DOING THE RIGHT THING; GAMIFICATION AS A MEANS TO TUNING HUMAN BEHAVIOUR

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" **Game Over**
> Continue
Save & Continue
Save & Quit "

– Super Mario Bros.

Abstract
This chapter discusses how gamification, the use of game mechanics, game dynamics and game technology within the practice of our everyday lives is both the result of and a driving force in the convergence of physical and virtual worlds, in order to evaluate the promises and risks of gamification. First, we look at the difference between everyday life and games. We'll examine what virtualization is, and how human perception structures space in order to try and grasp (virtual) reality. We'll see how the world that we experience is a map of possible actions, and that our relation to the world is a feedback loop. We examine how in the process of gamification, learning for individuals and groups is fueled by personalization of this feedback loop to allow for faster learning, and how this gamification in turn powers personal guidance in everyday life contexts. It is of particular interest to us to carefully analyze how the process of gamification is intertwined with the human perception and construction of space, how this perception and construction of space determine our (collective) behavior, and how gamification can lead to more freedom and creativity, but also to more monitoring and restrictions (less freedom and less creativity).

Introduction

If the distinction between everyday life and games would have to be summarized into a single sentence, it would be: everyday life is serious, games are not. In our daily life we find ourselves in the very serious situation of working to fulfill our basic needs. This not only includes finding food and shelter (which may seem trivial in our western 24/7 economy), but also love, esteem, and self-actualization. Although we've greatly optimized our 21th century world to find these things (jobs, housing, transportation, education, etc.) we cannot permit

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ourselves too many mistakes or failures as we might loose it all or end up in a position of stagnation. Our actions are influenced by our goals and fears, more specifically by their anticipated rewards or penalties. Because everyday life is serious, we especially strive to eliminate all risks of huge penalties. We need to succeed, even if optimizing chances of success limits our actions to (often boring) actions that have a low anticipated penalty on failure and/or a high chance of success. In everyday life, we stick to proven solutions and do not try new ones. By contrast, games are not serious; a game is 'just a game'. Playing a game could be defined as "the voluntary attempt to overcome unnecessary obstacles" (Suits 2005: 54–55). Compared to everyday life, within a game there is the freedom to stop or leave the playing field, start another game with different rules, or experiment with new solutions to the challenges the game poses. We can also optimize a game to be fun to play. In that case there is pleasure in the activity of playing the game itself instead of (only) in the anticipated rewards. Although with games there is usually still something at stake (honour and reputation for example), these stakes are not crucial to our immediate wellbeing, and therefore we have within a game the opportunity to fail without grave consequences, possibly even the opportunity to fail beautifully. For a game to be a game, after each 'Game Over' there should be a 'Retry' option. And exactly because continuing and trying again after failure is possible (it is often even part of the game dynamics), the player isn't limited to low risk (and low reward) solutions like he is in everyday life, but is instead invited to experiment with new solutions. Games stimulate creativity and freedom.

While being opposites in terms of their seriousness, everyday life and games are related. Humans have always been playing games as part of their daily lives, if only to escape it for a few minutes. But in recent years, everyday life and games have seemed to become increasingly mixed, a process usually identified as the *gamification* of society, the 'use of games, game mechanics and/or dynamics in (the support of) the practice of daily life' (Zicherman and Cunningham 2011). There have been serious elements in games that humans have been playing for ages. They have not just been playing sports or leisure games such as chess or checkers, but also games that definitely contain serious elements, like pistol duels to settle disputes, or gladiators fighting for their lives. But these older games didn't really allow for failure, while more recent *serious games* explicitly do. Game mechanics include *points* (quantifiable measurements and allocations of progress), *levels* (stages of completion with increasing difficulty), *challenges* (obstacles to overcome), *trophies* (prizes for winning contests), *bad*ges (emblems that prove the user has displayed specific behaviour), *achievements* (markers for noting that specific goals have been reached) and *leaderboards* (rankings of users to measure their performance in comparison to others). Game dynamics are the types of behavioral motivation that can be stimulated with these mechanics, and include rewards ("If I complete this action, I'll be rewarded with an object with a certain value."), status ("If I complete this action, others will respect me."), achievement ("If I keep trying, I'll achieve this goal [and prove to myself that I can do this]."), self-expression ("My identity is defined by what I do."), competition ("I want to be the best, I want to be better than X."),

