective of the designer’s intentions. This means that when the concept is kept within this context, it is possible to use it as a driving force behind certain design decisions in regard to feedback. This of course includes taking in consideration the relations
of feedback with the entirety of the game as a combination of many different elements. When taken out of the context of the tight connection between the designer and their design, the concept of "Juiciness" becomes perhaps a bit too diffused through its subjectivity and variation in opinion, to be anything else than a ground for discussion in the aftermath of a design process.

10.2. Is “Juiciness” really novel?

Feedback has been a part of video games since the earliest days of their history. Games like “Asteroids” had sound effects that indicated different happenings in the game world, visual feedback like exploding asteroids and being separated in smaller parts (which reminds a lot of what is called “second-order motion” in the concept of “Juiciness”) and so on. These games were perceived as great and were very enjoyable to people. The feeling of seeing an asteroid explode in the game “Asteroids” could very well be a comparable experience to seeing the visually heavy explosions and effects of modern games such as “Alien Hominid”. Both situations make the users feel powerful and make them feel satisfied with their achievement of defeating an enemy.

In this sense, is “Juiciness” as an idea, really something new? Feedback itself and its capabilities and qualities is clearly not something that new neither to designers nor to the designs themselves. However I believe the evolution of video games as digital artifacts in all of their aspects perhaps dictates the need for evolution in the language around these aspects. The sensory representations of video games have become a lot more saturated and it seems that there are certain expectations around this, which have emerged in both designers and users. When being used to modern video games that are audio-visually very rich, games from several years ago might not look so appealing to us. Schell (2008) mentions that it is rare to hear that an interface is “Juicy”, however it is more common to regard interfaces as “Dry”. This I believe demonstrates where “Juiciness” plays a role as a novelty – it is not intended as a re-definition of feedback, but instead works as a possible contemporary way of leading a discussion around feedback. I believe the notion of “Juiciness” is constantly evolving along side the field of game design and development. Perhaps in several years what is considered "Juicy" today will be considered “Dry”, or maybe there will be a new more evolved term, that better describes the feedback of future games.

10.3. Experience or marketing?

The subjectivity that seems to define “Juiciness” as a tool within the design process, leads to the raising of a particular ethical question. What does “Juiciness” mean to the designer as means to convey their intentions towards the users?
"Juiciness" aims towards fostering a specific emotion while playing the game. There are many reasons why a designer might want to make emotion a part of their game, however David Freeman (2004) puts them in two very specific categories "Art and Money". In his own words "... game companies that don't make a profit aren't game companies for very long" (Freeman, 2004, p.1). So according to Freeman and his idea of "Emotioneering", from a commercial standpoint, marketing the emotional value of a video game could mean a lot of things - from "expanding the demographics" through getting "better press" to "gaining a competitive edge".

However because of the ambiguity of the term "Juiciness", it is hard to market a game as such. This leaves "Juiciness" and it’s powers to harness emotion, internal to the designer’s intentions, which means that the question of whether it is used for "Art" or "Money" is even more prominent. Since marketing the game as "Juicy" doesn't make sense, it is hard to say whether or not a game could sell better, because it’s "juicier" - technically that would be experienced by the users after they have bought the game. However a concept like "Juiciness", that is supposed to give conditions for players to not only have an emotional experience, but a positive emotional experience, can possibly lead to psychological states of addiction for example. This opens a lot of doors for exploitation of the design, such as what is often done in “free-to-play” social games – make the game free, but constantly introduce new, paid downloadable content. Some of these games are often referred to as “free-to-play, pay-to-win” games, where the "free" part would work as an open enough way to experience the game, but in order for the players to progress further, they must purchase the extra content. Considering that the entire idea behind the concept of "Juiciness" is to help make people enjoy playing a specific video game, we as designers have to ask ourselves whether we are using this concept as a way to portray creativity and beauty for the benefit of sheer enjoyment, or to try and lure players into a commercially charged trap.

11. Further work

11.1. Sub-qualities of “Juiciness”

In this project, I’ve tried to take a different perspective on the concept of "Juiciness" and explore how it could play a role in the designing of a game as opposed to simply being a discussion around already created games. However, I believe there is a lot more to “Juiciness” as the term could become more and more specified and clarified, especially as a design tool.

