Vilnius Academy of Arts

Master study programme
Visual Communication Design

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Communicating scientific research through design.
A creative experiment with microbiology of kissing

Master Thesis

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ABSTRACT

This MA thesis is devoted to development of the communication strategy for the research “Shaping the oral microbiota through intimate kissing”.

Objectives of the thesis are to discover current methods in representation of the research and the image of salivary exchange in scientific, cultural, digital contexts. By identifying their problems and perspectives to propose an alternative communication strategy based on the method of data dramatisation. This strategy designed to emphasize on its (research) explicatory and informatory nature by provoking an emotive response by means of dramatisation. The examination of this hypothesis is an installation based on an algorithm generating visual, sonic and behavioural metaphors for representation of oral microbiota determined by intimate kissing.

CONTENT

INTRODUCTION

Theme of MA thesis is “Communicating scientific research through design. A creative experiment with microbiology of kissing”.

Keywords: kiss, microbiome, bacteria, science communication, data visualization, infographics, digital space.

Object and *subject* of the research are: data visualisation in terms of science communication and research: “Shaping the oral microbiota through intimate kissing” by Kort R., Caspers M., Graaf A., Egmond W., Keijser B. and Roeselers G. respectively. *Hypothesis* of this work is that public communication of the research: “Shaping the oral microbiota through intimate kissing” can inform about ethical issues and emphasize on explanatory methods of the research through dramatisation rather than represent numbers and results literally. *Purpose* - to design a way for representation of the research “Shaping the oral microbiota through intimate kissing” which will catalyze an emotional reaction of the viewer.

Objectives:

- Analyse the current image of bacteria and saliva exchange in scientific, cultural, digital contexts;
- Study existing solutions of data visualisation;
- Identify their problems;
- Highlight the perspectives and methods in visualisation of the research;
- Propose an idea for representation of the research.

Methodology:

- Study and analysis of literature (theoretical method of research). This method is aimed to expand the general knowledge of the subject of research and review the criticism of existing methods of visualisation.
- Analysis of visual material (empirical research method). Collection and comparative analysis of visual material from the field of microbiology and from the field of art. It

will help to determine the visual code which has already been fixed for the representation of microorganisms and the ways of its improvement.

- Case method. Taking a particular research, I would like to explore the situation, understand the essence of problems, suggest an alternative solution.

In the process of science development, there are constant updates of knowledge, ideas and concepts related to the explanation of reality (both material and social worlds). Collecting and systematising of knowledge forms a scientific picture of the world. This explanation of reality goes beyond the scientific community, having a huge impact on public structures and people's behaviour. The translation of knowledge into a more accessible and interesting form for a wide range of people is called a popularisation of science. This field of activity is regularly criticised for primitivization and disinformation, and does not always find a support from the scientific community. The *problem* lays in a fact that the language used by scientists is difficult and not attractive for general public. The fields of modern science are more difficult for popularisation in comparison with the science which commonly was studied at school on a very basic level. Microbiology is one of such fields. The discoveries that are taking place in this area are directly related to the provision of health in society, which raises many ethical issues. While considering these ethical issues, primitivization and disinformation can have a significant effect on public opinion and can open doors to manipulation. The most dangerous problem of science popularisation is the dissemination of scientific myths. When the generalisation of information led to a change in the original meaning or a single case was presented as a rule. Such a knowledge often becomes pseudoscientific and in practice presents a starting point for various pseudoscientific movements. For example, in microbiology, those are activities such as anti-vaccination, HIV-dissidence. In other cases it is not a wrong information but the lack of it that can cause the prejudice — fear of bacteria as pathogenic microorganisms despite our mutualistic coexist according to the recent researches. A lot of people are scared to be infected because of viruses or bacterias, sometimes it can grow into the bacteriophobia. That is why an exchange of body fluids, saliva for instance is containing millions of bacteria, is a controversial subject.

The main point here we should keep in mind — *audience*. Science communication and science itself directed to the different people. It sounds obvious but it is the key point of understanding the problematic and actuality of the topic. Science communication is "the

public communication of science-related topics to non-experts"[1] as wikipedia articulates it for public. And the purpose of this communication is to represent the inventions and results of scientific researches. In terms of my subject - research "Shaping the oral microbiota through intimate kissing", it is the number of bacteria transferred by intimate kiss of 10 seconds long. This number is 8 millions of bacteria as the authors declare. In the body of the research are described in detail the methods how data was collected and calculations were made. Beaucause evidence and explanation are what the rules of science require. But I guess that for non-experts 8 millions and 8,5 millions of bacteria is not a significant difference while for scientists it is. For general public these numbers could be translated just like 'a lot'. Thus the more important information for them is the political and ethical issues of the research. Because it can influence their lives and requires them to take a decision in terms of civil responsibility. And this view should be the main direction in the communication strategy. The next chapters are devoted to the analysis of the scientific, social context of the subject with the aim to proposing an alternative way for topic's representation which would correspond to this statement.

[1] "Science communication - Wikipedia." https://en.wikipedia.org/wiki/Science_communication. Accessed 20 Apr. 2018.

1. CONTEXT OF KISSING AND SALIVARY EXCHANGE

1.1. Saliva in biological context

From the scientific point of view: in terms of microbiology, we must consider human not as a combination of cells determined by our DNA but as a more complex ecosystem — Ackerman J. explains in the article "How Bacteria in Our Bodies Protect Our Health". He reports that in everyday practice starting from the childhood, humans enrich their microbiome by getting new bacteria from environment and interactions with other living organisms under control of immune system. According to the last research "Revised estimates for the number of human and bacteria cells in the body " by Sender R., Fuchs S. and Milo R. a ratio is 1:1. All these microorganisms coexist with human mutualistic or commensal ways performing tasks. But this understanding of bacteria was formed only in last years of studies. Before such diseases as Plague, Cholera, Typhus and Tuberculosis affected negatively the image of bacteria in culture, economy and religion. Nowadays not all mechanisms of their actions are well understood. However the quantity of studies regarding the positive role of bacteria is increased. It seems to be a good tendency according to the article: "How Bacteria in Our Bodies Protect Our Health". The author describe the prejudice about some bacteria in the society which causes changes in microbial makeup and an antibiotics overuse. One of this bacteria was Helicobacter pylori considered a simple pathogen by Blaser M., a professor of internal medicine and microbiology at New York University. But Ackerman describes that: "In 1998 Blaser and his colleagues published a study showing that in most people, H. pylori benefits the body by helping to regulate levels of stomach acids, thus creating an environment that suits itself and its host."[2] and later "A decade later Blaser published a study suggesting that H. pylori has another job besides regulating acid"[3]. Thus "We have a whole generation of children who are growing up without H. pylori to regulate their gastricghrelin"[4] Blaser says. Such example shows the critical importance of research and popularisation of the results in

[2] Jennifer Ackerman, „How Bacteria in Our Bodies Protect Our Health", in: *Scientific American*, [online], 2012, t. 6, d. 2, [cited 2017-11-28], https://www.scientificamerican.com/article/ultimate-social-network-bacteria-protects-health/.
[3] Jennifer Ackerman, „How Bacteria in Our Bodies Protect Our Health", in: *Scientific American*, [online], 2012, t. 6, d. 2, [cited 2017-11-28], https://www.scientificamerican.com/article/ultimate-social-network-bacteria-protects-health/.
[4] Jennifer Ackerman, „How Bacteria in Our Bodies Protect Our Health", in: *Scientific American*, [online], 2012, t. 6, d. 2, [cited 2017-11-28], https://www.scientificamerican.com/article/ultimate-social-network-bacteria-protects-health/.

this field. «Shaping the oral microbiota through intimate kissing» is an another optimistic view on a mutualism of bacterias and humans.