altruism ("I can show I'm part of this community by caring for and giving to others."). Recent gamification has lead to the application of serious games in areas as diverse as business (cost reduction, customer relations, productivity, teambuilding), recruitment (motivation, competition), marketing (points, engagement, loyalty, commitment, rewards), entertainment (engagement, participation), education (motivation, engagement, goal tracking, achievements), science (data analysis, data collection), social movements (engagement, cooperation, solving world problems, crowd-everything), health (fitness, sports, medical care, quantified self, patient monitoring) and warfare (drones, training). In all these cases, game elements (mechanics, dynamics) are used to accomplish serious goals, while at the same time stimulating freedom and creativity like games do. The recent trend[11] of gamification seems to be closely related to a process that can be described as the virtualization of the human life world.

Virtualization

This virtualization of the human life world is in fact not so much a virtualization in the strict sense of the word; it is instead a movement into a life world that is (partially) computationally mediated instead of 'directly' experienced. The concept of the life world is an invention by philosopher Edmund Husserl, and inspired the philosophical discipline of phenomenology, which takes the world as it is self-evidently 'given' as the starting point of all our experience. It then examines this experience of (human) life especially in terms of perception and activity (praxis) (Ihde 1990:31–41). In the case of virtualization, we look at the virtuality and reality of our everyday life world as we experience and live it. To be virtual is 'being equally real to actuality, but in a different manner' or 'the quality of having the attributes of something without sharing its real form' (Wikipedia "Virtual reality", accessed 2016). In other words, a virtual world is something that looks like and behaves exactly like the world, but isn't the world 'as the world really is'. Following this, one can easily see how a computationally mediated world like for example one in a 3D game or Second Life[2] can be called a virtual world, as it indeed looks and behaves like our every day world, yet clearly isn't the same world. While this is a correct assessment (Second Life ís indeed a virtual world), contrasting it with the world of every day life in terms of virtuality would be wrong, because as it turns out, our everyday life world is virtual as well.

The difference between these 'worlds' seems to be in the degree of computational mediation. For Second Life it is clear that this is in fact is a computationally generated world made out of mathematical 3D models, and that if you want to add, modify or delete elements in this world, you'll need the Second Life 3D editor rather than a shovel. In its current state, most of us do not call Second Life our everyday life world, but rather a new context that is in some way an additional layer on top of our everyday life (because, when we live in Second Life, we also still need to take care of our physical bodies outside of Second Life; in a sense we are living two lives at once). So how do you determine that a world is a computationally mediated world? This is a really hard question and the most straightforward answer seems to be: you point out which computational devices or elements mediate the virtual world; in the

case of Second Life, you would need computer hardware, possibly virtual reality (VR) headsets, software and human-computer interaction devices. To a lesser degree, the same identification of computational mediation is possible in life worlds that contain augmented reality (AR). Augmented reality is the activity of enhancing our everyday life world with computer-generated content tied to specific locations and/or activities (Yuen, Yaoyuneyong and Johnson 2011). This is usually done by projecting computer-generated content within the field of view of a subject, usually either through optical head-mounted devices like Google Glass or on smartphones or other screens. Mixing our everyday life experience with computationally generated visualizations is often done to provide specific functionality like for example navigation or metadata that is related to the location the user is currently at (for example pointers on how to find the best rated pizza nearby) or activities the user is currently performing (e.g. travelling from location A to location B). In this case, the subject's everyday life context is enhanced with a new contextual layer, instead of being replaced (almost) entirely like in Second Life. Pointing out computational mediation becomes more difficult with information technologies that have been integrated so tightly into our everyday lives that we are almost unaware of these (Hillier 1996). This is definitely the case with such trivial things as traffic lights and money, but also with grocery stores, and even mobile phones. They don't enhance our daily life and aren't computational contexts stacking up; they *are* our everyday life. Money is an especially interesting example, as we cannot distinguish which of a range of currencies from the Linden Dollar (L$) in Second Life, to the crypto-currenty Bitcoin (BTC), or the American Dollar ($) are more or less computationally mediated than the others. Worlds like Second Life might be impressive, but the process of computational mediation is having its most significant effects in the parts of everyday life where we do not notice this inherently interwoven process within our reality anymore. The apparent similarity between computational mediation and virtualization doesn't imply that they are the same thing. Even if were able to find an aspect of everyday life that is free of computational mediation, it could still be something virtual, because computational mediation is only one specific type of virtualization, and our perception is another one.

