Artificial Intelligence implications for VJing

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Abstract

Advancements in artificial intelligence have seen a rapid increase in recent years and are inevitably affecting various fields, sometimes even sparking discussions regarding it taking over human jobs. For me, coming from a VJ background, naturally, the question arose how AI could be implemented in VJing and how would this implementation affect the role of human VJs. The paper consists of two parts – in the review part, a theoretical background is laid out, followed by examples of AI applications currently used in VJing, while for the empirical part, series of interviews were conducted with nine VJs working within different domains, about their practice, experience, and expectations regarding the involvement of AI in the field. The qualitative analysis of data reveals certain patterns that could have implications for those developing new VJ applications, as well as researchers and artists working in related domains.

Keywords: Audio-visual performance, Projection, Artificial Intelligence

1. INTRODUCTION

Artificial intelligence (AI) has been around for a long time, however the current renaissance started only around 2012 due to advancements in machine learning techniques and access to large amounts of data [Tan, 2018]. Artistic use of AI is also by no means a new practice and implementations in music composition, fine arts and literature are generally studied. In 2018 an AI generated artwork even fetched a record price of over 430,000 dollars at an auction [Christie's, 2018]. Even though it is usually driven by hype, undeniably artificial intelligence is putting down its roots deeper into the artistic world. In this thesis I approach a rather novel interdisciplinary field merging real time visual performance (or VJing) and AI. In recent years this field was explored by a handful of artists in their creative practices and exhibited in various festivals. Therefore it is plausible that in a foreseeable future more creators and technicians working within the field of VJing might start employing AI. However the academic world is lacking any research combining the disciplines of AI and VJing into one project, so hopefully this paper will help to form a framework for possible applications of AI in VJing or related domains that could be of interest for artists, technicians, researchers and developers.

Most papers regarding live visuals, single out a particular domain, e.g. a club [Dekker, 2003] or a jazz concert [Wang et al, 2014], whereas I looked at it from a broader perspective by interviewing VJs working in domains such as theaters, TV broadcasting, clubs, festivals etc. The qualitative analysis of data reveals certain patterns that could be useful for those developing new VJ applications, as well as researchers and artists working in related domains. Coming from a VJ background myself, I do not go

very deep into technical details, but rather focus on creative and affective properties.

This paper consists of two main parts – review and empirical - that aim to answer the research question - *how would VJs benefit from AI implementation in the field?* In the review part, a theoretical background is laid out including a brief history of VJing and classification of VJ methods, followed by AI in VJing, the real world AI VJ examples and AI as an artist. For the empirical part, series of interviews were conducted with nine VJs working within different domains about their practice, experience, and expectations regarding the involvement of AI in the VJ world. This second part consists of three subsections: challenges, methodology and analysis.

2. REVIEW

In this section a theoretical background behind VJing is presented. It includes five subsections on history, classification of VJ methods, AI in VJing and real world AI VJ examples, as well as an overview of artistic abilities of AI. It is worth mentioning that due to challenges concerning coming up with the methodology for empirical research, this section was initially considered to be the main part of the whole thesis, however, eventually the empirical part increased in volume, making both parts equally important.

2.1. Brief overview of VJing

Video Jockey, more commonly known by the acronym VJ is a relatively new term that encompasses a broad range of real-time visual performers. In one of the key books on VJ culture, *VJ: audio-visual art and VJ culture*, published in 2006 and edited by Faulkner [Faulkner, 2006], Crevits [Crevits, 2006] traces the phenomenon of VJing, as we know it today, back to clubs in New York City in the 1970s and attributes it to the emergence of house music, when absence of stage performance created a demand for new visual experience. The term itself was introduced by MTV to describe their presenters, but soon was taken over by the people in charge of the visuals accompanying music in the club scene.

Dekker [Dekker, 2003], looks for origins of VJing (or synaesthetic performance, as she tends to call it) as far back as the Renaissance and she attributes such scientific and cultural advancements as camera obscura, panorama, diorama, magic lantern and Gesamtkunstwerk theatre as early predecessors of current day VJing practice. Undoubtedly, the main invention that paved the way for further developments was film. And although many abstract works by early experimental filmmakers, such as Hans Richter [Richter, 1921], Walther Ruttmann [Ruttmann, 1924] or Len Lye [Lye, 1935], carry apparent resemblance to contemporary VJ culture, however they are lacking the performative aspect, that is crucial to VJing. This means that VJing could be classified as an expressive combination of performance art and video art. The first occurrence that truly resembled VJing, happened in 1966 and was initiated by Andy Warhol. It was a series of multimedia events called Exploding Plastic Inevitable [Warhol, 1966] and intended to promote the newly formed band Velvet Underground and Nico in venues throughout the United States, where musical performance was accompanied by a light show and film projections.

To this day, the most important task of the VJ is merging the visuals to the sound, but equally important is the collaboration between the VJ and the light technician, or light jockey (LJ) in order to form a perfect 'symbiosis' of lights and visuals. Next to that, lasers, smoke and sometimes even smell could be used to maximize the experience for the crowd. The way how each individual of the audience perceives it, requires a whole new topic, where, besides other things, personal taste, alcohol and drug consumption should be taken into consideration.

2.2. Classification of VJ methods

VJing could be classified into several different styles and techniques. Two fundamental categories are defined by the medium: analog or digital. Although analog is still practiced by some VJs, it could be considered niche or even obsolete, therefore the following subsections draw more focus on currently widely used digital VJing methods which also include AI.

2.2.1. Analog

Despite currently being niche, analog VJing is nevertheless an integral part of VJ culture and who knows, maybe someday we will face an analog VJ revival, similar to the revival of vinyl records in the past decade.

The most basic and analog form is a shadowplay, which requires only a source of directional light, a screen and anything in between to drop a shadow. Using an overhead projector is a bit more sophisticated, it requires transparent slides with either drawings or anything on them. Use of colorful liquid renders a particularly interesting result [White, 1969]. Another analog approach is animations created by objects, spinning at particular frequency, for instance, drawings placed on a spinning turntable, filmed and streamed live [GO GAGA, 2010], or a slowly spinning bottle with liquid placed in front of a directional light, creating organic visuals. An analog projector could also be implemented for VJing. If two or more projectors are modified and the same film is fed to them, interesting effects could be achieved. The same is true with VHS or other magnetic tapes and hardware hacking or circuit bending. Altering or removing the tape heads from the player, enables one to make a rough video sampling machine. However, equipment for screening analog film or video is inherently bulky therefore VJs wishing to use analog footage nowadays tend to use digitized version of it and screen it using their laptop computers.

2.2.2. Digital

Opposite to the analog techniques, anything made by a computer falls under this category which is currently most prevalent among VJs. There is, however, an intersection between analog and digital, where analog qualities are being mimicked by means of digital filters and effects, owing to the peculiar charm of obsolete mediums.

Interesting digital visuals are achieved by using a video synthesizer (or several of them) connected into a feedback loop [Guhl, 2015], where the output of one machine is fed as an input to another. However nowadays the most commonly used VJing technique is using a special software installed on the computer to playback, manipulate and apply effects on the video samples. Some VJs shoot their own material with cameras, others make their own graphics or animations, many different sample/loop packs are available for downloading, usually for a fee. More recent versions of VJ software allow users to playback interactive or audio-reactive files, made in a variety of visual programming languages e.g. Quartz Composer or TouchDesigner. Some more technically skilled performers generate visuals (sometimes together with music) entirely in real time using live coding techniques.

VJs working at events with higher production value, such as live concerts, often use timecode for seamless audio-visual synchronization, however such method requires thorough preparation of video material and only allows minimal real time adjustments by the VJ. Since tasks such as this do not require much labor from the human operator and are successfully done by a computer, possibly artificial intelligence could be employed to take over even more tasks from the VJ. In theory, AI in VJing could be classified as an extension of digital category, however it deserves a whole separate section in the context of this paper.

2.3. Artificial intelligence in VJing

Most recently, artificial intelligence is being employed to produce or experiment with the visuals. In most cases, a pre-rendered set of images is being put together using a process called latent space interpolation which gives the video a smooth morphing appearance [Karras, 2017][Swaffield, 2018]. Such imagery is being generated by using networks such as generative adversarial network (GAN) [Goodfellow, 2014], trained on various datasets. This method is unfortunately slow and requires high processing power if the output is to be detailed and realistic.

In recent years several papers were published on implementing AI in generating dynamic videos from a single static image [Vondrick, 2016] or text input [Li, 2018]. The results produced are visually interesting, unfortunately at very low resolution (64x64) and short in duration (less than 1 or 2 seconds). The resolution and the frame rate could be made higher, however it would exponentially increase the processing time in turn. Another fundamental issue of images generated by GANs is the square aspect ratio, which is unfavorable for the VJ. It is caused by the network architecture of most GANs and possible solution to this problem could be either cropping the generated image or a GAN with novel architecture, capable of generating images at different resolutions, such as RectGAN [Deng, 2019].

Some networks are made capable of generating visuals real-time, most notably Music2Art [Elgammal, 2018]. However, the pace of such visuals seems slow while the aesthetic properties are very abstract and uninteresting at times. Unpredictability of the output of such networks is noted as well. The good news for VJs however are that, while most scientists focus on creating life-like scenes or actions and discard the failed results, video material intended for use in VJing does not inherently have to be realistic, rather it could be completely experimental and even the failed attempts could prove aesthetically interesting for certain applications.

Other possible uses could employ computer vision for various pattern recognition experiments or machine learning for training agents or particle systems within 3D or game development platforms, which in turn would appear on the screen as part of the visuals, as illustrated in the next section.