Mouth-to-mouth contact exist as a part of the behaviour for many species of animals, birds and even fishes. A function of such a movements can be very different as delivery of information, objects or food. The same behaviour is peculiar to humans as well. Moreover, some evolutionary psychologists find the base of kiss in the pre-mastication (kiss-feeding). The main benefits of pre-mastication is a production of baby food enriched with useful bacteria. Such bacteria helps with process of digestion and take a part of a baby's microbiota in future life. Interesting that according to the work of Eibl-Eibesfeldt I. "Love and hate: the natural history of behaviour patterns" this way of food transferring has been observed not only between parent and offspring but also between male and female (courtship feeding) as well. Wlodarski R. reports in his research "What's in a Kiss? The Effect of Romantic Kissing on Mate Desirability" that the romantic kiss "involving full tongue contact and saliva exchange" can be used as a mechanism of partner assessment "unique to humankind and is common in over 90% of known cultures"[5]. The participation of microbes in mouth-to-mouth contact between people is obvious for scientists nowaday but reverse effect — influence of romantic kiss on the oral microbiota, was studied only in 2014 by Kort R. in research: «Shaping the oral microbiota through intimate kissing». The scientific research showed that couples have similar microbiota. And frequency of kissing equal to 9 kisses a day is necessary to support this similarity. By one 10 seconds kiss people exchange 80 millions of bacteria, and some of them continue to live in partners mouth as a part of their oral microbiota. Despite an obvious importance of the bacterial exchange, we still have no answer about the predestination of the bacterial similarity of couples. In the research a hypothesis was presented, explaining the need of the similarity of oral microbiotas in couples, from microbiological point of view. It based on the work of Hendrie C., Brewer G: "Kissing as an evolutionary adaptation to protect against human cytomegalovirus-like teratogenesis". They argued that a physical contact such as a kiss could help with an estimation of the partner's quality and could decrease a risk of a disease development resulting from the exposure to pathogenic microorganisms. Moreover Hendrie C. and Brewer G. postulated that: "intimate kissing evolved to protect pregnant women against in utero teratogenesis by human cytomegalovirus, which is readily transmitted through saliva, urine and semen, and would

[5] Rafael Wlodarski, Robin I. M. Dunbar, „What's in a Kiss? The Effect of Romantic Kissing on Mate Desirability", in: *NCBI*, [online], 2014, t. 6, d. 2, [cited 2017-11-28].

cause less severe symptoms when acquired prior to pregnancy"[6]. Thus the salivary exchange can be considered as a part of natural mechanism to build a couple on the same level as shared lifestyle, environment, or genetic factors. While all these factors recognised by society as a symbol of strong stable relationships. It is a curious combination of social construct and biological mechanism with the purpose of procreation. And it naturally leads to an analysis of salivary exchange from scientific and cultural points of view.

1.2. Saliva in social context

For analysis of saliva in social context, I would like to refer to the book "Great Expectorations: The Cultural History of Saliva from Jesus Christ to Iggy Pop" by John D. Thomas. The topic I am interested in is the role of salivary exchange in intimate sphere of our lives as kiss, sex or even pornography in terms of culture. This author should have a great social communication experience currently working as Executive Vice President at public relations and marketing consultancy firm Edelman. Through his work from 1998 till 2009 as a senior editor of Playboy's digital version and as managing editor in publishing division makes his book worth attention for this research. In the book, John D. Thomas tooks a look at a role of saliva in transmission of disease and tried to understand cultural aspects of spit and in particular he questioned: "How and why did kissing ("swapping spit") become a universal sign of affection?"[7]. Moreover, Thomas refers not only to scientific research by the topic but observes such a mass sources of information as Wikipedia, Urban Dictionary, movies (pornography as well) and social media, which could complement the view to saliva in context of pop-culture. In the chapter 9: Spit and sex the author defines the term swapping spit — as "this sloppy colloquialism implies, saliva is integral to the romantic kiss"[8]. John D. Thomas refers to the book of Bill McClain "Makes Flamingos Pink" that explains the origin of kissing through premastication as well as it was mentioned before in current work. But the more interesting point was described — how far away our perception of premastication is from kissing nowadays. In 2012 the actress Alicia Silverstone describes her experience of premastication in her blog, attaching a video of herself feeding a her baby son

[6] Colin Hendrie, Gayle Brewer, „Kissing as an evolutionary adaptation to protect against Human Cytomegalovirus-like teratogenesis", in: *Academia*, [online], 2009, t. 6, d. 2, [cited 2017-11-28].
[7] John D. Thomas, *Great Expectorations: The Cultural History of Saliva from Jesus Christ to Iggy Pop*, U.S.:Strayhorn Press, Kindle Edition, 2012, p.67.
[8] John D. Thomas, *Great Expectorations: The Cultural History of Saliva from Jesus Christ to Iggy Pop*, U.S.:Strayhorn Press, Kindle Edition, 2012, p.1772.

mouth-to-mouth. This post provoked a negative reaction, some of the examples was mentioned in the book: "You know what separates humans from birds? SPOONS? geez."[9] In fact according to Thomas, not all actions including babies and saliva have negative attitude from the public, for example babies can use their own saliva to develop a number of important physiological skills such as voice control. Concerning the West culture by John D. Thomas, while the exchange of saliva between parents and child is a social taboo, the kiss is as "routine as it gets" for younger generation and they are "seeing a particularly seductive smooch in a film or on a television program is their introduction to the art of love"[10]. It opens a discussion in the circles of young people about how much of the saliva must be involved in kissing process. Accordingly with the book "The Art of Kissing" by William Cane quoted in "Great Expectorations: The Cultural History of Saliva from Jesus Christ to Iggy Pop" more than 90% of the interviewed people think that they prefer wet kisses. But it is hard to balance it between excessive salivation, which makes a kiss unpleasant and the risk to be considered as avoiding intimacy. So it is possible to find a lot of posts and manuals with the advice of how to kiss properly and not to scare your partner. One more important issue except of personal preferences, which appears in these discussions, is the transmission of disease through an intimate kissing such as HIV or a cold. John D. Thomas questions why we keep kissing despite of our fear of getting HIV. Further in the book it will be explained that it is a very unusual case this a man infects a woman by kiss. But for current research it is interesting with the high level of public awareness and ignore of it in favor of keep kissing ,which was not explained in the book, being opened for speculation. The other intimate process which involves human saliva, besides kissing, is sex. John D. Thomas in his book cited a Cosmopolitan magazine website where one of the readers asked about appropriateness of using saliva as lubricant. He received a quite positive response to it, explaining that the use of saliva as lubricant is a very natural and old practice, in case both partners do not have any infections to be transmitted. The author of the book mentioned some Eastern practices in which saliva can be considered as medicines, especially when it was taken during the sexual activities and could be used for treatment, based on the believes that it collects life forces, which can be transferred to a partner. While in Taoism — "it is believed that, for women, concentrating on creating more saliva is a way to increase her sexual energy and to restore

[9]John D. Thomas, *Great Expectorations: The Cultural History of Saliva from Jesus Christ to Iggy Pop,* U.S.:Strayhorn Press, Kindle Edition, 2012, p.576.
[10]John D. Thomas, *Great Expectorations: The Cultural History of Saliva from Jesus Christ to Iggy Pop*, U.S.:Strayhorn Press, Kindle Edition, 2012, p.1812.

and preserve youthfulness"[11]. But lubricantes is not the only way of saliva use in sex. For more unique practise John D. Thomas refers to fetishes and the porno industry. There is no reason to mention the list of practices, but it is more interesting to research the attitude to it. And first of all, a mass source of information such as Urban Dictionary describes the practice differently, in the routh way using user-invented terms which sometimes sound aggressive and offensive: "Spit and polish: Refers to oral sex, where in the act of a blow job the giver "spits" on the knob to help with lubrication". Because of this, the knob end tends to look shiny and "polished". This style of blow job is seen in a lot of porn movies. It is an extension of a guy asking for a "polish", meaning he would like oral sex. "My ex used to give a real good spit and polish"[12]. The reasons of this aggression was not explained in the book, as well as in any available researches, but some discussion about it goes into feminist discourse. Though one controversial thing was cited in the book. It describes "Cambria list". According to John D. Thomas it is a guideline for porn producers how to avoid claims from members of "the Bush Justice Department" created by Paul Cambria in 2000. The list includes such a rules as "No black men-white women themes","No coffins" "No fisting" "No squirting" and ban on saliva/spitting as well. In terms of this list John D. Thomas wonders how strange it is that the salivary exchange takes such an important role in intimate relationships, as we can see, but at the same time can be forbidden for representation because of potentially aggressive use: "We want to swap spit with the ones we love most, but doing that is so potentially offensive it made a list of key don'ts in the adult film industry. Hard to swallow?"[13] Thus, we can see that saliva has not one unique use and attitude to it and it strongly depends on the context and people's experience. It is making our scientific research about kissing even more difficult for representation. Different group of people by age, gender, nationality, style of life etc., guided by stereotypes, can react and understand it unexpectedly. If googling the research by keywords "intimate kissing and bacteria", in addition to the original research, you can find a huge number of articles referring to scientists who have proven: "up to 80 million bacteria sealed with a kiss". Almost all titles look like this, with minor changes in the combinations of the words. For sure it is a catchy headline which attracts more visitors to the website of the magazines, because it refers to intimate life and is provocative enough . But does it represent