How we perceive our world as space

In order to understand how gamification (mostly as a part of a process of increasing computational mediation) changes our life world, we have to understand that our life world as a space in which we live our lives is always a virtual world. We argue that, based on how human perception works, all space is virtual, and that it is exactly the structure of our space that gamification changes, most radical through computational mediation. This holds not only for computationally mediated life worlds (like Second Life, augmented reality and the grocery store) but also for life worlds that are seemingly completely directly experienced and in no way computationally mediated, like for example our life world if we would be climbing a mountain in nature. Space itself is always mental and virtual. This might seem counterintuitive but becomes clear once we examine the nature human perception in more detail. In the perception of reality, 'points of matter' are constructed at a certain distance

(spatial or temporal) from ourselves. We can call these direct or absolute distances. When walking through mountains I can, for example, estimate how far away a particular rock is away from me. In this estimation I will determine the absolute distance between me and the rock. As humans, we are however also capable of calculating distances between two of these points that we have first constructed as points with distances from ourselves; this way, we can construct derived distances. I would for example be able to determine absolute distances between me and the rock, and between me and the ground below the rock. I could then make an estimation of how high this rock is (a derived distance between the rock and the ground), and whether I would be able to jump over this rock or that this rock is too high for me to jump over (a complex derived distance between me and the height of the rock). What is important here is that space is a set of (projected) distances, and that based on the construction of space in the human mind, the human mind postulates the existence of 'the real world'. This means that our life world is not the source of our perception, but the result. It also means that our spatial life world is not a kind of 'objective' essence, but that it is mediated by ourselves.
This insight has been summarized in Immanuel Kant's 'Kritik der reinen Vernunft' (Critique of Pure Reason, 1781). Rohlf (2014) points out Kant's argument that space and time are merely formal features of how we perceive objects, not things in themselves that exist independently of us, or properties or relations among them. "Space and time are not things in themselves, or determinations of things in themselves. […] but "Space and time are nothing other than the subjective forms of human sensible intuition." (Kant 1781:A26/B42; A32-33/B49 in: Rohlf 2014, The Stanford Encyclopedia of Philosophy, online). This is key to Kant's concept of a space and time transcendentally ideal (A28/B44, A35–36/B52). Thus, space has to do with the structure of our perception, rather than the content.
Human perception is a representation of the world. It postulates the things in the world as 'real' things with 'apparent physical existence independent of our perception', and it is exactly in this sense that our perception of reality is always virtual, whether this perception is fueled by input from a computational system or not. Empirical reality can be defined as 'that which has apparent physical existence', and this kind of physical existence is the quality that virtual reality (VR) systems imitate and suggest. The most important difference between virtual reality systems and the real world is that virtual reality objects do not (completely) convince us to have physical existence, while latter do. Virtuality therefore often has the connotation of being 'not-real', but this is only because most virtual reality systems are simply not (yet) convincing enough. Both philosophers like Plato (c.f. Kraut) and works of art like the 'The Matrix' trilogy (1999–2003) have suggested that if we live in a perfect (possibly computationally mediated) simulation, we have no way of detecting the fact that our world is simulated (or not). From within our experience, based on perception alone, if this perception is convincing enough, there is no way for us to determine whether this perception is based on input from or mediated by a computational system or not. If our perception is convincing, we attribute physical existence to the objects that we perceive and they are 'real'. This implies that reality is a property that is based on a kind of judgment or assessment by the subject, and that something that is virtual can have (and often has) physical existence. Virtuality and reality are not opposites. The fact that everyday life is virtual does not make it unreal, and the