One of the interesting things that could be further developed comes from the similarity of "Juiciness" to "Experiential qualities" in its direction towards dictation of conditions for good use. However, qualities such as "Pliability" or "Transparency" for example are rather specific towards what these conditions
are, but with "Juiciness" it is simply stated that they should convey a positive emotional experience and what the conditions for this might be, is left to the designer and their ideas and intentions. It is very specific about its relation to feedback and what is feedback, than a flow of data, a flow of information? Since qualities such as the aforementioned two regard properties of information, conveyed to the users, it makes me wonder if it is possible to identify "Juiciness" in some of the already articulated "Experiential qualities" in interaction design. Or perhaps it is possible to find sub-qualities in "Juiciness" that would make the direction towards achieving a specific desired experience much clearer in regard to events and situations that the designer wants to portray.

11.2. Non-audio/visual feedback

In my exploration of the concept of "Juiciness" I concentrated on the audio/visual representation of feedback, due to time constraints and issues with the development tools. However feedback doesn't only exist in this form – as already discussed, feedback could be anything that our senses can capture. Taste and smell are senses that haven't really been explored in video games, with smell being used on extremely rare occasions and taste not being regarded at all, however the touch sense is something very often used in modern day video games. Haptic feedback in the form of vibration and force feedback has become a popular aspect of video game controllers initially with the creation of add-on vibration modules, attached to the game controllers (called "rumble packs") and nowadays simply integrated directly in the controllers themselves.

This feedback can amplify to an extent the experience of playing a game, however as an individual element, taken out of the context, it is always the same. Gamepads can vibrate with different frequency, but whether or not this is triggered by hitting a wall or collecting an important pickup makes no difference for the gamepad – it will vibrate all the same. Force feedback will try to push the controller in a specific direction, creating force on the player's actions, but whether or not this is triggered by driving a car over rough terrain or there is someone on screen deliberately pushing your controller against the direction of the player's movement makes no difference – it will create the same force.

So there is obviously a ground for exploration of haptic feedback, especially in regard to "Juiciness". How could this type of feedback be adjusted for specific situations? How could it be shaped to convey a coherent meaning along with the other aspects of the game in the given situation? Haptic feedback works on it's own in rare occasions and is often accompanied by visual or audio feedback, to ensure that the player knows why the gamepad is rumbling. Could "juicing up" the haptic feedback mean that it would be more powerful and make clearer sense on its own? And how could this be achieved? What about materials, textures and other properties that we could feel through our senses of touch? These questions could not only intensify the discussion around "Juiciness" and what it could mean, but also prompt for advancements in the technology used for haptic feedback not only in games but in all digital artifacts.
11.3. Extreme cases of games and “Juiciness”

The understanding of “Juiciness” that I used as a starting point for my project, regards the concept as something attributed to “Casual games”. To me this made no sense, since the concept regards an element of video games that is persistent throughout all types and genres of games. This is why I wanted to push the boundaries of this understanding and tried to explore it in the context of very sense and attention demanding games, such as scrolling shooter games. However, the exploration could be taken in the other direction as well.

There are genres and styles of games that use feedback simply to convey information in its most clear and simplified form, such as text based adventures for example. These games often play through a command line, where the user would type what they want to do and the response they get from the game is in text form, sometimes accompanied by pictures. The feedback in these games is limited to showing a clear sign that the player has entered a valid command and something in the game has happened. But it is still there and it could be an interesting experiment to see whether or not introducing the concept of “Juiciness” to this type of feedback would affect the experience in any way, and what exactly would the “juicy” feedback look like during and after its transformation.

Another interesting case could be games that have an embodied aspect to them, such as the game “Dance Dance Revolution” for example. It is a game where the player has to dance to the rhythm of the music in the game by matching symbols on the screen by pressing that are corresponding to symbols on the real dance floor of the game. Since this is an arcade game, its cabinet is made to attract attention with loud music, lots of light effects and flashy graphics. These elements of the external shell of the game could be used as a means of conveying feedback and it could be interesting to see where “Juiciness” could play a role in a situation where feedback literally invades the actual physical player space.