[11]John D. Thomas, *Great Expectorations: The Cultural History of Saliva from Jesus Christ to Iggy Pop*, U.S.:Strayhorn Press, Kindle Edition, 2012, p.1912.
[12] John D. Thomas, *Great Expectorations: The Cultural History of Saliva from Jesus Christ to Iggy Pop*, U.S.:Strayhorn Press, Kindle Edition, 2012, p.1956.
[13] John D. Thomas, *Great Expectorations: The Cultural History of Saliva from Jesus Christ to Iggy Pop*, U.S.:Strayhorn Press, Kindle Edition, 2012, p.1989.

the idea of the research? Does the audience receive the information they expect from the article? Do they read it to the end or are they pleased with the scary title, thinking how disgusting it is? These question make us think that for the most accurate representation of the research, it is necessary to abstract from emotions, because the amount of bacteria transferred is not the single point of the research. Thus if you open articles, inside we will be able to read the reformulated text of the study, which leaves you a bit disappointed in comparison with the title. Emotions have a bad fame in the scientific world, because exact sciences are something unprejudiced, it's facts. In science communication practice we can see that emotions are used as a cherry on top, some decoration or as a attractive headline. But inside it is just science. However, in this representation of the research about intimate kisses and bacterial transfer, we should not run away from emotions and human experience. It is probably worth using emotions for a more accurate illustration of the process and ideas, turning the viewer into a participant.

1.3. Saliva in digital context

Speaking about saliva exchange during the intimate kiss we always should take into account the romantic relationships between people, both from a sociological and microbiological side, as we can see from the previous parts. And participation of saliva in intimate relationships seems to be quite obvious. But nowadays intimate relationships and kissing can not be determined only by real physical experience. According to the article of Jean M. Twenge “Have Smartphones Destroyed a Generation?” published by Atlantic magazin in 2017 the youth generations are spending more time on their phones, communicating in social media rather than in reality[14]. Despite of the polemic in the article how bad influence it is, I propose to focus on the fact that interaction, romantic relationships and intimacy has strongly been changed by contemporary digital media. The new alternative reality created by digital space hosts our habits, develop them and design new ones. Social media as facebook, twitter, instagram, eliminate the space constraints, helping with communication for people from all over the world. And we can easily support any kinds of relationships in non-place by chatting (text, images or video). Writing about non-pace I would like to implement M. Augé’s term, which he invented for a description of the places where person stays anonymous and temporary. These places are intermediate or alternative, such as

[14] Jean M. Twenge "Have Smartphones Destroyed a Generation?”, in: The Atlantic. https://www.theatlantic.com/magazine/archive/2017/09/has-the-smartphone-destroyed-a-generation/534198/. [online], 2017, Accessed 26 Feb. 2018.

hotels for instance. This term can be used for the determination of social media space also when we speak about digital space as a reality, where the people can be temporarily placed. Communication and relationships are always strongly connected with emotions. The realism and effectiveness of interactions we used to measure by accessibility and convenience in their (emotions) transmission. Thus, we can see the tendency of how technologies of communications are developing in the way of representation of our emotions. I'm speaking about how we moved from text description of what we feel to a more effective, fast way as emoji. Furthermore, we evolved into a more developed spectrum of emotions displayed in stickers and gifs. Customised emojis are now available with a new Iphone. These technologies do not only imitate a real life but are creating the new rules, traditions and practices of flirting and courtship. The likes connected to selfies can be judged as a token of attention and the speed of response in the messages as an indicator of importance for a partner. To show passion or love today is possible by a special language of hearts icons and kissing gifs, preluding sending nudes and to have sex in video chat. The phenomenon of "sexting" is when young people share naked photographs of themselves with each other via their mobile phones. Moreover, we can see some development of gadgets as "Kissenger" to imitate kissing in conditions of long distance relationships. This physical interface designed to transmit "the amount of force that a user applies to a pair of lips which is recreated on the other device using motors"[15]. It should be noticed that speaking about new technologies and spaceless-borderless digital worlds, from the practice of kissing was token almost all of components, physical and emotional, except of saliva or bacteria until now. Growing interest in technologies that support intimate relationships with others by transferring emotions was concentrated on communication quality more than to salivary exchange. Face to face communication is inherently limited to those who can can see or hear. The telephone allows for group calls, but the upper limit on how many a group can admit or maintain is small. In contrast, many forms of digital communication can be seen by any internet user. Messages can reach any people who has internet connection. Accordingly to the book "Personal Connections in the Digital Age: Digital Media and Society" written by Nancy K. Baym the internet has brought to all of its users the possibility of forming relationships that, ignoring physical limits of distance, create alternatives transcends space as "shared location"[16]. But it

[15] "Kissenger: Design of a kiss transmission device (PDF Download ...." 21 Dec. 2017, https://www.researchgate.net/publication/254461975_Kissenger_Design_of_a_kiss_transmission_device. Accessed 25 Feb. 2018.

[16] Nancy K. Baym, *Personal Connections in the Digital Age: Digital Media and Society,* U.K.: Polity Press, 2010

would be unreasonable to use the word “location” here as physical space representation. The metaphor of space is particularly used in visual online environments as games for instance where worlds built through code with a purpose to experience as semi-physical realities. Thus the informations placed in this shared locations will be equally visible for all here in spite of spatial limitations. As in the case of Twitter, one of such a shared locations, the provided tweets can form some groups of user interested in the same source of information. In other words it is a system of account and followers. Or user how will be combined by one hashtag. All of them it is possible to engage by common practice and sphere of interest which actually gives a permission to call it communities. It fills our identity and group affiliation by identifying us with a particular online community. Communication in digital space makes us do not feel lonely being alone in the physical space. And this magic power should be explained in term of “proxemics” - a study about human feel of required space which should be settled between themselves and others[17]. The term was invented in 1963 by Edward T. Hall, the cultural anthropologist and it divide a interpersonal distance into three types: intimate, personal, social and public distances measured in centimeters. While we rethink the measurement in digital space, so we could see the new ways of understand of intimacy/interpersonal space as well. Such tools of communication as social media changes way of personal data representation and accessibility following the changes of physical space by the same principle. Nowadays in internet it is possible get lost among the huge amount of information at the same time to be in front of everybody. We use physical space and direction for orientation and identifying ourselves with respect to other objects around us in reality. The understanding of distance helps us to realise what is further and what is closer or what it intimate space or what is public. But in digital space we have no constate as centimeter to measure distance. As we wrote before social media environment represented by shared locations which have no size. So in this case the personal/intimate information which the stranger can attend limited not but the space, distance or physical borders but by the fact what was charged in general. By the way i’m not speaking about the information that should be hidden by default as personal identity or credit cards info. The opened information as preferences, relations, photos and etc. which we do not need to protect until interventions is more interesting in terms of intimacy. And the amount of the such information is incredibly huge.

[17] "proxemics | Definition of proxemics in English by Oxford Dictionaries." https://en.oxforddictionaries.com/definition/proxemics. Accessed 26 Feb. 2018.