fact that some virtual worlds are computationally mediated does not make them unreal either. The reality of these depends solely on our judgment that they are real.[3] From an external point of view (outside the system) we can point out that some realities are computationally mediated, but from an internal point of view (within the system) making this judgment is more difficult – unless the virtual experience is incoherent, incomplete, and not seamlessly integrated with other experiences we have. This might make room for a 'negative' judgment of the virtual reality, in which we know 'this is not real' or 'this is a computationally mediated simulation', but even then we have to take into consideration that our judgment might be wrong. In summary, our experience of everyday life is a process of representation, in which we perceive things at certain distances from ourselves and each other, as objects within space. The mind constructs these objects as real and physically existing objects. This space as a set of distances doesn't only say something about the world that our mind postulates as the source of our perception, but also about us. Reality is both physical and psychological, and our representation of the world is a spatial *map*.

Maps

It is important to distinguish maps from pictures. Both maps and pictures are copies of something else, adapted to a different (usually smaller) scale. A picture is a representation of something else in which all elements of the original have been copied proportionally, like for example when constructing a perfect 3D model of a building on a smaller scale. This means that all elements of a scene that is pictured retain their relative sizes and relations to each other, which gives the picture a somewhat objective status. The picture however usually remains a theoretical construct, as in practice it is very hard to create a picture that is identical (except for its scale of course) to the scene that is depicted; there is almost always some kind of subjective factor present in a representation; even a photograph taken with a camera from a very high or distant position isn't without some perspective skewing.

This is why most representations, including our perception of space, are actually *maps*. A map is a representation in which proportions are only retained with respect to their (subjective) usefulness or importance.[4] To make a map more useful, proportions are often intentionally changed: more important objects are made visually bigger, and less important items are made visually smaller. In many cases, unimportant items might not be represented at all. The pirate who creates a map to remember where he buried his treasure will surely represent the strange group of trees that serves as the landmark from which it is exactly thirty-seven steps east and fifteen steps south that he's buried the chest of gold. He will also make sure the location of the chest is marked with a big X, to signify that this is what the map is all about. But he won't bother to also draw the sun sinking in the sea like it was when he was working hard to put the treasure chest in the ground (unless he has some unstoppable artistic tendencies). Our perception works similarly: our construction of space is influenced not only by our positional perspective like the position of our body, the direction of our head and eyes, but also, and just as significantly, by our psychological perspective: how we perceive things in space is affected by goals, desires, fears and thoughts. If we have a certain goal in mind, all things in the world

will appear either as support or obstacle to reach this goal; if we desire to be with a certain person, all things in the world will remind us of that person, and if we fear a great danger all things will show themselves as either huge risks or safeguards; if we have thought hard about how something works, we will see confirmation of these ideas everywhere, and we'll have great difficulty seeing the things that contradict our thoughts. All this is evidence that space is a map, and that it is at least as subjective as it is objective (if objectivity and subjectivity were comparable at all). Like a map, our perception is not just our registration of the state of the world, of 'how things are now', but it is ultimately a list of things we can do in the world, an array of buttons for us to push. Space is a structure of our options, the actions we can take, and things show themselves in particular as things we can *use*. Again, our perception tells us something about the world and about ourselves, because how we can use things is dependent on our capabilities. While a ladder might enable an adult human person to climb up, it doesn't allow a baby to do so. These relations between subjects and things are called affordances. The fact that our perception is a spatial map of things we can do, that space is a structure of our affordances, adds a richer meaning to the term distance: distance is a measure of the anticipated effort required to perform a certain action or to reach a certain goal. Proximity has to do with usefulness, as well as with the reward or peril that we anticipate. To be able to do better in the world, we need to build better maps, which may also be characterized as deep cognitive structures and activation patterns, and therefore we are involved in a continuous learning process of improving our maps (Churchland 2012).