2.4. Real world AI VJ examples

During the 2019 edition of Rewire festival, which took place from 29th till 31st of March in The Hague, two performances included human-AI collaboration. British electronic musician Darren J. Cunningham, known by alias Actress, developed an AI character named 'Young Paint', which spent considerable amount of time learning from the dataset of previous compositions produced by its creator. The show consisted of Actress standing next to the projection of Young Paint and performing as a duo (Fig. 1a). In another performance, artist Ash Koosha presented his AI creation, trained on human behavior, named Yona (Fig. 1b), while the artist himself was not present on stage, only the image of a human-like figure was projected on screen dancing and singing. In cases of both Actress and Ash Koosha, however the character on the screen was a man made 3D agent with certain AI-generated variables applied in real time that made it move or sing [Aimee, 2018]. Both performances were imitating human features and without prior knowledge, spectators probably would not be able to tell that AI was involved. In contrast, visuals that accompanied the performance of Jesse Kanda (Fig. 1c) were looking uncanny, even unearthly, although they were rendered by a human artist. This brings a paradox, where AI generated visuals look more humane than those generated by a human. This is however only an isolated case and does not necessarily apply universally, but it raises an interesting question whether AI artist would still try to mimic humans if it became autonomous?
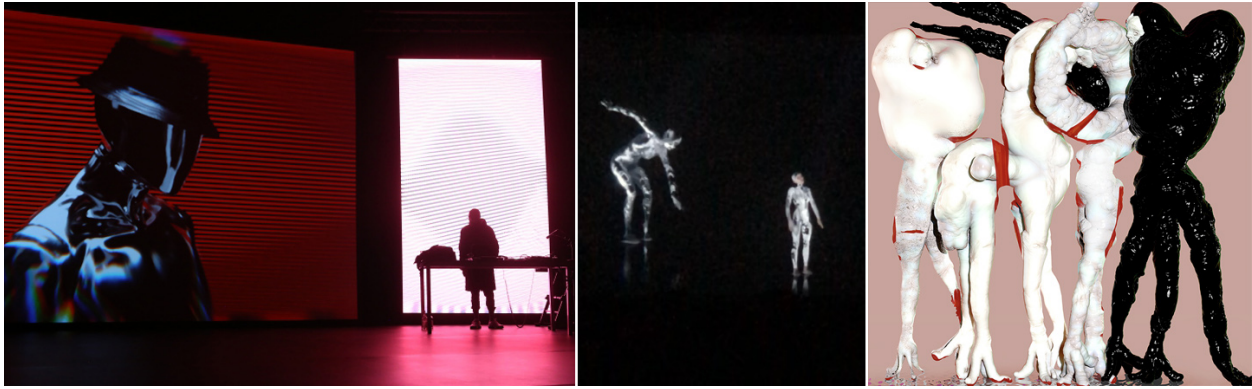
Figure 1. Left to right: (a) Actress and Young Paint, (b) Yona by Ash Koosha,
(c) Blindspot by Jesse Kanda

2.5. AI as an artist

Since the emergence of computers, both art historians and scientists were addressing the fundamental question whether artifacts generated by an algorithm could be labeled as art. In 1971 computer art pioneer Frieder Nake disregarded computer art as such and proposed that computer creativity should not be even considered a serious question [Nake, 1971]. Twenty years ago concepts, such as "carbon fascism" (the bias that only biological creativity can produce valuable artifacts) [Bedworth 1999] emerged and, for the most part, computer-generated artifacts were not taken seriously by experts. Nowadays situation tends to shift, Smith and Leymarie suggest that at present we can begin to think of the machine, not as the artist's subject matter or medium, but as creator or co-creator [Smith & Leymarie, 2017].

Elgammal et al. proposed a more creative update to Generative Adversarial Network (GAN) which they called Creative Adversarial Network (CAN). According to authors, it shifted from being emulative to being creative. It was specifically designed to generate art that does not follow established art movements or styles but instead tries to generate art that maximally confuses human viewers as to which style it belongs to. The art generated by their system was examined and validated in four experiments by human subjects and in some cases even rated higher than human produced art [Elgammal, 2017]. This of course does not unambiguously mean that AI is or will be creative enough to take over jobs of VJs or creatives from other fields, however it certainly raises interesting questions about the future which will be addressed in the empirical study.

3. EMPIRICAL STUDY

Empirical research on the topic proved to be a challenging task. At one point, after examining many possible scientific methods and not finding a suitable one, the change of topic was even considered. Luckily, eventually a method was found and research implemented. Challenges, method and analysis are presented as three subsections describing the empirical study.

3.1. Challenges

The main challenge in finding a suitable research method was the fact of VJing being somewhat ill-defined. Even though there are different styles or techniques, such as generative, pre-rendered, found footage, animation, etc, but unlike music, literature or cinema which all could be categorized into genres, VJing has no defined limitations and many VJs tend to merge various techniques together in their practice. This taken into consideration, quantitative research approach was renounced as it

would be almost impossible to measure any meaningful numerical data within the domain.

Nevertheless, several approaches towards empirical study were examined. At first, evaluating the affective and aesthetic properties and measuring the emotional responses to visuals generated by AI was considered. This approach was based on experimental aesthetics theory, laid out by Berlyne [Berlyne, 1971], who stated that novel stimulus is enjoyable only to a certain point, but when the stimulus becomes too complex, it is judged unpleasant, as illustrated by the Wundt curve (Fig. 2). However, Silvia later discharged Berlyne's theory as inaccurate to research emotional responses to art, stating that the effects of events on emotions do not stem from objective qualities of the events but from subjective interpretations of the events, therefore interest and enjoyment follow different curves [Silvia, 2005]. Eventually this method was dismissed as it would prove to be too biased. Later a research by design approach was discussed which aimed at designing a novel system e.g. by combining several neural networks, that could be capable of generating novel artifacts and reflecting back on the design process. However this approach was discarded as well, considering time constraints and technical requirements.
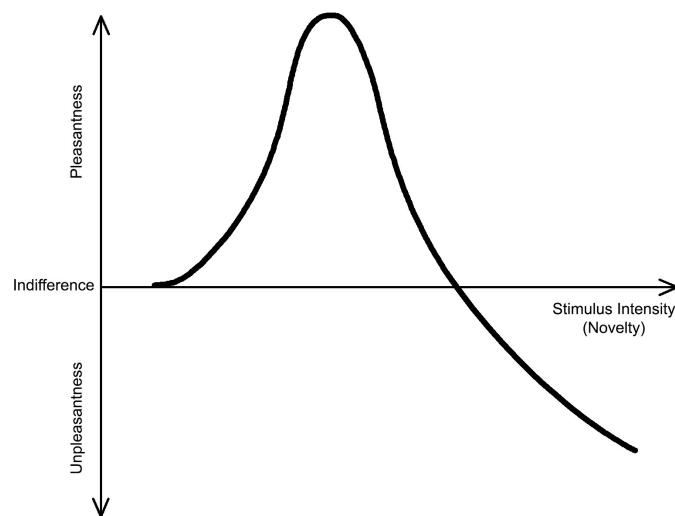
Figure 2. The Wundt curve

3.2. Method

Since aforementioned methods turned out to be limited to answer my research question - *how would VJs benefit from AI implementation in the field? -* open interviews with professionals was chosen as the most suitable method and will be elaborated upon in this section. Even though this qualitative method might not be the best approach to deliver generalizations, it could provide insights into patterns, mindsets, and expectations of professionals in the field.

During the design phase of the interview, it was decided that verbal conversation would be more appropriate form rather than written questionnaires. This allows to tailor certain questions specifically to the knowledge and experience of the interviewee, considering the fact that some of them might have no experience or understanding about AI and therefore would need extra guidance or visual input, while others might have a certain expertise in the field. Verbal interviews also provide some level of freedom to deviate from the pre-planned questions, based on the previous answers and allow more space for discussion.

The questions were structured using a bottom-up approach, so by starting with introduction and providing some examples, it goes up to hypothetical scenarios and even utopian ideas. Open

questions of the interview were intended to trigger a discussion and sometimes provoke new questions, therefore the method of the interview could be classified as semi structured. A test interview was conducted to examine various questions and based on the outcome of it, the final structure including 21 questions was made (Appendix 1).

When choosing the respondents, my personal network was leveraged. In total, fifteen VJs were reached out to and considered. These were the professional peers I met during my own VJ career spanning over 10 years. Even though most of them responded positively to the initial inquiry, during the planning stage, some had to be cancelled due to conflicting schedules and eventually 9 subjects were interviewed. All respondents had at least 4 years of VJing experience and worked in different domains: parties, music and art festivals, conferences, theatres, TV shows and corporate events. To avoid gender bias, the group consist of 4 females and 5 males. Five of the respondents were met in person and the remaining 4 were interviewed through a video call using Jitsi [Jitsi] as a platform. Since me and 5 of the respondents shared Lithuanian as their mother tongue, the questionnaire was translated and interviews with them were conducted in Lithuanian. The other 4 were done in English. Meta-data and background information of all 9 interviewees are presented in Table 1 and Table 2 respectively. For the sake of clarity in further writing, interviewees will be referred to as *subject n,* or as a set of numbers in curly brackets *{n1, n2, n3}*, where *n* is the interviewee number.

No.	Name	Gender	Date	Language	Duration	Location	Medium
1	Darien Brito	male	24-07-2019	English	15m32s	Den Haag, NL	live
2	Vytas Realtime	male	07-08-2019	Lithuanian	27m51s	Vilnius, LT	jitsi
3	VJ Crystal	female	08-08-2019	English	44m53s	Den Haag, NL	jitsi
4	Tomas Stonys	male	08-08-2019	Lithuanian	18m15s	Vilnius, LT	live
5	Oskaras Gudas	male	08-08-2019	Lithuanian	20m42s	Vilnius, LT	live
6	Irina Spicaka	female	09-08-2019	English	30m52s	Berlin, DE	jitsi
7	Rimas Sakalauskas	male	13-08-2019	Lithuanian	34m31s	Vilnius, LT	live
8	Barbora	female	14-08-2019	Lithuanian	19m31s	Vilnius, LT	live
9	Carolien (Deframe)	female	14-08-2019	English	21m07s	Utrecht, NL	jitsi

Table 1. Interviews' meta-data

No.	Name	VJ experience	VJ frequency	Domain	VJ style	Experience with AI
1	Darien Brito	6 years	Once in 3 months	Art festivals, AV performances	Real-time algorithmic	Advanced, working with CNN and other networks
2	Vytas Realtime	15 years	Once or twice a month	Parties, theatre	Real-time, generative graphics	None, general knowledge
3	VJ Crystal	4 years	Monthly	Parties	Self made animations, pre-rendered	Some experience in training 3D agents
4	Tomas Stonys	4 years	Every 2-3 days during the season	Corporate, TV shows, parties and music festivals	For commercial events – material prepared by animators, for parties – own generative and interactive visuals	None, general knowledge

5	Oskaras Gudas	10 years	Monthly	Corporate events, concerts, TV shows, theatre	For commercial events – material prepared by animators, for other events – various techniques combined	None, general knowledge
6	Irina Spicaka	16 years	Not active in VJing anymore	Currently – AV installations, formerly – parties. UX/UI designer	Both pre-rendered and generative visuals	Working with computer vision
7	Rimas Sakalauskas	7 years	Once in few months	Theater and concerts	Self made 3D renders, and bit of video footage	Basic, working with AI powered plug-ins
8	Barbora	5 years	3 - 12 events a month	Concerts and conferences	Animations, stock footage and video loops, self made 3d material.	None
9	Carolien (Deframe)	10 years	Twice a month as a collective, once in a few months herself	Techno parties, clubs and music festivals	Some generative stuff and pre-rendered loops of different media	Some experience in installation set-up

Table 2. Respondents' backgrounds

Interview sessions were recorded using Voice Memos app on iPhone 7 and produced a data set consisting of almost 4 hours of audio recordings. After manual transcription and translation into English (Appendix 3), a Thematic Analysis was applied following the guidelines proposed by Braun and Clarke [Braun, 2006]. Inductive rather than theoretical Thematic Analysis method was followed, therefore the coding and categorization was not guided by pre-determined theoretical frameworks or hypotheses, but rather was an exploratory process. The data set was first systematically coded highlighting all interesting features. Following this, all data relevant to each code was iteratively collated which produced 37 potential themes. The themes were then analyzed and refined into seven thematic categories in relation to the coded data and the entire dataset. With name and definition generated for each of the themes, overall story of the analysis, relating back to the research question, was made.