2. DATA VISUALISATION. THEORETICAL APPROACHES

The artistic and visual design work nowadays occupied a niche of journalism and science communication as a tool of media production because of the illustrative, representative potential of any graphic expression, which was discovered by archaic humans in "Cave paintings" with narrative purpose around 35,000 years ago[18]. We are using drawings, illustration, graphs and computer renderings to effectively transmit or conceptualize knowledges erasing linguistic and cultural boundaries to be sure that the importante information will be reliable, clear, quick and memorable. Visual representation in science differ significantly in terms of how they relate to what they should present, the means, processes, and methods by which they was produced. The diversity of forms and applications can not be unified and generalized into one common practise. It is accompanied by constante updates and it open a huge space for design innovations and experiments. According to L. Pauwel: "Representational practice in science often do not speak merely to reproduce visual or non-visual phenomena but also to provide visual data representations (e.g., charts) of aspects of these phenomena based on measurement of some kind (length, weight, thickness, resistance, quantity, temperature, verbal responses, etc.)"[19]. Thus the data we should consider closely connected with observance of reality which helps the scientist see correlations and changes (not necessarily visible in nature) much more clearly, L. Pauwel reports. The same can be used not only for research purposes but also for explanation of scientific information to unprepared audience to explore persuasiveness of the graphical representation for learning purposes as well. And this educational functionality of data visualisation broadly used in Science communication because it helps to any reworked for a wide audience information to be more demonstrative. But "what is it to be clear?", "what level of clearness we need to attend?" and "What methods of theoretical traditions we could use to reach the goal?" are still open questions which pushes a development of visual communication design all the time. That is why it will be good to briefly go through the traditional practices of information graphics and explore the latest trends in data visualization.

[18] "Cave painting - Wikipedia." https://en.wikipedia.org/wiki/Cave_painting. Accessed 1 Mar. 2018.
[19] Pauwels, Luc, ed. *Visual Cultures of Science: Rethinking Representational Practices in Knowledge Building and Science Communication.* U.S.: University Press of New England, 2005, p.2.

2.1. "It's Not the Style, It's the Content"[20] - Traditions of Data visualisation

Speaking about Data visualisation we determine it as tool of representation of complex data which helps us to see correlations or general direction - trends. According to the article "The Physical Visualization of Information: Designing Data Sculptures in an Educational Context" Data visualization is "a means to understand and analyze complex data sets, has mainly focused on supporting scientific goals and optimizing analytic tasks."[21]. The authors searching for new ways to develop infographics which typically based on semiotic and our visual perception. The same ideas of perception was fixed by A. Cairo in his book "The Functional Art: An introduction to information graphics and visualization". He writes about our possibility to understand and to see as a intertwined processes: "We understand because we see"[22]. This rule works on both sides, seeing precedes understanding, and this understanding precedes a better, deeper seeing down the road. I would like to ground my study about traditional practice in data visualisation in A.Cairo's book because of his experience in the specific field of visual journalism, the author is familiar with art departments in magazines, newspapers, infographics directing in general and he teaches courses on information architecture and data visualization to journalism students. According to A. Cario's ideas that any data visualization and infographics combine both representational and explorational purpose but to varying degrees. And it is a work of graphic designer or informational architect to do the accent and focus on representational or explorational functions. By the way traditionally the representational function of infographics is seeing in terms of beauty and esthetic. More properly, A. Cairo explains a good data visualisation purpose "to be beautiful thanks to its exquisite functionality"[23]. Writing from his experience he notes that most of the designers forgot about functionality in favor of aesthetic appeal and that it is not a proper way to work with data. In terms of functionality the main goal of visual communication designers is to systemise, generalize particular intellectual, in our case

[20] "The Physical Visualization of Information ... - Andrew Vande Moere." http://infoscape.org/publications/vinci09.pdf. Accessed 5 Mar. 2018.
[21] "The Physical Visualization of Information ... - Andrew Vande Moere." http://infoscape.org/publications/vinci09.pdf. Accessed 3 Mar. 2018.
[22] "The Functional Art: An Introduction to Information Graphics and .... - Alberto Cairo." http://ptgmedia.pearsoncmg.com/images/9780321834737/samplepages/0321834739.pdf. Accessed 3 Mar. 2018. p.14
[23] "The Functional Art: An Introduction to Information ... - Alberto Cairo." https://www.goodreads.com/book/show/13705587-the-functional-art. Accessed 3 Mar. 2018. p.18

scientific, information and to create a tool for the eyes by reliably transfering the data to the brain. And this is what makes infographic a form of communication despite the huge number of forms, techniques and theoretical traditions by which it can be implemented. Thus it drives the author to find a method of information architecture which helps to make a reality more visible. Generally, A.Cairo represents visualization as a technology which aims to help an audience complete certain tasks, which makes it different from fine art. By this logic the form has to be determined by the functions of information. "There may be more than one form a data set can adopt so that readers can perform operations with it and extract meanings, but the data cannot adopt any form? Choosing visual shapes to encode information fshould not be based on aesthetics and personal tastes alone"[24]. Here it is important to note for the author of adheres the view of some objective criteria, which an information architect should be guided by and this criteria is funcuanality. And it is the main one. By the way the esthetic part he determined by general expectation and personal preferences of audience as well. This means that, according to A.Cairom, the designer should be informed about some general rules, namely: what is functional and beautiful for the viewer? Moreover, this functional or problem solving view of design is quite common. Going through the book "The Functional Art: An Introduction to Information" the author created the "Visualization Wheel". This wheel represented by the axes, correspond to the main opposite qualities which needs to be balanced in the process of data visualisation, such as: Abstraction and Figuration (the balance of realism or mimicry between data and visual representation), Functionality and Decoration, Density and Lightness (level of compactness), Multidimensionality and Unidimensionality (amount of visual codes used to navigate a reader through the different types information), Originality and Familiarity, Novelty and Redundancy (amount of methods used to explain the main idea of information). This scheme provides interaction and balance between axes also. For instance, Originality/Familiarity and Novelty/Redundancy, according to A.Cairo, the relations should be constructed this way "The less common the graphic form I choose for my visualization, the more redundancy I should include"[25]. All these practical rules are aimed to create priorities for human eyes and show not how the particular data looks like but how it works. The author concludes that human brain actively understand surroundings by using

[24] "The Functional Art: An Introduction to Information ... - Alberto Cairo." http://ptgmedia.pearsoncmg.com/images/9780321834737/samplepages/0321834739.pdf. Accessed 3 Mar. 2018. p.42

[25] "The Functional Art: An Introduction to Information Graphics and .... - Alberto Cairo." http://ptgmedia.pearsoncmg.com/images/9780321834737/samplepages/0321834739.pdf. Accessed 4 Mar. 2018. p.83

rules and tricks to do it and "The better we understand the shortcuts the mind use s to make sense of the world, the better we will be able to anticipate the m and to take advantage of them for our purposes"[26]. Thus in competition between functionality and esthetic, according to the author, the structure of the visualisations becomes more important than the style of it.

2.2. "Being a catalyst rather than a source of visions"[27] - New values in Data visualisation

Contrary to the opinion of A.Cairo, currently we can see the trend of increasing emotional (artistic) methods and democratization of the practice of data visualization and how this area was modified by it. One of the new theoretical approaches which were developed recent years is a 'physical visualization of information' or '*embodiment*'. This approach and these terms were described in detail by J. Zhao and A. Vande Moere in the article "Embodiment in Data Sculpture: A Model of the Physical Visualization of Information" from the conference "Digital Interactive Media in Entertainment and Arts 8" 2008. The article analyses the role of information in the modern world and the need for data representation in a more memorable and intuitive way. According to J. Zhao and A. Vande Moere: "visualization is traditionally considered as a tool that is neutral, dispassionate and objective, as it caters for the solutions to well-defined and specialized task of its expert users"[28]. This basically corresponds to what was described by A. Cairo. While data visualisation often used as factual descriptions, aesthetic of its sculptural form helps people to attempt the content more successfully using more types of perception and establishing emotional contact. I completely agree with this critic of traditional approach to data visualisation. The authors study the process of expressing abstract data in the physical form through a metaphor - 'embodiment'. They think that: "… using metaphorical distance as a scale, our model analyzes the connection between data and representation, and the connection between representation and the audience's knowledge and experience"[29]. The appeal to this knowledge and experience justifies the effectiveness of communication with the viewer and expresses the high potential of this model in data visualization. One of the artists who grounds the artistic practice if this

[26] "The Functional Art: An Introduction to Information Graphics and .... - Alberto Cairo" http://ptgmedia.pearsoncmg.com/images/9780321834737/samplepages/0321834739.pdf. Accessed 4 Mar. 2018. p.132
[27] Dunne, Anthony, Speculative Everything, US: MIT Press, 2013, p. 16
[28] "The Physical Visualization of Information ... - Andrew Vande Moere." http://infoscape.org/publications/vinci09.pdf. Accessed 4 Mar. 2018.
[29] "The Physical Visualization of Information ... - Andrew Vande Moere." http://infoscape.org/publications/vinci09.pdf. Accessed 4 Mar. 2018.

