

# **3D VISUALIZATION: REVEALING IMAGERY SPACE BY TECHNOLOGICAL PARAMETER**

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**Abstract:** The paper examines several examples of visualization common to the contemporary Russian scene, which 1) follow the long tradition of elaborating texts; 2) are developed on the border between the science of geography and visual art; 3) belong to the sphere of amateur production that by trial and error method propose a special 3D filming as a proper way to present an archive. Among other projects concerned with questions of memory work and its visual presentation, it is the latter one that orients itself towards the possibilities of the future.

The technological development knows no boundaries, and in Russia, as well as in other areas, it makes the work of translation of cultural heritage in digital format possible. As usual, local context sets the direction of how visualization technologies would be applied, what parameters would be chosen to structure the process of visualization itself. The following is based on the hypothesis, that Russia's context is in many ways determined by the length of extended territory and «the feeling of space». Accordingly, visualizations often seem to be guided by imagination categories and have map as their principle model. These characteristics form the frame in which IT programmers embed their encoding and build visual presentations of their products.

After the euphoria of the 1990s, the state was to pay attention to cultural heritage. New technologies are being used to register the conditions of various objects that need to be preserved, to predict the future without any premises, as in the case with Zariadievo park pavilion, but often they also reveal for the first time something that was produced dozens of years ago, survived the revolution, underwent the first decades of Soviet era and was nearly forgotten after the war. This is the case with 1) film restoration and 2) stereoscopic cinema. Both are part of long tradition that has an origin in avant-garde movements common to Russia and European counters, and present a normal activity within the visual field today. Digital mixing of color-separated negatives, time-lapse image restoration of color animated films shot according to Soviet tricolor system, such as «Santa Claus and the grey wolf» (Lenfilm studio, 1937), «Winter's tale» (Soyuzmultfilm studio, 1945), «Carnival of flowers» (Soyuzdetfilm studio, two-tone system, 1935) and others, are a part of the transfer work that uses new technologies to open to the public the archive of visual heritage [1]. These films are being presented to public already in the new elaborated form, and it is questionable whether anyone except specialists would be able to watch them in «old», almost unrecognizable form, since current technologies seem to change the habits of viewing and watching dramatically. But this is the question to be asked again on behalf of the last example here.

Another way to use new technologies of visualization is also rooted in the development of film production, this time related to the stereoscopic cinema. An outstanding film director S. Eisenstein was a known connoisseur of stereoscopic cinema, he considered it the technology of tomorrow: «.. this is much dynamic drama! - the interaction of the foreground and depth, from which it actively emerges, breaking the foreground» (1947). He had obviously an experience of watching films of that type, since the first stereo cinema was opened in Saint-Petersburg in 1911; the world's first

glasses-free stereo cinema was opened in Moscow in 1941.

The development of a glasses-free system started at Scientific Cinema-Photo Institute with the use of a raster screen, proposed by the inventor S. Ivanov, in 1937. The raster stereo screen provided the formation of the so-called zones of selective vision of the left and right images of the stereo pair, these zones diverged from the center in a horizontal plane at the level of the eyes of the audience. First films based on Ivanov-system were done with the placement of a stereo pair in the area of one frame of 35mm film. The first film in this system was "The Concert" (director A. N. Andrievsky, cameraman D. V. Rusenski), shot in 1940 and shown on a wire raster screen at the Moscow stereo cinema in 1941, that is, right before the war.

Although now the adherents of stereoscopic cinema exist, seem to have their niche and promote their art of making cinema, touristic products, exhibition design etc., I traced these examples rather to indicate that after avant-garde period they were replaced by visualizations of another type, namely those connected with «written word» in general and literature in particular.

### **Expanding the text images**

The proportion of the visual in the cultural production, perception, and habits needs to be pointed out. On several reasons it's so occurred in Russia by 19<sup>th</sup> century that generally the word had more cultural weight than the image. One could even speculate that historically the visual context was changed so violently for so many times, that it finally affected the way of visual perception itself in such a way, that it can be given only a subordinate role. Apparently, it is necessary to speak about it in the present time, because in some examples it is obvious that it remains so, since the most frequent translations into digital format are the translations of written documents and "great Russian literature".

Therefore, these visualizations are inscribed in what is now called «computational philology». They are being made by institutionalized specialists in philology (though it is claimed that linguists, philologists, historians, culturologists, computer science specialists and media designers work in these laboratories side by side, de facto they unite mainly linguists and philologists). Accordingly, their main interest is still work with texts, and these are texts that they «visualize»: no work of Russian avant-garde artists, video art or Japan manga, but solely manuscripts. The corresponding concept of visualization is quite showing.

I'd like to demonstrate it on the example of Digital Humanities Center, a small branch of the faculty of humanities of Higher School of Economics, Moscow. Organized in 2016, the center declared to work at the intersection of computer methods and knowledge of humanities; with intention to pay special attention to the practice of digital publication, methods of network analysis and computer analysis of literary text, the creation of genre structures and electronic tools for research in humanities.