3.3. Analysis

Some of the themes below arose from rather direct responses to certain questions, while others emerged as a pattern from answers to more open questions that were usually followed by a brief discussion. Due to space limitations, uninteresting data was dismissed and only brief analysis and quotations of the themes that are the most relevant are presented below. It should provide sufficient insight into how AI implementation in VJing would be seen by VJs and whether or not they would benefit from it.

3.3.1. Positioning the VJ within art and technology

The first theme that emerged and separated the subjects into three equal groups was regarding where between art and technology the respondent sees him or herself. Some subjects expressed the preference to be considered as artists:

> - *Sometimes we are booked as artists, other times as technicians. We like to see ourselves as artists, but outside world sees us as technician {9}*

> - *Smaller VJs are usually more about the idea and concept rather than technical things. {3}*

8

- I think it is more of an art form, but very highly influenced by technology. {2}

Meanwhile the others stressed about VJing being inherently technical rather than artistic:

- I think it is more technical, because one cannot invest a lot of time in VJing, it is evaluated by parts of second. Just like we expect a good sound in the venue, we also expect good visuals as a whole. {7}

- I would say it is more a technical speciality, because if the video files for the show are prepared well, anyone can play them, even machine on its own. {8}

- I think it is a technical speciality as for now but in the future it will become more of an art form. For now you need more technical skills rather than art skills to be a VJ. In events market it all comes down to technical skills, because it is cheaper and more effective to hire a technically skilled person rather than an artist. {4}

The third group finds both artistic and technical skills inseparable in VJ practice:

- There are too many things to consider to clearly say if it is artistic or technological. {1}

- My practice is somewhere in between plus the third part – design. I take it from three sides. {6}

- I think it can be as much a form of art as a technical speciality. On one hand there are artists who make art and transmit certain messages or create the added value through their visuals, while on the other hand there are VJs who do completely technical job. {5}

It is worth noting, that two subjects {4, 8} from the technical group work as VJs for a living and mostly work for TV shows, concerts, corporate and other commercial events that usually demand more technical skills than e.g. techno parties. While for other subjects VJing is more of a part time job.

3.3.2. Human role in VJing

Interestingly enough, it was agreed by all subjects that inside the venue, be it a club or an arena, a VJ is not being noticed or paid attention to by the crowd most of the time. Some of them even went as far as stating that human presence is meaningless or not important at all and that they rather had a machine working for them:

- One only notices a VJ when he messes up. {9}

- Out of the whole arena only one or two people might notice that. {8}

- I find it meaningless to be present at the party the whole night. Maybe at the beginning of the party VJ presence is still important, but not so much at 3am. {7}

- I think it is very good if software can run and I don't even have to be there. {6}

- I think human element in performances of electronics is a bit overrated. I think the beauty of electronics is that you have machines that can do things that we can't. So why try to humanize things that are inherently electronic. I think it is an advantage to use and I am not so excited to see a guy moving knobs. I don't like to be exposed as a performer and I think it is not really important. {1}

The aforementioned sense of meaninglessness along with several other factors even made some of the subjects step away from active VJing after their long-time careers:

- I try to move from VJing because of having to stand there all night, getting small payment and people not appreciating your work very much {9}

- Now I do not really VJ because I find it time wasting. Also I can see how it is right now in Berlin where we have some visual artists who try to do VJing but it is very hard for them because there is no money. {6}

Two subjects pointed out that in bigger events they often use timecode for synchronizing visuals

with the action happening on stage, which almost eliminates the need for human VJ presence during the show, therefore the task of the VJ becomes creation of the visuals, rather than real-time performance:

> *- Some performances are using timecode and the performer simply sings along the playback. In this case the human touch is not so important {8}*

> *- It is already happening now that machine is working on it's own, for instance in shows that use timecode, where all the show is pre-planned second by second and VJ as such is not even necessary during the show. In this case, the task of the VJ is only to create the visuals and prepare them for the show. {5}*

3.3.3. AI as a possible threat for VJ

The previous two themes looked at VJing from a human perspective. For the following themes, AI will be introduced and the focus shifts to more hypothetical scenarios. First of all, subjects were asked whether they would feel threatened by AI being introduced in VJing and becoming a better VJ than themselves. Interestingly, three respondents expressed positive emotions for such scenario:

> *- It would be amazing if it became better performer than me, because I could just stay still and do nothing – thats is a dream of my retirement. {6}*

> *- I would be happy if it would be better VJ than me, as it would save my time and I could work on other things. {5}*

> *- I have no worries that machine will take over my work – I don't care and I would be very happy if it takes the boring part out of it. AI is interesting at the moment not because of what it can do but because of what it can show you about yourself. We do a lot of things that we do not notice, like patterns and the computers can know us better than we know ourselves in some ways. {1}*

Responses of the other subjects, although not being particularly negative, contained more skepticism and some even a possible hint of fear:

> *- I wouldn't feel threatened by it, maybe just a little [...] Although if VJs get automated, why not DJs, do we still need clubs then? {9}*

> *- I would definitely not feel redundant and would find some other activities for myself. It is most important to not fall behind the needs of the market [...] If our function is not necessary, there will be other functions where we will be needed [...] Even if it would make better visuals than I do, I believe it would still be my intellectual property. {8}*

> *- I think even now there are a lot of people who could do the same work better than me and cheaper. But humans have a tendency for liking certain brands and names [...] So I do not feel threatened by AI. Because people for whom I work trust me and hire me. There are both social and psychological aspects influencing this trust. {7}*

> *- Why would someone hire me for making the visuals if there was a tool that could make it. I would naturally feel the threat. But there are some good points to it, I think AI would make some new gaps on the market that would have to be filled in by humans. {4}*

> *- I don't think it would become better than me yet. I am not worried because still there is always somebody who needs to program the AI. Maybe singularity is not going to happen, because humans want control over everything. {3}*

> *- I would not feel the threat of it becoming better than me. I have no doubt it would make some things better than I do, and I think it is exaggerated that AI would steal the VJ jobs. {2}*

It is worth noting that subjects 5 and 6 from the 'happy' group, also stated that they both are (partly) abandoning their VJ careers and moving on to installation/stage design {5} and UX/UI design {6} respectively, therefore presumably they would feel happy because they would not incur any

significant losses in the event of AI becoming a good VJ. On the other hand, subject 1 from the same group has the most advanced experience in AI of all the interviewees, thus possibly he might not consider it as uncertain or threatening as the respondents from the second group, who might be fearful not of the AI per se but of the unknown that would come with it.

3.3.4. AI and VJ symbiosis

Interviewees were presented with three possible scenarios of future VJ software – either completely human controlled on one end, completely AI controlled on the other or a human-AI collaboration in between. Most respondents expressed their preference for the collaborative human-AI application, saying that AI on its own would not prove to be creative enough. This correlates with findings of McCaffrey and Spector who argue that repetitive tasks can be more efficiently handled by AI, while humans are better at creativity, thus human–machine synergy is more innovative than either partner working alone [McCaffrey & Spector, 2018]:

> *- It can help in the creative process by showing different choices, be supportive but not creative. {9}*

> *- I would be very happy if it takes the boring part out of my creative process. {1}*

> *- I think the collaboration between human and AI could prove to be very creative. {5}*

> *- My aim would be to find a way to be able to collaborate with AI. I think it would be great if AI could make a half of certain tasks, while I could combine it all and do the rest of the job. {4}*

> *- As a human you always want to add your own value to things and have control. {3}*

> *- I think the most interesting would be a collaboration with AI, so it would be a sort of a VJ partner. I used to work with a partner a lot before and often the partner has a completely different approach to certain things and they sometimes become a source of inspiration to yourself. And as for AI it depends on how would it be trained. If it was trained on my own style, it would not be so interesting to collaborate. {2}*

Even though the majority of subjects suggested that AI is considered not creative enough to be an autonomous VJ, a few possible applications for that were expressed as well:

> *- I think the market for AI generated visuals would be in smaller clubs and parties, where visuals are just some random graphics moving to the rhythm, and they do not carry any meaning or tell any stories. {5}*

> *- If you have to go to the toilet, you could leave it completely for the AI {9}*

Further, two subjects brought up AlphaGO [Silver, 2016] as an example of AI creativity, however while chess or GO playing software can employ combinational and transformational types of creativity and be very novel, creativity involves not only novelty, but also value, which is highly variable therefore almost impossible to program [Boden, 2007]:

> *- So I think AI has the potential of being unpredictable and interesting in chess or GO. However in chess and GO there is a clear goal which has to be achieved, while in creativity or arts it is very hard to formulate the goal, because the process and various social components are equally important as well. {7}*

> *- I think it is very limited at the moment and maybe it reveals a lot of how it works, so they are not yet at a state where you could call them creative. Like for example with AlphaGo, which is the most impressive example. It becomes creative because it comes up with new strategies in the game, but I think with video the thing is that it depends so much on the data that you feed it, it just replicates it. {1}*

3.3.5. Desired features of AI application for VJing

When asked which features would subjects expect from AI to improve their practice, many pointed out better audio-reactive capabilities:

- Audio-reactive feature. {8}

- Automatic synchronization with the music would be another great feature. {7}

- Make it smart enough to trace the vibe of the music, color of the lightning, atmosphere and music style. {9}

Even though most of current VJ software comes equipped with audio-reactive feature, it sometimes tends to be rather unresponsive. Similarly to widely used text prediction tools, music prediction was expressed as one of the desirable features:

- Predict what is coming next in music. {9}

Several video processing aspects were noted as needing a touch of AI:

- Possibility to process live video feed from the camera, applying certain filters and effects. {8}

- I would like it to be able to speed up or slow down the footage flawlessly with filling in the missing frames. {7}

One respondent suggested a creativity training feature, which would allow the software to learn be creative from its users:

- I think it would be quite interesting if there was an AI software that would be able to learn creativity from everyone who is using the software. {2}

This Referential style feature was also proposed:

- Ability to work by reference, so if VJ could upload the reference and the software would automatically apply the styles according to it. {8}

And finally, the most unusual feature proposed was to maximize the club experience by optimizing the projected visuals to the drugs taken by the club-goers:

- I am curious if one could train the AI to detect what kind of drugs people are using in the venue. And then based on that it could choose what kind of visuals would give the audience most pleasure and enjoy the music and atmosphere even more. That would be a very complex thing and I think we are still quite far from achieving this. {2}

Implementing this method to test urine samples from the toilets in real time would undoubtedly be an interesting project.