field is Adrien Segal. It is interesting that Wikipedia (mentioned here as recourse of average public opinion) recognized here as a data sculptor and "a pioneer in the field of data visualization"[30]. She works with physical materials in infographics of environmental changes. Here the way of communication is the use of the quantitative data from scientific data services and to represent its illustrative way by mimicking nature landscape which directly determines its visual characteristics such as its shape, color or size to represent the emotion, context or background at the same time. Considered to her works "Tidal Datum" and "Trends in Water Use" the artist observe the problems of water change and chose the aesthetic of waves to represent the data. The possibility to touch and feel this sculpture creates the new atmosphere, by which it is easy, more interesting to study data, lingering longer in the mind. Physical experience of communication with sculpture does the scientific data more accessible and understandable because of visual similarity with real three-dimensional objects – waves. The form of chart directly reflects the visual aesthetic of movements and changes in waves by analogy with traces on the sand. It refers to a viewer's memory and causes nostalgia. In this case background knowledge of viewers was used like a base to expand the topic and memorize new information. Implementing J. Zhao's and A. Vande Moere's ideas of semiotic taxonomy, we can conclude that the form of the sculpture represents the information as 'iconic' meaning and transfers ideas of irritation by images of dry landscape – like 'symbolic' meaning. This combination creates another memorable and clear massage. It is easier to see the water level decline by the tracks on the walls because it is more natural and evident sin of water disappearance for us. Thus, the author interacts with the beholder through his personal experience which gives an opportunity to study effectively. This means that the data sculpture concept is more emotional, experience directed and multiplies the ways of getting information. It includes senses of perception as sight, hearing, taste, smell and touch, the same senses we used to study the world around us in childhood.

Separately from the Data visualization, I would like to focus on the general understanding of design and ideology which meet the present crisis based on the 'speculative design' theory by A.Dunne. Moreover I think that his ideas and critic of functional design are extremely relevant to infographics in particular. In the book "Speculative everything" A.Dunne explains that in most of the cases, speaking about design, we see it as problem solving tool. And problems could be not only practical or material but esthetic as well. Our optimism pushes to save the world but realizing that most of the issues are unfixable - we

[30] "Adrien Segal - Wikipedia." https://en.wikipedia.org/wiki/Adrien_Segal. Accessed 4 Mar. 2018.

meet a crises. My first tension to create an ideal infographics can be one of it. Solution according to the author is to change: “our values, beliefs, attitudes, and behavior”[31]. To change the behavior means to stop training predict problems with a purpose to resolve them. “Future predictions have been proven wrong again and again. In our view, it is a pointless activity”[32] writes A.Dunne. To say again and again to people what their problem is and what they should do sounds autocratic. Instead of it the book “Speculate Everything” proposes to concentrate on the presence and think what the future people will be passionate about or not by freeing your imagination. This practice aimed to question our reality and to open a discussion around it. Even just in this particular moment of dreaming we will do the first step into the future. As an example I would like to observe is a work of A. Dunne and F. Raby by the name “The Statistical Clock”, a part of “Do you want to replace the existing normal?" series. This clock sounificates the events (fatalities) using BBC website by speaking out loud the numbers from one and so on. As the author explains: “We imagined a world where there was a desire for products that met existential needs, reminding us of the frailty of life”[33]. These products catalise debates, public and inside of the viewers minds, if we actually want to hear about how we will die? Creating such speculative and fictional objects, useless and unsaleable, designers do not manifest/show reality but simply stimulate the vision of it. The same method could be used in informational architecture also because the dream: not to show a viewer but “make see” extends throughout all the theoretical practices of data visualisation. In this example we can see that not the number of the accident are the most important stuff, but the ethical questions of the future. These questions need to highlighted in the subject of my thesis similar to “The Statistical Clock”. But spearing about data visualisation the method which I decided to implement is ‘*data dramatisation*’. I would like to describe this term with a quote of speculative architect Liam Young: “Data Dramatization, as opposed to data visualization presents a data set with not only legibility or clarity but in such a way as to provoke an empathetic or emotive response in its audience”. This quote point the focus from numbers to feelings in infographics and in perfectly correspond to the since communication needs (determined by the specific of the audience) which we described before in introduction. In the context of my own practice ‘data dramatisation’ used to mixed the reality of my chosen and digital reality by example of Twitter. The development of it will be presented in the following chapter.

[31] Dunne, Anthony, *Speculative Everything*, US: MIT Press, 2013, p. 16
[32] Dunne, Anthony, *Speculative Everything*, US: MIT Press, 2013, p. 16
[33]Dunne, Anthony, Speculative Everything, US: MIT Press, 2013, p. 43

3. VISUAL CONCEPT AND DESIGN DECISION

Applying for my MA study I was totally inspired by since communication practice and how difficult and sometimes boring concepts could be transformed into adventure and interest people. During the first semester I decided to research what actually a designer can do in this field and a first idea which came into my mind was infographics. Basically science communicator work with the information or data (as a result of research) trying to create an appropriate representation for it. Thus I started with a visual mind map to organise and clarify my thoughts about it.

On this map [img. 3.1] for red circle I placed few poles: scientific community/general public as an audience where infographics can be used and art/design - work sphere where it (data visualisation) can be released. The yellow circle concerns the tools and artistic practices. At first data visualisation can be research and inform tools by it purpose. Scientists use visualisation in reconstruction (technical drawings), medical mapping (roentgen), experiment. The goals of the visualisation for scientists in this case is to discover some new information. While since communicators use visual products as informational tools to reach general public, and explain some existing knowledge to them. Referring to artistic practice I would like to relate it with performing art and design respectively. Scientist performs visualisation to create new knowledge - research, overwise science communicator prefers infographics to show results of research. I would not cretisie any of these ways because they look quite rational for me - functional. But if we want to find new way in representation of the chosen research it time to doubt the obvious. Regarding to the mindmap I realise: What if we switch the rules. By the way it did not happen this particular moment in past but few month ago after my experiment with graphs literally.

On the first steps the ideas of problem solving design and functionalism drived my mind to search for a more effective or even ideal way in informational architecture which aimed to be implemented for any type of information keeping it clear and functional. In this period the book “The Functional Art: An introduction to information graphics and visualization” by A.Cairo was considered by me as a manual. Meanwhile for the object of my study was chosen the scientific research of human microbiota and how kisses influence to it. It was curious to realise how such invisible microbes which was part of my body since I was born become more real and importante for me just by reading the work of scientists and I had

the idea that everybody should share this feeling with me. Thus I decided to count my keeses and structure it for myself by the simple graphs. Social media in my case was single resource of data where each “kiss” word and emoji was recorded because it was impossible to insert this date from real life which was not fixed on the photo for instance. Actually only now I realised how many personal data we can find in the internet but that time I just picked the source which i had. I collect my personal messages and asked for the some from friends to create some kind of database based on facebook and twitter. The first graph [img. 3.2] illustrates the use of “kiss” word in the facebook messenger during one year of distance relationships. And as we can see the frequency of using this word is not uniform. The couple used the ‘kiss’ less each period of time when they was together in real life. For sure we can not make any conclusions based on just one example but it drive my mind to think about the reasons and ways how real kiss was simulated in digital space with an development of social media. I personally probably spend most of my time in messengers and other social medias and I can say that talking by the phone becomes more and more uncomfortable for me. In addition, I am guided by the reason for easy storage of information in written correspondence, for instance i can easily find in the chat history place and time when we agreed to meet with somebody. However, let's move on to the next graph and postpone all ideas about social networks for later. As I did then.

On the second graph [img. 3.3] I asked few friends to provide data from their personal chats during February. In this case I tried to fix in which days the word was used, how often and whether the Valentine's day affected it. It was too naive to expect any significant results from it as I can conclude. However, I decided to continue working with this data and try to represent them based on my chosen research.