Exploring such extreme cases could drive forward the discussion and definition of what “Juiciness” is and what it could become, but this could also demonstrate how powerful it could be when used as a mind set in the design and continuous shaping of feedback and the experience around it.
Sources


http://www.interaction-design.org/encyclopedia/visual_aesthetics.html

**Talks and Interviews and the likes**


Other sources (films, games, art, websites)


Don’t Starve (2012-2013). Klei Entertainment


Gran Turismo Force Feedback steering wheel image from: http://gizmodo.com/


Resident Evil (1996). Capcom


Attachments

1. Links to sketch and game, tested online
   
   Sketch (requires Unity WebPlayer):
   
   https://dl.dropboxusercontent.com/u/39910157/sketch2_build/Sketch2%20build.html

   Game, online version (requires Unity WebPlayer):
   

   Game, Win32 version:
   
   https://dl.dropboxusercontent.com/u/39910157/biseibutsu/updated_version/Biseibutsu_Win32.rar

2. Notes from sketches (formatted):

   *names are swapped for confidentiality purposes

   **Sketch 1:**

   Claire - Used to play games when younger:
   
   - Where was the character?
   - Associates the fire trail with a dragon.
   - A feeling of flying, because there's no visible ground.
   - A feeling of floating through the night.
   - Feels really high above the ground.
   - Feels meditative.
   - Associations with lights/lightshow
   - Moved away from box field and quickly forgot about it.
   - Calming effect, focus towards the center of the screen, where the character is.
   - More about moving around in the space than exploring per say.

   Sawyer – A casual gamer:
   
   - Difficult to navigate.
   - Abstract space.
- No clear sense between falling and floating.
- No sense of the direction of movement.
- Calming and soothing effect.
- Pace and acceleration.
- Drawing shapes with the trail.
- The character feels like a trail or a friendly object following the player.
- It feels alive, but detached from the player.
- Doesn’t project himself in the character, but rather with the screen-space.
- Feels separated as a player from the game world.
- Sketch becomes playful when getting used to it.
- Association with a flame on a stick.

**Sketch 1.1:**
Both testers tried the first version of the sketch as well.

**Libby** – game designer and educator:
- Associates the character with a ghost.
- Harder to see when ghost in comparison with fire trail.
- Looks for a plane so she can see the light, emitted from the player, because otherwise it’s impossible.
- Defines herself through the character by using the environment.

**Jack** – game design enthusiast and programmer:
* about sketch 1:
- Doesn’t feel like he hast immediate control.
- Explores environment and sees that the character is glowing.
- Notes an exploratory feel to the sketch.
- Controls could be a bit tighter.
- Explores, tries to make patterns with the trail and interact with the box field.
- Finds touching the walls of the boxes fun.
- Tried to write his name with the trail.
- Associates it with playing with light and long time exposure photography.
*about sketch 1.1:
- No sharp point (head) of the player character.
- Associates the character with a ghostly substance.
- Finds it harder to see where he is in the game world.
- Feels like the particles are an after-effect of something that is missing.
- Associates the cloud particles as patterns in the sky/skywriting.
- Felt like a top-down view of the world, instead of side view.