3.3.6. Influence of the audience on the visuals

The idea about the audience controlling or influencing the visuals was mentioned by several respondents. Similar topics have been promoted and researched before [Kaiser et al., 2007], [Freeman, 2013], however, among interviewees it created conflicting views. Only one respondent expressed the necessity for such option:

- I feel we are lacking some options of reality scanning. For instance, to scan the movement of the audience and use it to control certain parameters. Would be great if AI could help us come closer to reality and exploit the space better for the performance. The approach should be not invasive for the privacy of the audience. {4}

Meanwhile the others were more skeptical, pointing out concerns for privacy of the audience or stating that visuals should influence the audience and not the other way around:

- I myself try to influence the audience and it is great when they react to what I do. {2}

- When it comes to cameras and computers, as soon as something is being filmed, it doesn't matter if it is not being recorded, I am a bit disturbed and worried about that in general, because it takes away people's freedom and I think that is where AI is on the edge between being super awesome but also dangerous. When you go into a club, you want to get loose and do not want to be bothered that the day after your boss would tell you "oh I saw you had a nice party yesterday", showing you some film on the internet. {3}

- I wouldn't want the audience to influence the visuals, because then the visuals would become the creation of the audience and VJ would become not necessary anymore. It is interesting to know the principles of the audience, but I believe the VJ should provide the rules of the game that should be followed by the audience linearly, not interactively, just like when I come to the concert I do not want to sing there myself, I want to listen to whoever is singing and enjoy it. When I watch a movie I do not want it to change depending on my mood. Or when I read a book, it would be pointless if it would adapt to your mind. It would just create a feedback loop where you would be reading what you want to read and that would simply eliminate any improvement. {7}

3.3.7. Aesthetic properties of AI generated visuals

The final theme revolves around the aesthetic value of AI generated imagery. Trying to not be biased on particular visuals, each respondent was asked to share their impressions about AI generated content from their memories, without providing them any visual input. Several interviewees expressed their affection:

- I think aesthetics classify as contemporary internet glitchy-trashy. I would use it for my work. {7}

- I like the aesthetics very much and for a while now I want to include it for either some party visuals or even make a projection mapping to create some of that unpleasantness because it affects people psychologically a lot and I would love that, but for now I think it is technically too challenging. {4}

- I kind of like it. I like that it is creepy, just because we make AI and it portrays our deepest habits. I think such visuals have interesting value, but as soon as it becomes perfected, it kind of loses its purpose, except for being a handy tool. But as for now it shows us something in between being a human and it has its own character in a way. You don't really know what it is but you recognize it and that is why you feel uncomfortable. {3}

- I like it, it is a little bit like tripping on acid but not very original. It is just too new and people will have to get used to it. {9}

- I find it very interesting. {2}

Meanwhile other respondents stated it is either not meant for them or their audience as being not visually interesting:

- Maybe they would be acceptable for some underground project. They are not meant for the market that I am working for. {8}

- I don't think it will become part or our daily routine. I think the market for AI generated visuals would be in smaller clubs and parties, where visuals are just some random graphics moving to the rhythm, and they do not carry any meaning or tell any stories. It looks like a replication of an acid trip. Although the aesthetics are not something extraordinary for me. I would say it is like an attempt to replicate the human vision through computer graphics. From this perspective I find it interesting, but not for the aesthetic properties. {5}

- I was a lot into Google Deep Dream, but then I realized it is just this super particular imagery and actually I don't fully like it. They are fine, but kind of the same looking, so everyone who is using it, creates the same kind of artworks. It is a bit too much of a glitch for me as a designer. It

creates too much noise in my opinion, not specifically Google Deep Dream, but in general AI images or sounds have a lot of noise and that is not really my aesthetic. {6}

- I think with video the thing is that it depends so much on the data that you feed it, it just replicates it. So the aesthetic is not very interesting for me at the moment. {1}

The statements of subjects from the second "critical" group {8, 5, 6, 1} are somewhat congruent with previously discussed Berlyne's experimental aesthetics theory [Berlyne, 1971], which states that stimulus that is too novel is judged unpleasant. Therefore it should fall somewhere on the right side of the Wundt curve (Fig. 2). However, the "affectionate" first group {7, 4, 3, 9, 2} proves the opposing theory of Silvia [Silvia, 2005], which, adapted to this situation, states that the effect of AI generated visuals on emotions of each subject stems from his/her own subjective interpretation rather than objective qualities of the visuals. According to this theory, interest and enjoyment follow two different curves, therefore the Wundt curve renders invalid.

4. Discussion

Like in all qualitative research there is no right or wrong, therefore findings of this research should be naturally considered suggestive rather than definitive. What is interesting to note is that almost all of the respondents agreed that they have used AI in some form during their practice either knowingly or unknowingly. This suggests that AI might be soon implemented in VJing to a noticeable degree. When asked about when they expect this to happen, most of the interviewees presumed 1-3 years from now on, with only a few more skeptical guesses of 10 years. In either case, the future seems very intriguing.

This research focused on the topic only from the standpoint of a VJ, although the primary consumer of the visuals is the spectator. Therefore it would be interesting to conduct a research from the perspective of spectators or other stakeholders. How would they feel if human VJ was replaced by AI VJ? Would they notice it at all? Wouldn't they have uncanny feelings about the AI generated visuals? Three interviewees made remarks regarding drugs: two found similarities between AI visuals and acid trip, while one proposed to employ AI to test what drugs were taken in the club and tailor the visuals accordingly. That would suggest several possible directions for future research combining drug use and AI generated/club visuals.

The HCI features (if humans will have to interact with future applications at all) were not considered in this research, therefore UX/UI design, as well as underlying technical specifications would also require further research before making a prototype. Eventually rather than developing the software from scratch, maybe it would be more beneficial to develop a standalone plug-in that could be used within existing VJ softwares, this way making it more accessible.

The interviews with VJs showed that some of them have truly exciting ideas. So as suggested by one of the interviewees, when developing an AI powered VJ software, would be great to enable it to learn creativity from everyone who is using it. This could turn into a fascinating cloud of creativity. If the system became completely autonomous AI VJ, it should still be able to evaluate and tailor its visuals to be liked by human spectators, otherwise it would eventually start streaming what it likes, and that could simply be white noise. In ideal case, such software should have separate modes: fully automated and more manual. If a dedicated piece of hardware was to be made, it could be a dongle, fitting in a pocket, that could be plugged in the beamer or a screen and further controlled by the smartphone. This would eliminate the need of carrying a laptop to a club or other tight venue.

5. Conclusion

Introducing AI to VJing and framing a research within this interdisciplinary field lacking a framework proved to be a challenging task. VJing by itself is vague and not a measurable fact, therefore the only way to approach an answer to the initial research question - *how would VJs benefit from AI implementation in the field?* - was by means of qualitative methods.

The interviews with nine professional VJs from different fields revealed that most of them anticipate the future with AI VJ assistants helping to cope with boring tasks, while leaving the creative part to themselves, humans, that was in line with the theory of McCaffrey and Spector [McCaffrey & Spector, 2018], which states that human–machine synergy is more innovative than either partner working alone. Even though none of the subjects expressed fear for the future scenario where AI would become better VJ than themselves, some skepticism was prevalent hinting at possible fear of the unknown. Respondents' insights regarding aesthetic properties of AI generated visuals seem to prove Silvia's [Silvia, 2005] experimental aesthetics theory, stating that interest and enjoyment follow two different curves. The future research could possibly find optimal properties for AI generated visuals to be enjoyed by most. Designing a prototype of AI powered VJ tool and testing it in experimental and eventually a real world setting would be a logical subsequent step.

I hope that the findings of this paper contribute to the collective knowledge of software developers, artists, researchers and other interested parties, which in turn contributes to the quality of audience experience and the quality of VJ scene overall.

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7. Appendixes

Appendix 1.

Questionnaire (English)