This time I realise that in my mind a message “kiss you” is quite equally to a physical kiss in terms of emotions and intimacy but it doesn't work for bacteria transferring. I mean in digital space we try to imitate the feelings as love for instance and to imitate the process of kissing, even sex. But bacteria was not represented in this non-space environment as internet. And I proposed few ideas to work with my data based on the concept of distance relationships supported by new technologies and speculations about future needs of society. I tried to rethink the ways on communications between partners integrating bacteria in this process. Next, I would like to describe a few initial ideas with which I worked:

My first idea was to count how many bacteria we lose by using emoji of kiss in social media and to do the data visualization of it like a graph or calendar constructed by the Petri

dishes with the real bacteria in it. This was supposed to be an attempt to grow as much bacteria as I kille by emoji in sterile digital world, some kind of revival or resurrection of them to achieve a balance. Thus, it had to open a discussion about importance of a real communication by comparison with perfect bacterialess digital world, where you cannot get anything from your partner. I created a prototype for installation on the example of one month - June. It was a square of plastic with holes for the petri dishes in it. Petri dishes replaced themselves in the month forming a calendar as you can see on the image 4 [img. 3.4].

According to my idea, I was going to grow bacteria in these dishes according to my graths. To do this, in each of them it was necessary to prepare a nutrient medium on the basis of water and agar, then transfer the bacteria from the mouth to the petri dishes by kissing the medium. After a few days the mouth bacteria would have to appear on the surface of the environment in the places of the kiss as illustrated on the image 5 [img 3.5].

Encouraged by the idea that bacteria are not visible to the naked eye and only large colonies are visible on the photos, I decided to think how to show them to the viewer more clear and fascinatingly. During the reflection and the search processes, I came across the possibility of creating fluorescent bacteria. Genetic engineering technologies now allow to manipulate with the genetic material of an organism, bacteria for instance. Often to include the DNA from a foreign organism which has bioluminescent abilities. And nowaday it is possible to do by using special tool as “Bacterial Transformation Kit”, it transforms bacteria by introducing a gene from the bioluminescent jellyfish. As a result your bacteria will light in the dark. Glow in the dark seemed to me a great metaphor for the representation of the enlightenment ideas and science communication. Also, the glow could illustrate the hidden potential and importance of such small organisms as the bacteria inhabiting our mouths. Despite the fact that this kit is designed for students of medical faculties, in the process of developing the concept I came to the conclusion that it will not be possible for me to make this experiment at home. This was not the only obstacle in the implementation of this idea.

My desire to grow some real bacteria was justified by theoretical concept of “Embodiment” but at the first stage of cognition and development, the form of calendar was still a traditional data visualisation. And this does not allow to realize the educational potential of physical visualisation which we described before by example of A.Segal’s works. This concept illustrates the idea literally, replacing the graths with a calendar. Being critical to this idea today I can understand that “Embodiment” should not be determined only by mimic of nature. The main point is an embodiment of human experience and practice. Thus if this

practice was changed, representation should follows it. This particular conclusion guide me to think about current changes in our perception of romantic relationships provoked by social media. What tools we use to imitate kissing process in digital world and why bacteria was ignored. In the article "Design in the age of Biology" H. Dubberly explains that with the progress in our understanding of Biology we will have the changes in our picture of the world similarly how it was with understanding of physics in time of industrialisation. The author notes: "Already we can see the process beginning. Where once we described computers as mechanical minds, increasingly we describe computer networks with more biological terms — bugs, viruses, attacks, communities, social capital, trust, identity"[34]. But still nothing about bacteria.

The second concept which I developed was to create a product - "Bacteria kit" to keep your partner's bacteria with you and to make the relationship stronger referring to the idea about positive influence of bacteria from my chosen research. With this product it could be possible to escape relationships at all but keep your bacterial diversity using this tool also. I wanted to speculate with the future and technologies and propose some kind of pills or test tubes containing other person's saliva. Or how Anthony Dunne explains this method in his book - 'Reality for sale'. It had be the reference to the practices of artificial insemination or freezing of sperm and oocytes for the future. I came up with this idea because I was interested in experimenting with the conflicting feelings that saliva and bacteria cause in us. Researching this area, I got acquainted with some works of creative duo Meatwreck. Two artists, Mitra Saboury and Derek Paul Lack Boyle build their creative practice in the field of the object-centric photography. In the photo the artists experiment with our everyday objects creating "tensions in the image between the real and the constructed[35]".

By looking to their photos it is possible to feel some kind of 'underside of familiarities'. And the things, which are comfortable or normal in our everyday life but tabooed, are hyperboleted by artists and intend to be normalised again by social media. This is the way how I understand this term. It is an identification of the way how our familiarity is socially constructed. You can discover some examples of Meatwreck's works below [img. 3.6].

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[34] "Dubberly - Age of biology - 2014-06-27a.indd - Dubberly Design Office." http://www.dubberly.com/wp-content/uploads/2008/09/ddo_article_ageofbiology.pdf. Accessed 5 Mar. 2018.
[35] "Gross out in the warped world of photography duo Meatwreck | Dazed." 28 Jun. 2016, http://www.dazeddigital.com/photography/article/31764/1/gross-out-in-the-warped-world-of-photography-duo-meatwreck. Accessed 3 Apr. 2018.

Working with this concept I noted that: “To take saliva like medecine sounds unpleasantly and disgustingly but I think these feelings are the additional level of meanings for the project because it shows disgust to saliva more like a social construct then biological reason also. By this idea I propose to rethink our perception of “purity” and to fight against taboo about salivary exchange and saliva itself. Guided by it I experimented with the packaging of saliva which will keep and highlight sensory experience of touching it [img. 3.7]. I put saliva in clear plastic bags. This package allows you to freely touch the liquid while not letting it flow.

I decided to record my experiment and publish it in my instagram stories feed and got some negative and perturbed comment about it as “yuck” but it kept the audience to be interested why i did it and “what a heel is going on with my study”. Combing this particular experiment with the statement from the book “Great Expectorations: The Cultural History of Saliva from Jesus Christ to Iggy Pop” I can conclude that normalisation of salivary exchange should be the part of my chosen research representation. Because the audience hearing the topic of the research more likely to consider it guided by fear to be infected rather than to be beneficial from kissing as it was discovered in the research. This concept give me a possibility to see my goal of data representation based not on the problem solving design and functionality but to discover it in the context of speculation design. It helped me think about experience of being involved into intimate process - kiss, and new ways to understand of intimacy and publicity in the non-place. To think about the difference in experience of people seeing kiss on the street and reading about it in Twitter.

The last proposition I did was some technology which can be used in future. It was represented by a litmus test for a best partner based on the mouth microbiota composition of potential partners. It is like a piece of paper showing compatibility of partner’s oral microbiota by color. By this idea I wanted to dream about the ways of application the oral microbiota study in terms of social needs and to show some beneficial effect of it to people’s everyday life. The purpose of this project should be to simplify a searching process of romantic partner in future as an analog of dating services. It do not describe directly the research, but to speculate with the future consequences of researches in this topic and question our perception of bacteria like separated from us microorganisms, despite scientific opinion - to count it as a part of human body. This idea was not finished because my reflection about these concepts changed my direction in the general vision of the research’s communication. But each of these concepts was kept in my mind and directe me in my final project.

I moved from reality of kissing into rethinking of its simulation in digital. And it starts from the the data which I get until paradoxical absence of bacteria in digital space at the end. Thinking about privacy of data today I see some necessary to spoke about experience of being involved into intimate process and new ways to understand intimacy or romance in social media. That is why i would like to narrow the *audience* down to younger generation who was influenced by social media more in terms of romantic communication based on the article published in "The Atlantic" magazine[36].

Following the research I decided to recreate the experiment by using data from Twitter as an analog to self-reported kiss frequencies used in research "Shaping the oral microbiota through intimate kissing". In this case I'm moving the experiment from laboratory to the space of gallery and simulate it in real time by creating an immersive installation named 'Serenade'. The reason why I would like to use immersive installation is my tension to involve the viewer into the feed of tweets and data about kissing experience of other people from the different countries. To create a tension, atmosphere of voyeurism experimenting with a term of intimacy and how it changes online by using 'data dramatisation' method. It is mixing the role of viewer, Twitter user and scientist in one experiment.