Feedback loops and learning

This process of improving our maps is a feedback loop. Humans are not passive observers of reality: we shape it. The space of our life world is a map of possible , and with the actions that we perform, we in turn influence the life world, what we can do next, and so on. These actions influence both the life world as well as how it is perceived. Humans act in the world and transform it both physically (by constructing buildings, developing infrastructures, and organizing (social) environments) and intellectually (through our belief systems, education programs, politics and laws, media, arts, and advertisements). Physical and intellectual shaping is intertwined: physical properties determine our beliefs and vice versa. Human development, traditions, conventions, regulations, power hierarchies have always been part of shaping the world. The process of virtualization or computational mediation of the life world is a process composed through individual or collective human actions and changes our world remarkably. It rearranges and reconfigures the space we live in. As computational systems have become more and more efficient, distances have become smaller and, since distance is a measure of anticipated required effort to complete a certain action, actions have become tremendously easier to perform. Communication technologies ranging from the original simple Morse code (1836) to complex technologies like instant messaging (IM) have opened 'worm holes' in the physical network of distances between objects and locations of these objects. We have greatly expanded our reach into the universe (at least from the scale of our

homes or villages to the scale of our planet), and are now capable of quickly ‘using’ objects that we previously had to undertake long journeys to reach: we can talk to our family at the other side of the planet as though they are sitting next to us, we can order products that are regional specialties of regions far away, and all these actions require less effort than even very primary tasks like talking to our neighbours or buying our daily groceries used to cost in the past. It is in this sense that our world has become a global village and that we are living in a networked society. Sometimes it seems like we can be at multiple places at the same time, but a better way to put it would be that space isn’t linear but that it has multidimensional jumps, warps, splits, joints etc. that are determined by our access to or use of it. It has always been difficult to determine where we end and where the world begins; for a blind person, his stick is a very important part of his body, and for a person with glasses, they are a serious improvement to his eyes, allowing him to see further, and with more sharpness and detail. These improvements do not only make people more efficient at the things they already did; more importantly, they allow people to do things they could not do before. As we have externalizes parts of our capabilities to machines outside (or inside) of our body, for example our memory and thinking to data warehouses and server farms, our relation with technology becomes has become more intimate over the years. We have become much closer entangled with the world, and as these computational devices mediate our world, our perception of the world becomes more personal as well. It is therefore no wonder that gamification has had the greatest impact in the domain of learning, because personalization is very effective in learning (see for example math games, Eliëns & Ruttkay 2009). Excellent examples of gamified learning processes with increasing personalization are for example getting awards for recycling glass or batteries (c.f. Battery Man 1998), receiving collectable rewards in shopping experiences (for example super markets that give away free collectibles with each purchase), or technology devices that contain a ‘personalized walkthrough’ to help us learn use the product by using it instead of supplying everyone with the same four inch manual. Personalized learning works better because learning goals, methods and rewards can be adjusted to personal preferences. Because different people are motivated by different types of things, the learning plan can be dynamically adapted to trigger the correct kind of motivation for every individual. Learning using a method that fits personal preferences also makes learning more fun, because it allows every person to learn using a method that they actually like. The learning method can even adapt to the changing preferences of the student during the learning process. Learning is most effective with challenges that are new but that are only just outside the comfort zone of the student (challenges that are too hard will be demotivating or even damaging), but that is still the accomplishment of something new (challenges that are to easy are boring). Repeatedly trying new things can make the new behavior a regular behavior. If the challenges are the same for all students, they will be too hard for some, and too easy for others. Personalized challenges make sure that every student gets a challenge with the ideal hardness, and can adapt the challenge hardness based on performance results and ‘student’ development to keep the challenges optimal even as the student is improving himself (Peerdeman 2010). Making learning personalized doesn’t mean that learning becomes a solitary process. There is also a social component of learning that can benefit from