1. Do you give permission for this interview to be be recorded and the recording stored on Leiden University server based in EU for up to 5 years?
2. What is your VJ (artist)name?
3. Do you give permission to use your name in the paper? Otherwise only your qualification will be mentioned.
4. How did you become a VJ and when?
5. What kind of events do you VJ at?
6. How often do you perform?
7. How would you classify your VJing style? (animation, 3d/2d, own footage, found footage, generative/pre-rendered)
8. What is your experience with AI (be it practical or theoretical)?
9. Have you ever used AI in any form for your VJ performance? (pre-rendered)
10. What is your opinion about the use of AI for VJing?
11. AI (more precisely, GANs) is now widely used for generating text, music and images, but generative video is somewhat in its infant stage, mostly due to high processing requirements. When do you think we will have autonomous networks generating real time visuals suitable for VJing?
12. Currently many of the VJs, who label their visuals as being made by AI, are actually employing machine learning (ML) to train agents that are then being displayed on the screen as 3d or 2d models, where they usually appear as human-like figures. What do you think about such method? (maybe have some examples prepared in case interviewee doesn't understand)
13. Many visuals generated by AI are uncanny or unpleasant to watch (e.g. Google Deep Dream). How do you like their aesthetical values (maybe have some examples at hand)?
14. Do you think human perception will adapt to these aesthetics (just like we adapted to photography and digital art) so that they become broadly appreciated?
15. Would you be interested in training a neural network on your own visuals so that it could replicate your style on its own? Would you feel threatened that such a network could become better VJ than you are?
16. How important for you is the human touch in VJing? VJ is usually hidden and invisible for the audience, do you think audience would notice if the VJ was replaced by machine?
17. Imagine a VJ tool where you could choose the balance between human involvement and AI involvement. Where on such a scale would you place your practice?

```
|_____|_____|
Completely human         Semi-AI         Completely AI
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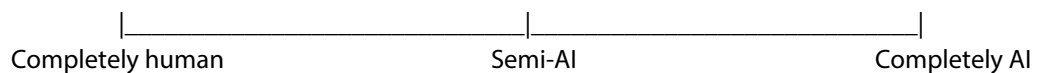
18. Which other features would you expect from such a tool?
19. Do you consider VJing a form of art or rather a technological speciality?
20. It is argued that AI is only good for repetitive tasks while creative tasks could only be efficiently undertaken by human-computer collaboration. What do you think about that?
21. Imagine this utopian idea: a decentralized autonomous organization (DAO) of VJs emerged. It would learn from the works of all the VJs in the world and it would be capable of generating visuals in any style. Human VJs would become just a stakeholders of it, and could possibly share the profits. How would you feel if that happened?

Appendix 2.

Questionnaire (translated to Lithuanian)

1. Ar sutinki, kad šis interviu būtų įrašomas ir įrašas saugomas Leideno Universiteto serveryje iki 5 metų.
2. Koks tavo VJ pseudonimas?
3. Ar sutinki, kad tavo pseudonimas/vardas būtų naudojamas straipsnyje.
4. Kaip ir kada pradėjai VJ'auti?
5. Kaip dažnai VJauji?
6. Kaip apibūdintum savo Vjavimo stilių? (Animacija, 2d/3d, savo kūrybos ar rasta medžiaga, generatyvios ar pre-renderintos vizualizacijos?
7. Ar turi patirties su durbtiniu intelektu? (praktinės ar teorinės?)
8. Ar kada nors naudojai dirbtinį intelektą (bet kokia forma) savo VJ pasirodymui?
9. Ką manai apie dirbtinio intelekto naudojimą Vjavime?
10. Dirtinis intelektas, ar tiksliau, GAN, gan dažnai naudojamas generuoti tekstams, muzikai ar paveikslėliams, tačiau kol kas beveik nenaudojamas generatyviniams video, dėl didelių apdorojimo reikalavimų. Kaip manai, kada turėsime autonominius tinklus, generuojančius projekcijas gyvai, kurie būtų tinkami Vjavimui?
11. Dauguma VJ'ų, kurie reklamuoja savo vizualizacijas, kaip sukurtas dirbtinio intelekto pagalba, iš tikrųjų mašinų mokymo pagalba išmokina 3d ar 2d agentus, kurie tuomet būna rodomi ekrane, kaip žmogiškos figūros. Ką manai apie tokį metodą?
12. Dažnai dirbtinio intelekto vizualizacijos pasižymi tuo, kad būna nemalonu juos žiūrėti, (pvz. Google Deep Dream). Ką manai apie tokių vizualizacijų estetinį vaizdą?
13. AR manai, kad žmonės su laiku pripras ir prie tokios estetikos (visai kaip pripratome prie fotografijos ar skaitmeninio meno?) ir jie taps vertinami plačiosios publikos?
14. Ar norėtum išmokinti neuroninį tinklą tavo vizualizacijomis, kad jis galėtu atkartoti tavo Vjavimo stilių? Ar nejaustum grėsmės, kad toks tinklas galėtų generuoti geresnes projekcijas, negu tu pats?
15. Kaip svarbu tau žmogiškas aspektas Vjavime? Vjus dažnai būna nematomas publikai, ar manai jog kas nors pastebėtų, jei Vjaus vietą užimtų dirbtinio intelekto mašina?
16. Įsivaizduok VJ programą, kurioje galėtum pasirinkti iš skalės: arba projekcijos valdomos tik žmogaus, arba tik dirbtinio intelekto, arba tarpinis variantas - žmogaus ir dirbtinio intelekto bendradarbiavimas. Kurią iš šių funkcijų naudotum?

|————————————————————————|————————————————————————|

Tik žmogus   Žmogaus ir dirbtinio intelekto bendradarbiavimas   Tik dirbtinis intelektas

17. Ar pageidautum dar kokių nors funkcijų iš tokios VJ programos?
18. Ar laikai VJavimą meno forma, ar labiau technine specialybe?
19. Populiaru manyti, kad dirbtinis intelektas gerai atlieka tik pasikartojančias ir nuobodžias užduotis, o tuo tarpu kūrybinės užduotys sėkmingai atliekamos tik žmogaus ir dirbtinio intelekto kolaboracijos dėka. Ką manai apie tai?
20. Įsivaizduok tokią utopinę idėją: jei atsirastų decentralizuota autonominė organizacija (DAO), kuri išmoktų Vjavimo iš visų pasaulio Vjų ir galėtų generuoti vizualizacijas bet kurio iš jų stiliumi. Tuo tarpu žmonės Vjai taptų tik akcininkais, kurie dalintųsi pelną. Kaip jaustumeisi, jei tai taptu realybe?

Appendix 3.

Interviews transcription

1. Darien Brito

1.1. Yes.

1.2. Darien Brito.

1.3. Yes, that's fine.

1.4. I began doing graphics, because I became interested in algorithms and they were the best and most simple way to see them occurring. I come from the sound background, I am a musician so I just wanted to see the algorithms that I was using for sound and it made more sense to look at them rather than to hear them sometimes. I started about 6 years ago.

1.5. I always do my own audiovisual performances, where both audio and visuals are made by me.

1.6. Maybe couple of times in every 6 months, not so often.

1.7. It is real-time algorithmic. I do not use any pre-rendered footage.

1.8. Actually the thing I am building right now is AI within the software I use to make the graphics. So basically AI is the thing that a lot of people are very hyped about now and a lot of people imagine these crazy things that you can do with it, however not many people know how it works or functions and I think one of the most interesting parts of it is to see how it learns and how does it all happen. The purpose behind this thing that I am building now is just to visualize the learning process. So instead of creating something with AI per se (of course it works and you can make something generative with it), I am interested in visualizing how does it learn. At the moment there is a classifier, auto-encoder, there is also a convolutional neural network (CNN). GAN's we still didn't put there. All the code I wrote myself from scratch.

1.9. I haven't used it yet. We are doing this AI project with a colleague of mine. We think there are some interesting things we could use for projects, visually also. But mainly the project we have now is to look at it so it becomes performative as well, although not the classification process, but the learning process, so you could play it live with that. We are working on many different ways to visualize it because it is hard to come up with a smart way. At the moment what I find fascinating is having a massive amount of pixels and assigning a neuron to each pixel, so we have a texture and it becomes a very live thing. When it is learning you can see it firing up and doing things all the time. This could be used as a map for something else, like a displacement map for 3D geometry or like a control for displacement of textures. Or you could just grab the data directly as pixels and do something else with it. But we are still not there yet.

1.10. See previous answer.

1.11. I haven't used GAN's, that's a next step. With GAN it takes a little bit of planning how you deal with the data structures. The code itself is not so hard and principles from the other networks apply, but the way you handle the data and how you structure a neural network – that is a bit tricky. I still didn't find a good reason to use it at the moment, because I was only dealing with images, so just CNN is enough, but later on for sure I want to try GAN's.

1.12. I haven't tried that.

1.13. I think it is very limited at the moment and maybe it reveals a lot of how it works, so they are not yet at a state where you could call them creative. Like for example with AlphaGo, which is the most impressive example. It becomes creative because it comes up with new strategies in the game, but I think with video the thing is that it depends so much on the data that you feed it, it just replicates it. So the aesthetic is not very interesting for me at the moment.

1.14. -

1.15. That is actually why I started doing this research. I wanted to do exactly that – feed in my own things and see what it comes up with. I have no worries that machine will take over my work – I don't care and I would be very happy if it takes the boring part out of it. AI is interesting at the moment not because of what it can do but because of what it can show you about yourself. We do a lot of things that we do not notice, like patterns and the computers can know us better than we know ourselves in some ways. For example Facebook has all these crazy algorithms that predict what you gonna buy or what you gonna like and they are more accurate than I can tell or a friend of yours can tell. I think in the aesthetic domain it is the same – if you train a machine to learn your style, you will learn some things about your own style that you do not even realize. I think that is the interesting part. Maybe later it will become more interesting when it becomes playful and creative.

1.16. I think human element in performances of electronics is a bit overrated. I think the beauty of electronics is that you have machines that can do things that we can't. So why try to humanize things that are inherently electronic. I think it is an advantage to use and I am not so excited to see a guy moving knobs. I don't like to be exposed as a performer and I think it is not really important.

1.17. I build all the tools I'm using by myself. But in such a tool I would be somewhere in the middle.

1.18. There were a few mentioned in previous answers.

1.19. Well it depends. Sometimes you really cannot tell how much craft is put behind some VJ work. Clearly if you do something very basic, like a light on a kick or a bouncing ball, that is not art, but a technical effect. It does not transmit anything, but on the other hand sometimes you can do very simple things that they work so well with the event or with the music. There are too many things to consider to clearly say if it is artistic or technological. For me it is very important that my visuals have a narrative, time development and form. I am not so much of a fan for those eye-candy things that just do one same thing for 10 minutes. I like things that move and transform. So I would say the artistic element in my own work is how to craft the transformations. Sometimes when you do 3D, you spend a lot of time doing lighting, rendering, shading etc. That can also be an art in itself, but it depends how relevant it is for the piece you are making and the audience that you are playing it for.

1.20. I would be very happy if it takes the boring part out of my creative process.

1.21. I think it would be wonderful to see what it comes up with and also it is very exciting to know that there is something out there producing work all the time that you can just check. On the other hand it becomes like this economic system where you are an artist and also a shareholder having a stake in the company, I think that is a terrible idea and from this point I don't like it. But from the point of research of course it is super cool.

2. Vytas Realtime

2.1. Yes.

2.2. VJ Realtime or Vytas Realtime for parties and festivals. For theater performances it is my real name.

2.3. Yes.

2.4. I started around 2004 experimenting with software.

2.5. Parties, theatre.

2.6. About once or twice a month for parties. And for theater shows – one to three times a year.

2.7. Mostly it is generative graphics and 2D, although recently I started playing with various plug-ins for 3D, also generated real-time, not pre-rendered.

2.8. I have no experience working with it, but I know what that is.

2.9. I have not used the AI itself, but some found footage visuals generated by Google Deep Dream, because it looked visually beautiful to me.

2.10. I am not familiar with how it could be applied for Vjing, but I believe the possibilities are very vast.

2.11. It is hard to tell. I assume it is already doable with technologies available nowadays. But I guess it could become widely available in 2-3 years.

2.12. I haven't seen anything like this, but I can imagine how it looks like. In my opinion that is quite boring and I think AI has potential for more interesting things. I would even call this technique a modern WinAmp visualization and you do not need AI to synchronize the movement to the beat.

2.13. I think that VJing overall is about exploring new aesthetics, because VJs tend to work with new technologies that are usually still in experimental versions. So the aesthetics often emerge from the technologies used, something like the aesthetics of the insides of the machine. I find it very interesting and have even written a short essay about the aesthetics of VJing.

2.14. It is very probable. The tendencies nowadays are that aesthetics of AI are attempted to be made as realistic as possible to mimic the reality, as for instance in DeepFake. So in this sense the aesthetics do not play an important role. And inevitably human eye will adapt like it adapted to many things before, like 3D animations.

2.15. I would be interested. That would be like a new angle for me and maybe instead of applying it somewhere, I would rather like to observe myself from aside through it. If the results are good, maybe I would use it in my VJ practice, but as for now I prefer the generative visuals and I like to perform myself. And I would not feel the threat of it becoming better than me. I have no doubt it would make some things better than I do, and I think it is exaggerated that AI would steal the VJ jobs.

2.16. It is hard to tell. I think the audience would not notice that, but for me personally the pleasant thing in VJing is being present at the venue live. I myself try to observe the audience and it is great when they react to what I do, meanwhile I really do not care if they do not see me.