Serenade is an algorithm that turns data about kissing, exported from Twitter, into a playful sensory experience. I would like to use different ways of perception – sound, sight and smell – with a goal to communicate the research and represent its results:

The data from Twitter will be converted into romantic musical composition. Collaborating with a developer I plane to create a program, which will take data from Twitter by keywords: kiss, kissing, muah, xoxo in live stream (Kiss - represent the sence, kissing - process, muah - sound, xoxo - social media equivalent of kiss and houg). Each these keywords will be played as note composing a melody and lyrics. The lyrics created by randomly chosen tweets will be signed by Siri (Siri – it is is an intelligent personal assistant inserted into iOS software). The duration of the song and the number of the tweets will be counted by the amount of hypothetically transferred bacteria – 80 million bacteria per intimate kiss of 10s. Thus the sound will be responsible for representation bacteria transferred based on the scientific results.

The next part of the research – similarity of the oral microbiota supported by kissing - will be visualised. From the technical side I would like to use light-emitting diode – LED.

[36] Jean M. Twenge "Have Smartphones Destroyed a Generation?", in: The Atlantic. https://www.theatlantic.com/magazine/archive/2017/09/has-the-smartphone-destroyed-a-generation/534198/. [online], 2017, Accessed 26 Feb. 2018.

LEDs have a possibility to be programed and I would like to connect the colour of the diodes with Twitter stream similar to the previous example. But changing the output. In this case it will be the light which colour the space of the installation. Keywords will have proper bright colour (as red, blue, green and purple - not common in nature colours) and each tweets with these keywords will be slightly changed into the one common natural colour (for this final colour I was guided by metaphor of the colours which is possible to see kissing with closed eyes through the eyelids). As a result each tweet will transform the multicolour contrast lightning of the space into one natural colour representing increase of microbiota similarity.

For creation of more intimate atmosphere in the space I have decided to use smoke machine. It will help to add tactile experience into installation and will make the colors stronger. Moreover fume produced by this mashing can smell adding an additional way of perception. But it is impossible to recreate a smell which will represent unified perfume of kiss. This term very specific for each person. In these case the best way is to use the viewers imagination and effect of placebo by creating and speculating an idea of the specific smell to open the viewers imagination.

CONCLUSION

Problem solving vision of communication strategy for the research: “Shaping the oral microbiota through intimate kissing” seems to be insecure position. Because the data visualisation can not replace the research itself. The key areas of reform are: the increase of emotional connection, actualisation of ethical issues evoked in the research and catalyzation of the interest to continue discover the topic rather then the presentation of the numbers. This management propositions should be applied to design and do not interfere with the scientific research. Because it will help to prevent desinformation and keep the value of the study.

My design decision was based of the hypothesis that public communication of the research: “Shaping the oral microbiota through intimate kissing” can inform about ethical issues and emphasize on explanatory methods of the research through dramatisation rather than represent numbers and results literally. But It must be remembered that this analysis is limited by one example of the research. And an evaluation can only occur with the usage of other resources such as the surveys (which help to collect the data about audience reactions) and comparison with alternative communication strategies. Only after this actions could be possible to appreciate the research’s current situation and possible further development.

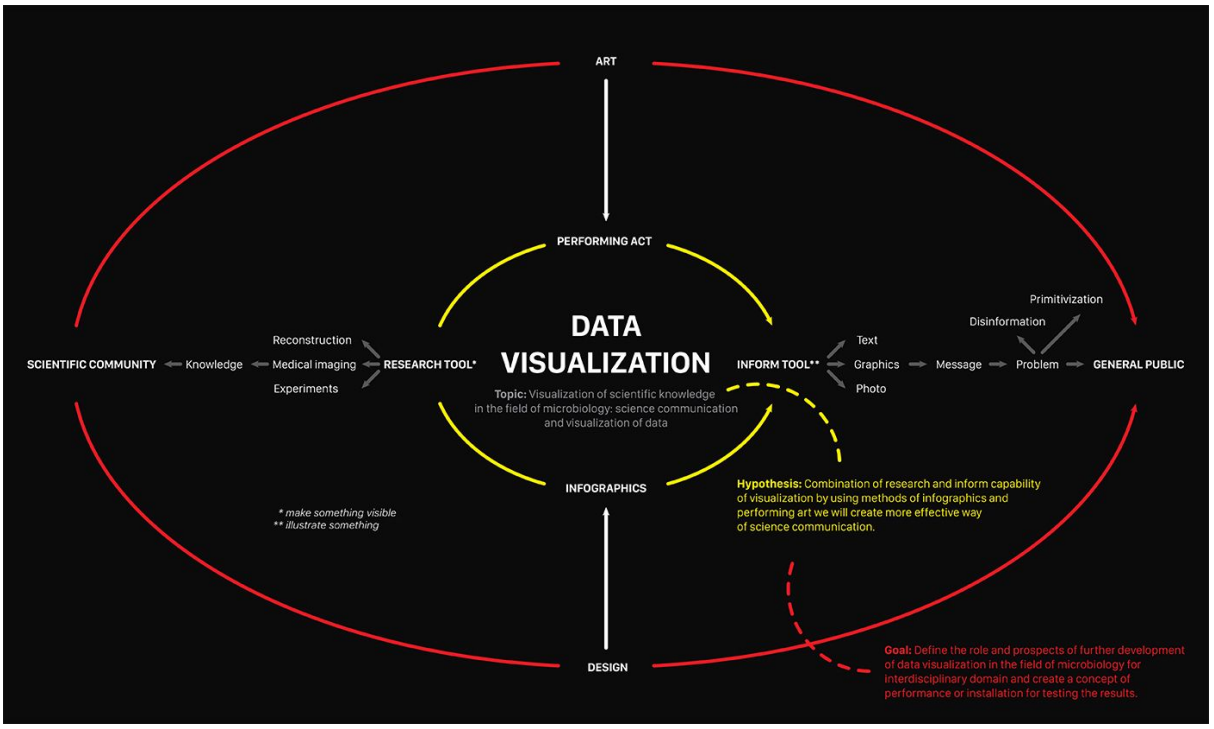
The concept of immersive installation based of the data dramatisation methodology satisfies all of the limitations described in the first and second chapters. This concept describes a new vision of data visualisation and infographics beyond its functionality and problem solving direction. This makes it a reasonable solution which successfully realise the purpose of the work: to propose an alternative strategy for representation of the research “Shaping the oral microbiota through intimate kissing” which will catalyze an emotional response of audience. As it was written before this emotional response needs to actualise the ethical problems and to interest general public in discovery of the topic. At this point the communication strategy has prospects in design of kiss simulation and it will be the direction of its future implementation.