personalization. Humans are social animals and personalization can use social dynamics to improve the learning process, by for example stimulating support ("Alice is stuck at this challenge. Can you help her, Bob?") and competition ("Alice has completed this challenge. Can you beat her, Bob?"). In the computationally mediated world, social relationships have changed as well; computational mediation allows us to work or learn together or compete with each other even if we are miles apart. Additionally, the organization, cooperation and communication that is required for learning (in groups) benefits greatly from computational mediation, not just during the gameplay itself, but in meta-learning, the process of reflecting on the gameplay and learning 'what has been learned' and 'how it was learned' (Kapp 2012). Most importantly, personalized learning can make sure the learning process fits the individual context of the 'student'. In addition to our own personal preferences, learning also takes place in a certain practical context. If we learn in the classroom, we are usually not in the same cognitive situation as when we actually want to apply the learned behaviour in daily practice. Personalized learning can take into account the exact context we are in and suggest challenges either within the context of daily practice, or as *a layer on top of it* (to make sure we are not punished when we make mistakes in daily life like we normally would be) (Priebatsch 2010). This way our learning context can match the context of our everyday practice as closely as possible, which makes the learned behaviour more relevant. Personalized learning can also take into account our life flow and present challenges at the moments in our lives when we are most ready to learn, and make sure not to present (hard) challenges when we have enough to deal with already (learning would be inefficient in those situations, except in specific cases where we actually need to learn to act under pressure). Because of this increasing personalization (through computational mediation), any situation and context in our daily life world can be turned into a learning experience. Learning challenges of different kinds can be integrated more directly into our daily lives and this way our daily life can become a non-stop training and learning environment. Through more personalized experience, we learn how things work and how we work. When we develop the world, we also develop ourselves and vice versa. And the tools we use to do this have also been developed by us.[5]

Guidance and monitoring – identity, control, responsibility

In the gamification of our everyday life world, our personal goals are ultimately still the same (serious) goals we've always had (food, housing, etc.). We play serious games in the context of our daily lives and in our quests for these serious goals, to improve our daily lives and help solve problems, both those of ourselves and of society. Serious games can help us choose directions, give us guidance and monitor our progress in learning and training; they can help us make decisions and shield us from the dangers of failure by providing built-in levels of protection. This way, self-engineering and social engineering become part of the same process towards Utopia, the ideal (or at least improved) structure of the human life world. The learning process of everyday life tasks can be personalized (adapted to personal identity, daily routine, learning speed etc.) while it the same time stimulates social behavior like collaboration and competition. In these situations, these games are in some sense new rituals, in which humans work, play and live together to improve and solve serious problems.

Because these games are highly personalized, lower penalties on failure, improve engagement and lower required effort, improve loyalty and commitment, and as a result improve efficiency of improvement, they can make it easier to do what is really important and learn doing the right thing. The obvious question here is "what is the right thing to do?", not just because the goals of different 'players' might differ or because individual goals might not align with the goals of society as a whole, but also because even if we agree about the relative importance of the goals of each individual and of the goals of society as a whole, we might not be sure about what exactly our own goals, the goals of others and the goals of society as a whole are. If we want there to be some future for society, the question becomes "How can we align the goals of society and individuals to create a sustainable practical daily life for everyone?". The weighing of all these goals in the calculation of game goals, rewards, scores and participation leads us then to the question "who is in control?" (i.e. whose goals are important?). In order to be able to deliver personalized guidance and learning experiences, serious games will have to monitor individuals very intimately (especially in domains that have to do with individual well being and health (Games for health, accessed 2016), and all this data can be used to significantly influence the behavior of these individuals. We might therefore also say that whoever owns, controls or interprets this data is in control. The issue of control is also important in the practice of measurement. Who determines what is being measured and how it is measured? And more fundamentally: is it even possible for every activity or thing to be measured and be accurately represented in points of data? It is here that we run into the risk of datafication, the process of transforming everything into data rather than using data just to measure the world. And even if 'everything' (as we have seen in the section on perception perhaps by definition) can be measured, how do we make sure that what is being measured is in fact that which we want to measure? In the end, there might be a kind of 'gamepocalypse' (Schell 2010) looming, which stresses the need for a movement of 'counter-gamification', strategies for "disrupt[ing] the processing and exploitation of users' data", and disruptive play (Dragona 2014). It is clear that when everyday life becomes more and more like a game, it is necessary that as a society, we look for rules to govern this game, and make sure that the game is a fair game. Rules of a fair game could for example be (1) every individual decides whether to play or not (freedom to leave the game), (2) failure is possible without grave consequences, (3) there is a 'Retry' function, (4) every individual can set their own personal goals as part of or in addition to the game's overall goals (5) all rules of the game apply to all players. There is work here for philosophers, lawmakers and creators. For ourselves, as individuals, the question is rather: "who do we want to be?" And how can we use these serious games to become who we want to be? We can use them to become more healthy, fit, social, creative and, ultimately, more free, but we can also use them to offload our responsibility for our lives to third parties and gaming systems. Regardless of whether we ourselves or our gaming systems that monitor our data will be in control, as long as we choose our gaming systems, we will have the responsibility to do the right thing, because freedom and responsibility go together. The impact of games is immense, and games 'give us nowhere to hide', but the responsibility for our own lives will always lie with ourselves. There is a need for a narrative and reflection on our choices in the context of games and gamification of