2.17. I think the most interesting would be a collaboration with AI, so it would be a sort of a VJ partner. I used to

work with a partner a lot before and often the partner has a completely different approach to certain things and they sometimes become a source of inspiration to yourself. And as for AI it depends on how would it be trained. If it was trained on my own style, it would not be so interesting to collaborate.

2.18. I am curious if one could train the AI to detect what kind of drugs people are using in the venue. And then based on that it could choose what kind of visuals would give the audience most pleasure and enjoy the music and atmosphere even more. That would be a very complex thing and I think we are still quite far from achieving this.

2.19. I think it is more of an art form, but very highly influenced by technology. As an example, if you want to paint on canvas with oil based paint, you would not be able to do that without the paintbrush and the paint itself. Overall I would say it is 50-50 art and technology. It is inevitably technical process due to the technologies required, experimenting with which brings some new artistic and aesthetic things.

2.20. Yes, I agree. I think it would be quite interesting if there was an AI software that would be able to learn creativity from everyone who is using the software.

2.21. I think it is a good plan. I can imagine that the ratio between creative input and the monetary output would be unprofitable for the artists, nevertheless the idea sounds really good. The threat would be if someone would hack the system and use it without contributing anything. I think many businesses are using similar principle nowadays, for instance car-sharing or accommodation services. I think the main power of people is that they ask such questions and create technologies like this one or something more simple and then later those technologies become something completely different. Just like some experiments with transmitting information through radio waves became TV which is such an important part of our lives now, but back at the experimental phase no one would have even thought that it will become so big. I would like to cite Arthur C. Clarke: one can imagine the most peculiar thing but the reality will be even more peculiar.

3. VJ Crystal

3.1. Yes.

3.2. VJ Crystal

3.3. Yes.

3.4. It actually happened quite randomly, when I had to choose an IST (individual study track) at school and I though all of them were a bit boring except the VJing course. That is how I got into making 3D animations. From there I lifted off. The IST was only 3 months, but the teacher was really free about what you could do so I really had time to explore what I want to do. Then I started doing small shows. It was about 4 years ago.

3.5. Parties.

3.6. Once or few times a month.

3.7. I actually think I am one of the seldom VJs who uses all of my own footage, which makes it more difficult because it is obviously a lot of work and most of the time people don't want to pay for it and a small client can not afford it. It is nice but also not handy. It is animation, which I export from one software and import into VJ software, where I mix it. The prime material is made beforehand, but I change a lot while VJing.

3.8. Not so much. I work with Unity now, I graduated with a video game and I have been using the AI that Unity provides to train the agents, but I have no experience with programming it. I know a bit about AI from a friend who studied it. It always intrigues me, but I find it quite difficult, even though I know how to code.

3.9. No, also because I make everything myself. So that would be hard to make and import into VJ software.

3.10. I think it is actually super cool and I would use it. It is just that I did not get a chance to work with somebody. Because I feel that if you want to do something like this, you need to be in a team. I know that there are people who do interactive VJing but then their material is not important, it is more about the idea. And for me my material is very important. And I think if you want to make a really good product this way, you need at least two or three people. You need an IT specialist to set the AI right, or there must be a program that does that, but it is such a niche.

3.11. I think it is shorter amount of time than everybody thinks. I think within 3 years, maybe earlier. It is because I have already seen so many changes in Resolume in the past 4 years. The techniques when it comes to interactive stuff are growing exponentially. If you look 5 or 10 years back for example, I have seen Unity change in a very short time from being super basic and not having a lot of tools to already having downloadable packages for Kinect or certain VR glasses. If that is growing, I think AI will also get there.

3.12. I would personally go a bit further, because this technique seems a bit too literal. If I used AI, I would use it to respond with the images in a social way. If you think of what it can do, it is a maybe too easy to just mimic the human movements. I am thinking about recognizing faces and doing something with them visually according

to the features. Just like Aphex Twin tracked the faces of the audience and replaced them with his own face. There are two types of VJing: the one I do that I am not very content with and that is not something I want to promote – it's just showing pretty images and making them fit in the background complimenting the music. But then there is another type of VJing with deep concepts that makes you think and gives you the "wow" or "i spy on you" feeling and I think that is a very nice thing to implement, because often parties are very boring, at least in the Netherlands. It is also because visual elements are lacking and something deeper is lacking. I really believe that something like what Aphex Twin did is really the future of what can parties become. It is not only about the music, it is also about the experience. This is also why I started Vjing because I though that I want to bring something more into that, but at this moment I don't know how to go further.

I think there is one little issue with AI – when it comes to cameras and computers, as soon as something is being filmed, it doesn't matter if it is not being recorded, I am a bit disturbed and worried about that in general, because it takes away people's freedom and I think that is where AI is on the edge between being super awesome but also dangerous. When you go into a club, you want to get loose and do not want to be bothered that the day after your boss would tell you "oh I saw you had a nice party yesterday", showing you some film on the internet. It is an extreme example but it might happen. So that is something to think about.

3.13.   I kind of like it. I like that it is creepy, just because we make AI and it portrays our deepest habits. If you look at humans being humans, we are not that good. And I think what AI does is mimicking our behavior in a very basic way without being human.

I think such visuals have interesting value, but as soon as it becomes perfected, it kind of loses its purpose, except for being a handy tool. But as for now it shows us something in between being a human and it has its own character in a way. You don't really know what it is but you recognize it and that is why you feel uncomfortable.

3.14.   Definitely, but I think in the future the images will not be that weird anymore. I do think we will adapt just like we were adapting to all sorts of things. Things that were bizarre 20 years ago are now considered normal, for example people wake up and go to sleep with their phones.

3.15.   Yes, that would be interesting. I don't think it would become better than me yet. A few years ago I was watching a lot of documentaries about AI taking over the world, but if you look at how a lot of things are made now, for instance newspapers or cars – there are a lot of machines doing the work that people used to do a while ago, so in that sense I am not worried because still there is always somebody who needs to program the AI. The moment when AI will start writing it's own programs and we will become obsolete, that is something what I am wondering if it is going to happen.

3.16.   In my case, I like to stand on the stage, but that is because I am such a small VJ and also sort of a character. But I think people would't notice that, because there are a lot of VJs who make tacky work. My work is very shiny and very controlled, but those VJs who make much more grainy or random visuals – noone would notice if they were replaced by a machine.

3.17.   It depends. But as a human you always want to add your own value to things and have control. Maybe that is also why singularity is not going to happen, because we want control over everything. I think there will be programs that have a slider from no AI at all to all AI. It depends on the project how would I use it. For example many people like to have a garden where they just plant some zucchinis and then eat them even though they still go to the grocery store. I think a similar thing is going to happen with us a lot when AI takes over, so at some point you might just like to make a project that you make almost completely yourself just because you like to create. We as humans need a purpose and I see it with myself that I like to have a knife and carve sticks when I'm on vacation, because I have nothing else to do. Not that it matters, it is not going to go anywhere and the stick is going to be lost after the vacation, but humans just like to make things, at least some humans do. So I think it would be a very sad situation if AI would take over everything, because what would we have to do then?

3.18.   -

3.19.   It is a little bit of both. VJing has a very broad range of artists, creators and designers. VJing as you see it in big shows is definitely more of a technical job and less artsy. But smaller VJs are usually more about the idea and concept rather than technical things. It is sort of a medium to use a projector to make images and mix them live. What VJing is in it's purest form – is just playing with lights. For instance playing with lasers is also really amazing but it cannot be considered VJing, it is playing with lights.

3.20.   I have been thinking about creativity and what it means, there are a lot of things going on there and I think you can be creative without being human. There are plenty of people doing the stupidest things which are considered creative. Everything that a computer does, even if it is thinking on its own, it was still programmed by us humans. But if we program an AI that learns itself how to make things in such a deep way just like we

humans do - then is it creative? And there is also a question whether it needs to get the same rights as humans do? These are the ethical questions that are super difficult to answer. Logically, it should be determined who owns the rights to the AI and does AI get anything positive out of it.

The reason why we have copyrights is for the right people to get the profit and recognition, but nowadays AI doesn't really need that yet, it doesn't have such an intricate social system so at the moment you cannot say it is the property of AI, even though philosophically it might be.

3.21. I think it would be kind of sad in a way. But even now a lot of pop stars and big DJ's have ghost producers still, so I don't think it is a bizarre idea, it is maybe just weird that is's AI. Especially if you are a big artist and you have way more to do than just creating your images, as soon as something takes that part over, you can focus on other things. But I do think there is maybe an issue with copyrights when it comes to AI copying something from a well known VJ or a company that does VJ products, then does the VJ need to pay for these makings of the AI? Some people might not be happy about it if they were working for their whole life on something and then out of a sudden the AI would come and devalue human work in that sense. There is also a business aspect to it because definitely a lot of people would just want to make money and they would put some current VJs out of business. But as long as our society keeps on growing in a way that it does now, it should be fine.

4. Tomas Stonys

4.1. Yes.

4.2. I don't have one. Each time I use different nickname, but most often I use my real name – Tomas Stonys.

4.3. Yes.

4.4. I started back in the school during small events, later I joined a company called 'Miracles' and started doing VJing more professionally. It happened around 4 years ago.

4.5. Most often I VJ at corporate and commercial events, but each season is different for me. For example last season it was mostly TV shows for me, both live broadcasts and pre-recorded shows. And during my spare time I VJ at electronic music parties and festivals, but it is more for my own pleasure rather than for money.

4.6. During the summer it is less busy, but during the season which lasts from autumn until spring, I do it every 2-3 days.

4.7. For commercial events, the material is always prepared by animators, I give them directions and supervise the project, only some parts I produce myself. And then before the event starts, I prepare all the material in a way that I just have to play it and there is no way for mistakes to happen. While for clubs and festivals I have quite a large system where I work with Resolume for pre-rendered files and several other pieces of software for generative and interactive visuals and combine them all through NDI or Spout to Resolume. There are audio-reactive visuals, as well as some Leap motion controlled visuals, so I can be very responsive with it. My idea is to make a controller which I could hand to anyone for quality VJing.

4.8. I have no experience, although I have read about it, a bit about Google DeepDream.

4.9. No.

4.10. I would use it for processes that require a lot of time and do not require any creativity. Even now I try to get rid of as much repetitive processes to have more time for creative process.

4.11. In a few years time.

4.12. I think I could use something like this, for instance if I needed some interesting particle system that had a lot of movement by itself, because for VJing one needs a lot of motion on the screen. The movement in cinema became interesting for humans since the very first movies and I think nowadays we need some methods that would easily draw your attention and then it could be composed and arranged by certain theme.

4.13. I like the aesthetics very much and for a while now I want to include it for either some party visuals or even make a projection mapping to create some of that unpleasantness because it affects people psychologically a lot and I would love that, but for now I think it is technically too challenging.

4.14. I think it will become a norm in a while. It is only a matter of time when will it happen.

4.15. I would be interested to try it but on the other hand I would lose my job. Why would someone hire me for making the visuals if there was a tool that could make it. I would naturally feel the threat. But there are some good points to it, I think AI would make some new gaps on the market that would have to be filled in by humans.