4. Spreadsheet from testing sketch 2:

<table>
<thead>
<tr>
<th>Timestamp</th>
<th>If you liked (or disliked) something while playing around with the sketch what was it and why?</th>
</tr>
</thead>
<tbody>
<tr>
<td>4/5/2013 13:40:06</td>
<td>I liked being a beam of sparkling light! Looks very nice too. It felt a bit lonely though in this enormous dark space. So I tried to go as far as I can go down, but then I gave up and came back to the little planet. Because there were no rules or goals I tried to play around and make my own - eg. bumping in all moving bricks or hiding in them, or trying to hit the brick from a particular angle. Watching the beautiful particle effect is definitely very rewarding and playful, however you get bored pretty fast. Makes me think about Tamagotchi for some reason, similar like you take it out of the pockets to feed your pet or clean after it, I went back to the browser to bump my beam of light into things. It felt a bit annoying that the beam of light didn't react fast enough to my button presses. So when it was going quite fast, I couldn't make a quick turn and bump into anything, since it reacted so slow. Overall I think you can really develop it and make a cool game out of it! Having a beautiful visual behaviour is rewarding and if you introduce some game rules or goals it will be very interesting! I don't know if it was at least a little bit helpful for you, but I wouldn't totally like to know about your progress and try the next version! Sveta</td>
</tr>
<tr>
<td>4/6/2013 13:24:36</td>
<td>I liked the feel of the collision.</td>
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</table>
| 4/7/2013 9:44:57 | I really liked the hitting effect of the lamps. The control of the comet (as I call it) is a bit tricky since it is not as responsive to the user control; it takes time to steer it. Yet, I guess that is the part of the challenge. After some warm-up with the game physics, I started thinking on what might be the challenge in the game. Since, I could not see any apparent challenge I invented one: I tried to hit all of the lamps in a at once, without making any cycles with the comet. Yet, that proved hard to do since when the comet hits a lamp it deviates from my intended path. I still managed to hit 4 of them in a row, and thought it would e even nicer if it gave some "combo" feedback when
hitting the lamps in a row.

I also wonder how the machanics might work with different input in handheld devices such as tilting the screen or attracting the comet with fingertouch from a distance, like a magnet.

5. Spreadsheet from testing the game prototype:

*The answers are set by date, starting from answering the broader question, and narrowing down towards answering the final specific question as listed in the spreadsheet.

<table>
<thead>
<tr>
<th>Timestamp</th>
<th>How does the visual and audio feedback in the game affect your experience?</th>
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<tbody>
<tr>
<td>4/19/2013 9:10:02</td>
<td>Change the shooting sound if you can, other than that the game is great all around. The music reminds me of Street Fighter 3rd Strike :)</td>
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<tr>
<td>4/19/2013 22:18:11</td>
<td>hey that is a nice little game=} i have some comments though. on the topic of juiciness - i like the animation, and the explosion both look nicely done. and also when you die, the way you jump out back to the screen is kind of nice too! and the way everything pulsates with the music, makes it a bit meditative even. however, maybe it would be nice to connect the whole game with one concept tighter. if the bad guys are microorganisms, why i am playing with the spaceship? could the particles effect also relate to microorganisms theme? the huge = sign is a bit overwhelming. it took me a while to understand what does it mean, and it quite unnecessarily dominates the whole screen. the second shooting mode wins over the first one and makes it even unnecessary. could it be that music is a part of the game? maybe you could have several music tracks, so people can switch between them. maybe even your juiciness behaviour could depend on the music you're playing? it could make the player explore more. good luck! sveta</td>
</tr>
<tr>
<td>4/20/2013 13:49:36</td>
<td>Sound is great. Can visuals be more &quot;flashy&quot;? I mean shooting at coloured balls could get a little boring. Any way - killing two differnt coloured balls makes it a little confusing for me, but I guess the game is aimed at a more experienced players of &quot;shooting&quot; games. Overall - nice work!</td>
</tr>
<tr>
<td>4/20/2013 14:27:05</td>
<td>I have enjoyed playing and it has a nice and generally clean visual style, though I feel picky about certain aspects: It was good to have a large visual of what weapon was being shot, though the transition needs to be less flashy and more seamless. I think with a large image like that it is noticeable enough without fading the screen lighter. I did not like the idea of not being able to move far back to the edge of the screen as the microbes went passed. It felt restricting that I could only move up</td>
</tr>
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- 70 -
and down (even that had a restriction) without any reason as to why it’s just up and down. Perhaps this is because of my previous experience of playing R-Type which focuses a lot on avoiding obstacles and collecting power-ups to evolve the ship.

I did not relate any of the microbes passing by with their evolved forms spawning after. I do not know, maybe there’s an indication missing to show that a certain microbe actually evolved or it’s the same structure in some way. Maybe them passing by the ship and leaving the screen creates the illusion of them not coming back?

It made more sense to only use the spread shot, the direct shot means I have to dodge the plus signs they kept shooting which means less shooting time. Since the pickups get attracted to the ship the spread shot is good enough for a whole playthrough. I did not feel the difference in damage between having a direct shot and having spread shots either.