our everyday life, and this reflection is part of our 'project of self', the necessity to shape and develop our identity through the actions and stories of our life. If not through an epic quest for becoming who we are, then at least by affirming our own responsibility for ourselves and the world, and by acting accordingly.

Conclusions and summary

The rise of computational mediation in our everyday lives has greatly impacted the spatial structure of our everyday life world. Distances have become smaller, our relationship with the world has become more intimate, and our reach into the world has grown tremendously. Our access to technologies and the world itself has become more personalized, and because space is our perception of the world and how we structure our possible actions within it, the required effort to complete actions in our everyday life has decreased significantly, allowing us to learn faster and as a result act faster. If we are able to use this learning power to help us get better at the tasks in our daily life, we can use gamification as guidance in the process of reaching our serious goals, while we can possibly at the same time make life a more fun experience. Gamification can in particular be used to (a) stimulate participation (protect players, lower penalties on failure, increase potential rewards), (b) allow new solutions to arise (stimulate diversity and creativity), (c) support transitions (help changing behaviors or conventions in a gentle way), and (d) align goals of society and individuals (improve ourselves and society and learn doing the right thing). Ultimately, life is still a serious enterprise. The risks of gamification are in the nature of games as well. If everyday life will become too playful, we might almost forget about the serious nature of life. We must however realize that if serious goals are at stake, not everything will be fun, or we might be very disappointed. Most importantly we have to make sure that every game will be a fair game. This means that the rules of the game we agree on, like allowing failure, allowing players to leave the game, offering a retry option and allowing individuals to set their own goals should be respected everyone. By choosing our computational systems wisely, we should prevent monitoring becoming a totalitarian force that limits our individual freedom, and we should never forget that we are all in the game of life together: our life world is a social world, and we might have to develop new rituals as part of our collaborative play.

In the end, the question is: are you gaming, or are you being gamed?

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[1] In this chapter we do not discuss how the recent development of gamification hasevolved. It can be argued that the recent gamification through computational mediation is simply part of a much older process of social engineering and token communities and economies (Lemov 2006, Lepper and Greene 1978).

[2] https://secondlife.com, an online virtual world, launched 2003.

[3] Here, we won't go into more philosophical detail about possible subjective and objective factors that play a role in this judgment. For example, we don't want to argue that there is no objective basis for reality, or that reality is completely determined by the subject as subject.

[4] Usefulness and importance are subjective notions, and it is therefore that the somewhat 'objective' or 'truthful' connotation that maps often have can be (ab)used to influence other people in their perception of the world. Maps have to be handled with just as much carefulness as statistics in this regard (Monmonier).

[5] C.f. "we shape our tools and our tools shape us" (this quote is usually attributed to Marshall McLuhan, although the exact origin is unknown.)