SUMMARY

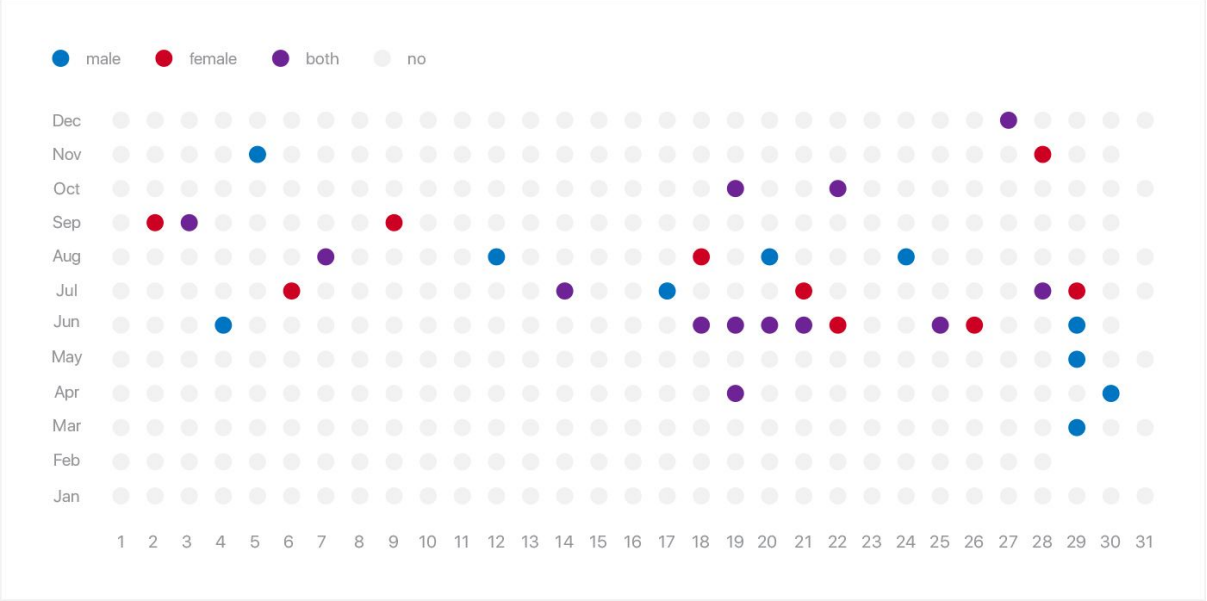
In development of the thesis was provided few creative experiment with microbiology of kissing with the purpose to catalyze an emotional reaction of the viewer based on the theoretical ideas of 'embodiment', 'speculative design' and 'data dramatisation'. *Object* and *subject* are data visualisation in terms of science communication and research: "Shaping the oral microbiota through intimate kissing" by Kort R., Caspers M., Graaf A., Egmond W., Keijser B. and Roeselers G. respectively. *Hypothesis* is that public communication of the research can inform about ethical issues and emphasize on explanatory methods of the research through dramatisation rather than represent numbers and results literally. *Purpose* - to design a way for representation of the research "Shaping the oral microbiota through intimate kissing" which will catalyze an emotional reaction of the viewer. *Objectives* are: to analyse the current image of bacteria and saliva exchange in scientific, cultural, digital contexts; to study and identify the problems existing solutions in data visualisation; to highlight the perspectives in visualisation; to propose an idea for representation.

This ideas describe a new vision of data visualisation and infographics beyond its functionality and problem solving direction, namely: *Embodiment* ideas of data representation directed to rise the emotional experience in term of sensual perception. *Speculative* design theory invokes to question the limited range of the reality and to create an alternative reality examining the future peoples needs. Taking into account these two theoretical methods I'm proposed the immersive installation which consists of three sources of communication: sound, sight and smell – with a goal to communicate the research and represent its results. These three components aimed to create an alternative world of the research by recreating the experiment where the people from Twitter participating. Music, lightning, smoke as the attribute of nightlife metaphorically referring to the karaoke and the feeling of romantic nostalgy processing by internet reality. By taking the people's twitter experience and implementing it in terms of bacteria transfer it will be possible to count and present the data for the public dramatic way. Scientific and social context described in the first chapter served as a basis for design of emotive response in terms of normalisation of salivary exchange. *Data dramatisation* in this case aimed to help to understand the processes that gave rise to the data and the events and relationships within what corresponds to the purpose of the thesis.

ATTACHMENTS



[img. 3.1]



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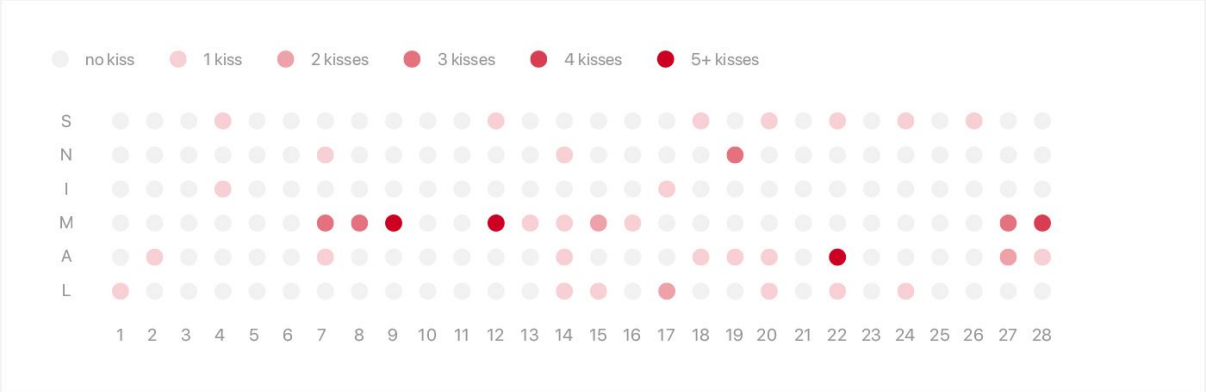
no kiss
1 kiss
2 kisses
3 kisses
4 kisses
5+ kisses
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1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28

[img. 3.3]


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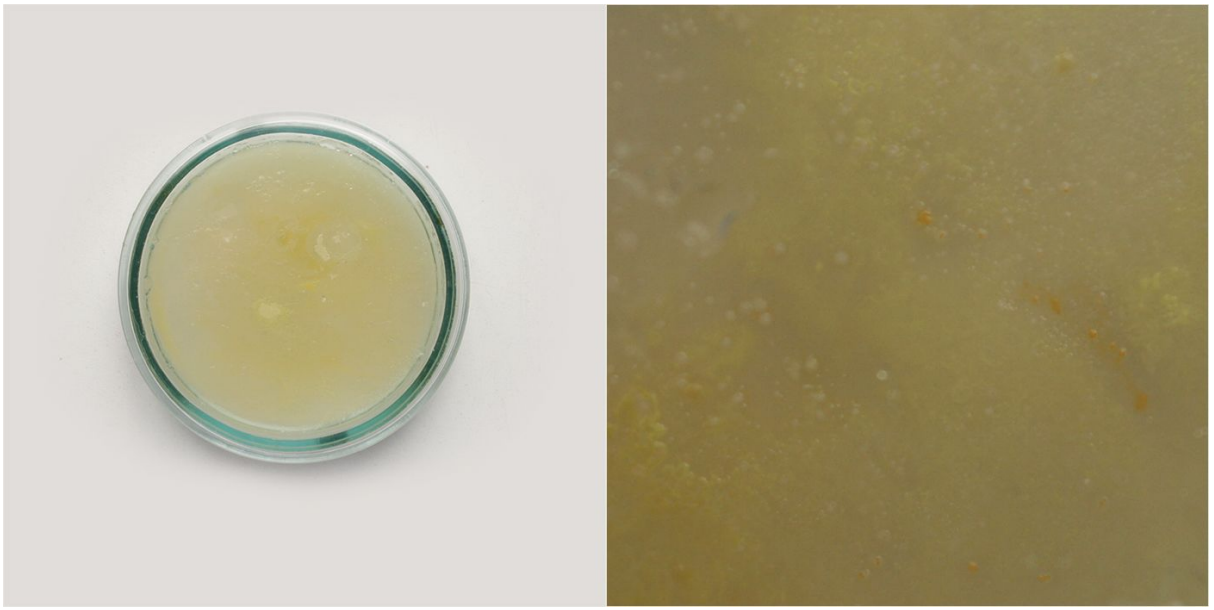
[img. 3.4]



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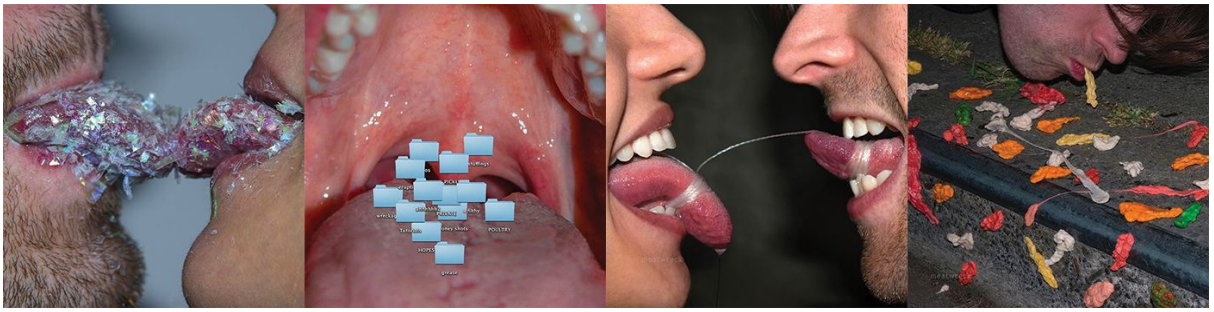

[img. 3.6]

[img. 3.7]

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