4/21/2013 14:19:38 Well, I have played the game for more than an hour and found it quite immersive and captivating. It is very interesting that you can get points only when you are standing still and not shooting, which is the main innovation I guess. I really liked that aspect of the game mechanic. The way the points spread out and then get aligned is pleasing both as a game mechanic and visually.

I have played up to 85,900 points and from my experience so far, it is a game that is easy to survive but harder to get points. I always died of greed in the game, when trying to get the last bits of points. Otherwise it is very easy to survive and you can just retreat to the upper or lower edges and the very predictable spawning of attackers creates some boring waiting intervals.

One arguable design decision for me is switching between two shooting modes that are effective to attack different kind of attackers. If there are only two modes, why not assigning two different buttons to each rather than going through the effort of switching. But, then I thought it was a kind of challenge to game. I guess that is related to the oft blurred border between interface and gameplay challenges. I also found the semi-transparent shooting mode sign at the middle of the screen, and the accordingly colored propulsions of the aircraft useful. Perhaps the pulsing effect could be a bit less distracting for the shooting mode sign.

I liked the general chill-out music of the game and the minimalist graphics. It was a joy to play. I think it goes well with the general slow pace and easy to survive nature of the game.

What I expected more was the graphic differentiation between yellow and purple attackers. I also think that there is a incoherence between the shooting mode and attackers. If one mode of shooting, yellow, is straight and the purple is distributed, I would also expect that yellow and purple attackers behave slightly different. Maybe one can attack only straight, maybe one can move, maybe one also is able to shoot in different directions at the same time, etc. Also
it can be visualized when the attackers are hit, maybe they fade out for a second, etc. That would enhance the visual feedback of shooting at the targets.

Overall nice game! :)
Baris

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<tr>
<th>Date</th>
<th>Comment</th>
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| 4/21/2013 22:30:21 | Hi Simeon!  
My first thought is that I don't see why it's a side scroller. It's simpler to "Cosmic Avenger" but the player can't drop bombs and there's no ground below, so I feel it would make more sense as a classic top viewer like Galaga. Or maybe even a diagonal isometric 3-d space like Zaxxon? (Sorry about all the 80s references, you'll just have to look them up...)  
Hope all is well!  
Peter |
| 4/22/2013 11:56:04 | Hi Simeon, nice game!  
This is my first time trying it out - to let you know. It kinda took some time to load so it started running in the background for 20sec I thought I am already dead but for my surprise my spaceship was still there. No idea why :)  
I will try to talk about visuals and audio but probably will touch on general stuff, I hope it will be useful.  
The music is awesome, it keeps me on the edge to fight more and get to rank A :)
I liked the look of the spaceship because it feels really realistic, cool. I could imagine something that it takes more than one shot from the enemy to game over/highscore screen. I think I would be more engaged if I knew that it takes more than one shot to get me down. Although the visuals when I die are very impressive.  
I don't know if it is true but the enemy doesn't move that much - but their bullets are kinda cover the whole screen, so I had to move around all the time. I would imagine that I could move the spaceship with my mouse, so it would be faster to go to certain places. But of course it was cool this way too. Sometimes I just felt that I am slow compared to the bullets.  
Loved the power-up stuff, how it scattered around and fly to the spaceship. I could imagine an audio feedback of loading/charging.
In general, it sort of felt hard for me - I was getting the impression that I had to spend much more time to get a bit higher in the ranking :)  
Oh, I almost forgot. The changing bullet type is very neat, I could figure that out quite fast. I liked that with one batch of enemies (also loved that there were a little break in between the enemies!) there were more of one group, so I tended to select one type of ammo and go with that, rather then changing all around - |
because these guys are hard to shoot down... :)

Hope that helps, let me know when you are updating it again
Hugs,
Balazs

6. Links to forum posts:
- Post at TIGSource Forum:
- Post at Unity Community:

7. Link to game source files:

[https://dl.dropboxusercontent.com/u/39910157/biseibutsu/Scripts.rar](https://dl.dropboxusercontent.com/u/39910157/biseibutsu/Scripts.rar)

The archive includes the script files from the final game prototype (written in JavaScript), which might serve as a reference for anyone wishing to prototype with the Unity3D tool.