4.16. Most often, no one would notice that. In Lithuania, VJ is often not being made important or advertised, while in other places and parties, VJ could be as important as a DJ. But that depends a lot on the event and the place where it happens. I myself would like to get some attention for what I'm doing, but I am used to the opposite and I do not feel bad about it.

4.17. My aim would be to find a way to be able to collaborate with AI. I think it would be great if AI could make a half of certain tasks, while I could combine it all and do the rest of the job.

4.18. I feel we are lacking some options of reality scanning. For instance, to scan the movement of the audience and use it to control certain parameters. Would be great if AI could help us come closer to reality and exploit the space better for the performance. The approach should be not invasive for the privacy of the audience.

4.19. I think it is a technical speciality as for now but in the future it will become more of an art form. For now you need more technical skills rather than art skills to be a VJ. In events market it all comes down to technical skills, because it is cheaper and more effective to hire a technically skilled person rather than an artist.

4.20. Yes, I think the 50-50 collaboration would be the most efficient.

4.21. I think it should be very clear and legally defined system, where shares and labour would be equally distributed. If this problem was solved, then I think I would use such a service. If it would pay me just for using my style, I would have more spare time which I could spend on building up different styles, creating something new and moving forward.

5. Oskaras Gudas

5.1. Yes.

5.2. I used to have several nicknames. It used to be VJ Fou Gudas, then I started using my real name – Oskaras Gudas. I think the nickname is not so important.

5.3. Yes.

5.4. I started around 10 years ago when I was 15-16 years old. For the first time I went to Satta Outside festival, where a lot of attention was given for the visual arts. I remember I saw the line-up, where next to DJ's and live performers there was a lits of VJ's. I did not know what that was and only after asking someone, I figured out that VJ's show projections on the walls. Then I started exploring the festival not by DJ's, but by VJ's and realized that projections were more interesting for me than what was happening on stage. After coming back home, I started researching online and learning to VJ myself.

5.5. Now I VJ less often than before and work more with scenography. So mainly now I VJ for projects, where I make the scenography and want to fulfill my vision. It is mainly corporate events, concerts, some TV shows and a bit of artsy projects with theater.

5.6. Depends on the season but I would say monthly.

5.7. I have tried many things and probably all the technologies. Both my own content and content created by animators, I also played with software for generative visuals, such as Quartz Composer for smaller parties or art events. Currently I come up with an overall concept first and then decide which technology would be most suitable to fulfill it.

5.8. Very minimal.

5.9. No. I have done interactive installations but it was not AI. I used various sensors, Kinect..

5.10. I don't mind.

5.11. I think we will have it in one and a half year. Everything is evolving very rapidly.

5.12. We have done similar projects a while ago where certain parameters were assigned to 3D models and controlled them. But the parameters were either generative or from a sensor. I think AI is just a trendy label for it nowadays.

5.13. It looks like a replication of an acid trip. Although the aesthetics are not something extraordinary for me. I would say it is like an attempt to replicate the human vision through computer graphics. From this perspective I find it interesting, but not for the aesthetic properties.

5.14. I don't think it will become part or our daily routine. And I don't think it will be surprising for people, as it is already not surprising nowadays, since many people have tried FaceApp for instance.

5.15. I would definitely want that and I would be happy if it would be better VJ than me, as it would save my time and I could work on other things.

5.16. No one would notice. It is already happening now that machine is working on it's own, for instance in shows that use timecode, where all the show is pre-planned second by second and VJ as such is not even necessary during the show. In this case, the task of the VJ is only to create the visuals and prepare them for the show. During the show, someone just keeps an eye if everything goes smooth, and that someone does not necessarily need to be a VJ. I aim to make as many shows in this manner, because one can never VJ live as accurately as by using timecode. On the other hand, live VJ'ing is charming, because one can see how VJ reacts to music in real time and interprets it through visuals. In bigger shows that use timecode, one can understand that visuals are not performed live but it is equally interesting to see what a VJ have prepared for it before-

hand.

5.17. I think I would use all options of such software, depending on the project. I think the market for AI generated visuals would be in smaller clubs and parties, where visuals are just some random graphics moving to the rhythm, and they do not carry any meaning or tell any stories. In this case it would not matter if it was performed by human or by AI. While for other events with more artistic value, human VJ would fit better. I think there is a market for each of these options of the tool.

5.18. I have nothing on my mind now.

5.19. I think it can be as much a form of art as a technical speciality. On one hand there are artists who make art and transmit certain messages or create the added value through their visuals, while on the other hand there are VJ's who do completely technical job.

5.20. I think the collaboration between human and AI could prove to be very creative.

5.21. I think that it would still need at least one human to decide which of the style should be used where. If that would be completely up for the computer to decide, maybe for a year it would be OK, but after that it would become very repetitive and boring some sort of pattern would emerge. And to avoid this pattern, we need human involvement. So maybe for humans some technical specialties in VJing could disappear but the creative specialties should remain.

6. Irina Spicaka

6.1. Yes.

6.2. I use my real name – Irina Spicaka. Mostly because of participating in exhibitions and using the approach of bringing VJing to the art field.

6.3. Yes, sure.

6.4. About 16-17 years ago I started listening to techno and going to parties. I understood that it was boring to just go and dance and I started to make some visuals as I was interested in video. I had VJ friends in Riga and they were mostly VJing using VHS. When I started, I skipped that part and I used CDs with recorded videos and mixed channels together on CDJ's. It was quite fun but I was always in a need to prepare video material that was mixed together, usually only on 2 channels with cross-fade and some RGB or B&W effects, a little glitch here and there. It was quite limiting but at that time it was fine. Then some time later, I was introduced to Modul8 and Resolume so I tried out to create little loops from my videos and experiment with them in more advanced level. Soon after I discovered projection mapping and tried to create some sculptures and bring them to the techno venues. Then I have also tried some programming with flash and processing, that was my first try to use creative coding.

6.5. I do audio-visual installations and do not actively VJ at parties anymore.

6.6. Now I do not really VJ because I find it time wasting. I kind of switched to art field. Maybe because I started very early, I think I reached the level where I didn't feel myself so much engaged in VJing. Also I can see how it is right now in Berlin where we have some visual artists who try to do VJing but it is very hard for them because there is no money, so I understood I cannot keep on doing that. Theoretically I still fit in VJ culture but practically not any more.

6.7. I actually sometimes do pre-rendered stuff because I like the composed pieces, but right now I work with VR environment where there will be a mix of pre-rendered and generative visuals. I try to experiment, because otherwise I would get bored.

6.8. When AI popped up, I was amazed and I wanted to explore it but then I did some reading and I understood that I was actually already doing that. The only thing which I found new for me was AI and machine learning for business which I have discovered while checking MIT programs online. My latest focus was computer vision which is also part of AI. It is creating patterns, manipulating visuals and sound, giving a computer certain guidelines.

6.9. Yes I have, as explained in previous answer. It is interesting to ask VJs to figure out if they have been using something like this because I think people just don't think in terms. They know that AI exists somewhere, but actually when you start explain them the methods and approaches they might realize they were already using it.

6.10. I wanted to try some of that, but I understood that I would have to attend Gene Kogan's course or something like this. I was a lot into Google Deep Dream, but then I realized it is just this super particular imagery and actually I don't fully like it. It is a bit too much of a glitch for me as a designer. It creates too much noise in my opinion, not specifically Google Deep Dream, but in general AI images or sounds have a lot of noise and that is not really my aesthetic.

6.11. -

6.12. I use a similar technique for the VR project I'm working on, but I call it creative coding rather than machine learning, because I have never associated myself with that topic, but maybe it is. I think programs like Unity are more about gamification because you have the interaction points.

6.13. They are fine, but kind of the same looking, so everyone who is using it, creates the same kind of artworks.

6.14. People are so much into technology in general with their daily life devices. I think it is more about bringing the AI or machine learning in everyday use. If there will be products that normal people and not only artists would use on their daily basis, then it may be a part of every day. Because I work as UX and UI designer, so I always try to see if there is a business potential and why would we bring this machine learning approach into the particular product. I don't know if there would be enough use for that, I'm a bit afraid people would see it and think it looks kind of broken. All interfaces follow certain guidelines – how they should look, what is the business idea behind it, what is the MVP (minimum viable product). So bringing this superficial art experience with this aesthetic would need to change the mindset of the industry of product design. Maybe augmented reality could use something with it – using your device to see parallel reality.

6.15. This sounds really nice. If there was a tool that could analyze my style and create something. The thing why I never learned AI or ML is because I kind of thought that I would go too far from myself by trusting the machine that would generate something which is not really my approach.
It would be amazing if it became better performer than me, because I could just stay still and do nothing – thats is a dream of my retirement.

6.16. This is a thing that I always mention, because I am an introvert person and when I was going to techno parties and thinking whether I should try DJing or VJing, and because I did not want to be in front of the people, I picked the visual medium, where I knew I did not have to be exposed. I think it is very good if software can run and I don't even have to be there. I don't need attention. I think in visual art the artwork should speak for itself. Although the creator is a mind behind that, but I like the idea that I don't see the human presence when I go see the art. It is also why I switched a little more to installation art, just to have the piece there by itself and myself only present during the opening of the exhibition where people could talk to me.

6.17. It depends what kind of tool would that be. I believe that artist should spend a lot of time in the beginning and then let the machine work afterwards. So I think it is 50-50%, but if we speak about the final result, I think it is like 97% of the machine work, but that is based on my own practice using computer vision. To me it is important to set everything up and see if the machine will execute the program correctly. If it is working, after that I am done. I do not believe in software which can do all the work for you just by pressing a button. It is just like downloading someone else's loops and just playing them. In that case you lose the privilege to be an artist by giving it to the machine.

6.18. -

6.19. My practice is somewhere in between plus the third part – design. I take it from three sides.

6.20. gI agree with that. Sometimes when I create my installations, I feel like his is it and it cannot be anything else, that is why for our latest exhibition in New York we created the interface where people can change some parameters and the image itself changed.
I am currently working on a VR piece and I call it Participatory sensitive environments in non-human dystopia. So the participant who is wearing the VR glasses, is the only one there in the post-human world. I don't think the computers will take over humanity. But I believe that engineers, programmers and designers that work with governments or with huge science institutions which are controlled by the government or the military for example, they have to be very conscious about what they are creating because it can affect the future. But I don't think they could create something that could take over, because there always will be some resistance.

6.21. That is a hard topic, because I think it is a privilege that we can be artists and we always want to put some soul into the project. There are people who are only interested in creating concepts, so for them this organization would be good, because they are not touching anything technically or are able to code. Another point is that aesthetics could clash, for example if I give a task or bring my concept to someone and they would create it the way they understand it. We as artists have the privilege to create the context or something visual with our mind behind it. You could teach computer to completely replicate you, but human is an evolving creature and gets new input on everyday basis from reading, going outside and just seeing things which gives you new ideas and inspirations everyday. So I don't think you could completely trust the machine on creating instead of human.
If such a machine was made – I don't think it can maintain or hold the quality of a real human.

7. Rimas Sakalauskas

7.1. Yes.

7.2. Usually my real name is used: Rimas Sakalauskas.

7.3. Yes.

7.4. I used to work in a video production company where I learned about projection mapping. We made a few projects there, but soon I quit and started freelancing. It happened in 2012.

7.5. Theater and concerts.

7.6. If showing visuals at theater can be called VJing, then about once in few months.

7.7. It is mostly my own 3D renders. And I would say around 10% of video footage.

7.8. I don't have the real experience. But for instance last autumn I needed to make some animations out of drawings and making it by hand proved to be very slow, so I started looking for plug-ins and eventually used something that was called Dynamic auto painter and they claim it is AI powered. Unfortunately the quality of the result was far from human made animations, so I would call it a superficial imitation. Another example is StyleGAN which can imitate the style of Van Gogh, but the movie Loving Vincent was still made completely by hand by thousands of painters who worked for years.

7.9. Only what mentioned in previous answer.

7.10. -

7.11. I think it will not happen soon. As an example, I do work with Maya and Cinema4D and still in 2019 I need to make an insane amount of manual and repetitive tasks, which I think take 99% of my creative time. There are tiny tools appearing to improve the situation but even if I want to make something as primitive as camera tracking it takes incredible labour. I feel like the technologies used are still from 20 years ago. Maybe AI for Facebook or Instagram will be implemented soon, but for the professional tasks I need it for, I don't think it will happen soon. After Effects, which is the main software for video composing, is another example where it just becomes more and more slow with every new release. I think we would need new tools for using AI, rather then implementing it into already existing software.

7.12. I have not tried it. I wanted to try Unreal Engine, but did not have enough time to get into it. I would use it for creating games, where render works way faster, and I would think how to include it in my video practice. I recently bought two Nvidia GPUs, because they advertise AI-accelerated denoiser for removing noise from the pictures.

7.13. There are also DeepFake and other applications. About the aesthetics I think it classifies as contemporary internet glitchy-trashy. I would use it maybe, as I have used some broken codec extension. But the problem I noticed with such applications is that they are always in beta version and never get released. They usually just become outdated and other beta versions emerge, never reaching the pro phase. So they are only good for playing around but not for the working process.

7.14. Of course we will adapt to it. The standards and mainstream keep on changing and shifting all the time. Maybe not everyone will like it but the same applies to everything, from fashion to other trends.

7.15. That would only be good for production, not for creativity or research. It is very human to keep exploring different styles, while AI would only be good for producing something in particular style. Creativity also involves production, but on the other hand if all goes down to production, it would become just machine stamping.
I would love to have an assistant that would be able to do the repetitive work for me, because now it sometimes takes months for me to do the repetitive tasks such as modeling or synchronizing.
As for the threat, I think even now there are a lot of people who could do the same work better than me and cheaper. But humans have a tendency for liking certain brands and names, even if they are not the best. We get attached to a name or brand. So I do not feel threatened by AI. Because people for whom I work trust me and hire me. There are both social and psychological aspects influencing this trust.

7.16. For me it is not important at all. I find it meaningless to be present at the party the whole night. Maybe at the beginning of the party VJ presence is still important, but not so much at 3am.

7.17. I feel the AI assistant would be great. But for now it is hard to imagine how that assistant would work and how would I have to interact with it and control it. We can only imagine assistants as human, but AI assistant might be some piece of software that would be very difficult to control. It also depends on how pleasant the task is. Naturally unpleasant tasks I would just give all for AI, but the pleasant ones I would like to do myself. For instance yesterday we had a photoshoot of visuals projected on a girl. In this case I wouldn't want AI to do the job because I enjoyed the whole process. The monotonous tasks I would hand to AI to have more time for

creative ones myself.

7.18. I would like it to be able to speed up or slow down the footage flawlessly with filling in the missing frames. Automatic synchronization with the music would be another great feature. I wouldn't want the audience to influence the visuals, because then the visuals would become the creation of the audience and VJ would become not necessary anymore. If the audience knows what they want and AI can help to fulfill that wish, then the VJ would only be an obstacle for that. It is interesting to know the principles of the audience, but I believe the VJ should provide the rules of the game that should be followed by the audience linearly, not interactively, just like when I come to the concert I do not want to sing there myself, I want to listen to whoever is singing and enjoy it. If I wanted to sing, I would go to karaoke. The same goes with movies: when I watch a movie I do not want it to change depending on my mood. Or when I read a book, it would be pointless if it would adapt to your mind. It would just create a feedback loop where you would be reading what you want to read and that would simply eliminate any improvement.

7.19. I think it is more technical, because one cannot invest a lot of time in VJing, it is evaluated by parts of second. Just like we expect a good sound in the venue, we also expect good visuals as a whole. But on the other hand it also needs some artistry and skills.

7.20. I think AI can be creative. For instance the chess or GO playing AI was often making more interesting and unpredictable moves than human. So I think AI has the potential of being unpredictable and interesting. On the other hand, in chess or GO there is a clear goal which has to be achieved, while in creativity or arts it is very hard to formulate the goal, because the process and various social components are equally important as well.

7.21. I wouldn't mind it, but I think if such a scenario became reality, one person would become a shareholder rather than all of them. In most of new technologies, huge capital is gathered in only a few hands and they usually do not want to share it with others. And also it is a fact that certain jobs will become extinct, just like the telephone operators became obsolete due to emerging technologies. It is hard to predict how will the technology evolve. In recent years it seems like the computer development is slowing down.

8. Barbora

8.1. Yes.

8.2. Barbora.

8.3. Yes.

8.4. I work in this field for 5 years. And how I started is a long story. Since childhood I was attracted to visual things and during the 2nd year of my studies I became interested in lighting, then during Erasmus exchange I took all the lighting courses I could find. Later on I started working as a light technician for a company. Once they bought a LED screen and asked me to work with the visuals. It seemed like a natural thing to me, since my background is graphic design. So it naturally became a part of my job during the events.

8.5. Concerts and conferences.

8.6. Some months I have up to 12 events and others might be only 3 or 4.

8.7. I work in 3 different fields. First - making animation from drawn material, second - editing stock footage and video loops, and third – creating my own content using 3D and graphic programs.

8.8. None.

8.9. No.

8.10. I'm not familiar with the possible applications.

8.11. In 5-10 years.

8.12. Once I needed to animate the face of a character and I used the plug-in in After Effects which tracked the face of a person in front of the camera and applied it to a 3D model, I guess it is quite similar.

8.13. They are not meant for the market that I am working for. Maybe they would be acceptable for some underground project, it really depends on one's taste.

8.14. Yes.

8.15. Yes I would like to. Even if it would make better visuals than I do, I believe it would still be my intellectual property. Although if that happened soon, there might be many questions regarding ownership and legal issues, because the legal system is not prepared for it yet. But when the law for it is ready in the future, I see no problems using it.

8.16. Out of the whole arena only one or two people might notice that. And the human touch depends a lot on the performer on stage and the performance. Some performances are using timecode and the performer simply sings along the playback. In this case the human touch is not so important. But if the VJ needs to make decisions real time, based on the actions of performer, then human aspect is very important.

8.17. Probably I would use it on the middle, giving the repetitive tasks to AI and the creative ones to human.

8.18. Main expectation for it would be the ability to work by references, so if VJ could upload the reference and the software would automatically apply the styles according to it. Another expectation would be the possibility to process live video feed from the camera, applying certain filters and effects. And one more - audio-reactive feature.

8.19. It depends on the context. I would say it is more a technical speciality, because if the video files for the show are prepared well, anyone can play them, even the machine on its own. Meanwhile the creative task is preparing the files.

8.20. Yes I agree with that.

8.21. It would be great. If that would give me part of the revenue, it means my knowledge would generate me money while I'm asleep, and that is the goal in life. I would definitely not feel redundant and would find some other activities for myself. If the job I'm doing now will be obsolete in 10-20 years, by that time I will be adapted to the market with new skills. It is the most important to not fall behind from the needs of the market. VJs, light technicians and artists all must learn every day in order to keep up with the market. If our current function is not necessary, there will be other functions where we will be needed.

9. Carolien (DEFRAME)

9.1. Yes, no problem.

9.2. DEFRAME, that is a collective I'm part of.

9.3. Yes.

9.4. I started at the art academy. This was I think 10 years ago. I became a VJ because I liked to go to parties and to listen to electronic music and I often saw a VJ and thought that I could do it better, because I was making animations and photographs and I though I would like to do VJing to.

9.5. Techno parties. Mostly at clubs, but sometimes also at festivals.

9.6. Now not so much anymore. Out collective performs about once in two weeks. I myself am now more focused on installations and not so much the VJ world anymore, but I think I still perform once in two months.

9.7. We have sometimes generative stuff, but most of the time it is still non-interactive, but pre-rendered loops for Resolume. And then we have a mix of different media – digital animation and also analog photography and we experiment by blending different kinds of media together.

9.8. I have experience, not in VJing, but in installation work.

9.9. No.

9.10. I think if it is stable enough and the program won't crash, also if it delivers aesthetically pleasing images then yes, I would use it.

9.11. I think maybe in a year or two or three. We need really powerful GPU's or powerful networks that one could do it on the farms or something. But I think you would rather have it locally.

9.12. I have never done that.

9.13. I like it, it is a little bit like tripping on acid. But it is not very original, so if you work with it, you really have to have an interesting concept that is not too random and makes it interesting. Also there is a reaction-diffusion algorithm, it looks kind of pleasing, but it is not creative enough for art, so the artist should have his or her own idea.

9.14. Yes that is possible. It is just too new and people will have to get used to it.

9.15. That is interesting. I have worked on automated VJ setups, especially when there is not enough money for us to perform, so we set this automated VJ that can look through the deck, like auto-pilot, but it is music-reactive and when the music is really fast, it chooses one group of visuals and when music is slower, it shows another group. It is kind of a little bit smart but not super smart. But still there is a human element in there that you have to teach the vibe of the music, and I don't think you can really automate that. I prefer human over computer controlling it. Because we are not smart enough to make the computer trace the vibe of the music. And you also have to have very many inputs - the color of the lightning, the atmosphere and music style – it is very hard to interpret them. If the AI would reach the level to interpret all of that, it would be great.
I wouldn't feel threatened by it, maybe just a little. I myself try to move away from VJing because of having to stand there all night, getting small payment and also people not appreciating your work very much. So I do not feel threatened. But then I am thinking if the VJ can be automated, why cannot the DJ be automated as well? And then would you even have to go to clubs? I guess yes - to meet each other, but thats an interesting question.

9.16. No they would totally not notice. The funny thing is that usually you only see the VJ when he messes up, when

you see totally wrong color or something that goes really wrong. And while it goes well, many people do not even notice it. It is like an unconscious layer, still it is an important layer, but for many people it is really unconscious, they do not notice it. So they wouldn't notice if it is a human or a computer.

9.17. That would be nice to have half-half. Just like now we use audio input, then we would have a kind of more smart audio input, but still you could decide on some things. And then if you have to go to the toilet, you could leave it completely for the AI.

9.18. Maybe it could predict what is coming next in music, because sometimes you are a little bit late when the DJ turns a different vibe.

9.19. That is interesting, because sometimes we are booked, we are booked as artists and then we can sit in the artists' lounge, get free drinks and be treated as artists. But other times we are treated as technicians, like light or sound technicians. We like to see ourselves as artists, but the outside world sometimes sees us as technicians.

9.20. I think AI on its own not yet can be creative, but it can help in the creative process by showing different choices, so it can be supportive but not creative on its own.

9.21. I think it would block a little bit of innovation and a need to create new things, because it would only replicate. And if it is cheaper to put a computer out there instead of human, then less humans will be VJs and less innovation will be done. So I'm not sure it is a good idea. Lots of experimentation happens when you are VJing, especially after an hour or two or three, because by then you had all the options and you think of new options and new things. That is where the creativity is – being there with the music and with the people and it cannot really happen in your studio.