Their projects include : world map of scripts (the user clicks on certain region on the world map, a side window opens and shows details of the language, alphabet and scripts to be loaded if needed); Persian poetic corps; a parallel presentation of the different translations of the "Poetics" of Aristotle (clicking each section of the text coded in figures opens a file with original version, then 3-4 translations into Russian made in different periods of time, then English and other versions, including Persian; one following the other, loaded in one file, no visualization techniques added ), network analysis of drama and similar others. Their another project is the Easy Linavis Web service that allows to quickly turn text or other data into a graph and explore it using network analysis methods; programming skills are not required.

This laboratory took part in another massive project, "Tolstoy in one click", in collaboration with Samsung Company that developed special apps, and the State Museum of Tolstoy, guided by one of the great-granddaughters of the writer. The level of interaction with the audience was valued as extraordinary (in two weeks people of different professions and age : engineers, IT professionals, doctors, teachers, geologists, linguists, students and other participants from 49 countries read all 90

volumes, or 46,000 pages of the works of L. Tolstoy. At the first stage, the participants had to download ABBYY Fine Reader and check all the texts to eliminate possible errors that occurred during digitization. The second phase of the project involved a more thorough proofreading of the texts. After the third, final proofreading the results were converted to PDF with a text layer, and also in e-book formats .fb2 and ePub), while visual side was, again, very simply organized. Obviously it was not the main task, to make Tolstoy's texts visual, but only to make them readable because downloadable. The main objective of the semantic marking of Tolstoy's electronic publication was to reproduce, at a new technological level, metatext information, critical apparatus, comments and pointers accompanying Tolstoy's complete works edition. What the authors call «interactive graphs of the relationships of the characters of the novels» and «visual analysis» is at best a kind of a static map, or better a diagram where lines are drawn between schematic «portraits» of characters.

Before going further let's fix this connection between visualization and a static map that presents itself in all above mentioned examples: you see the connections between extracted elements when you imagine the novel as a whole, a vast world of all existing languages, or a long treatise. In a way, one does not need this type of visualization if she or he reads attentively and knows what the text is about. The weight of visualization is set by the fact that its object can be seen on the screen of PC, though in its still textual form. It seems to remain a part of a written archive, an archive of utterances, rather than a mediated visualized from that new technologies allow producing.

Nevertheless, there is one more type of examples which on the one hand uses data obtained in different ways (not written text only or pictures exclusively, but necessary archive work) and, on the other, combines it with map-like presentation. This is the case of Dynamic Gulag Map, being done in collaboration with Oxford University, Great Britain. A geographic information site of several regional maps showing how the Gulag shaped the landscape in the Soviet Union's peripheries and of the countless number of people who came through them. The geography of the Gulag was complex and penal institutions were not fixed in time and space, some local places have long since disappeared from site, overgrown by forest; some continue to perform the same role in the present day. «The distinctive geography of prisons demonstrated on this site goes some way to explain why certain elements of past practices still plague the penal system, such as the *etap*, or prisoner transports, that can run into weeks taking up new rights to visit prisoners» [2]. This example is boundary also in the sense, that visualization here is neither an entertainment nor heuristics or epistemic tool: it literary or better formulated, in conventional visual form of several simple maps (and some of them can be applied one onto the other by the viewer) opens the distant land for the viewer's imagination.

Though here, too, a kind of discrepancy between the formulated tasks and final (though changing upon new information being collected) visual form is obvious. As philologists intend to «visually analyze Tolstoy's roman» and do not show how it could be done in their de facto absent visualizations, the organizers of Gulag maps, doing their uneasy project write of «optimal way to represent the data» and «coming to new analytical indicators with the help of spatial analysis methods», and again, restrict themselves a lot with presentation techniques and visualization capacities.

### **Between artistic production and scientific research**

A group of complex visualizations appear at the junction of art and science, namely the science of geography, the emergence of the latter is not surprising if one bears in mind the mapping tendency in visualizations that was already pointed above : S. Gavrilova needs visualization to take the distant peninsula Chukotka from the imagery zone and present it as a "Not-mainland" (the flight Moscow - Anadyr is the longest in the world over the territory of one country); going in the opposite direction a cultural geographer M.Kaluzkov seeks to explain the artistic work by means of the peace of the land where a work of art was created.

S.Gavrilova, a professional geographer and then an artist, a nominee of Kandinsky Art price (2012), spent some years studying various zones of the country: the current state of the territory of the Leningrad blockade ring, empty spaces of the main building of Moscow State University, visually reopened the territory of New Moscow turned into a big construction site. Her video installation "Pits" shows landscapes, built on the scheme of geological samples. Meditative contemplation of landscapes, similar to the content of the "tubes", allows focusing on the very horizon, which is often hidden in the urban areas, but serves a necessary part of our worldview. Landscape panoramas, applied to the mirror surface, offer images to be completed by the viewer, relying only on its visible parts. This work literally explores the emotional sensations that arise because of a forced change of environment, when the viewer tries to complete the picture by only the fragment of it, sweeping away what surrounds her or him at the moment of exhibition.

All together allows understanding the connections between these landscapes and the viewer of the exhibition, and what they are in. According to the artist, thus formalized experience is specific. You cannot see «live» those kinds of landscapes that are presented for viewing, because many of these areas are rebuilt, some wasteland overgrown, some filled with something else. Time passes, and the landscapes change, and those at the exhibition are moments of their existence, which the artist visited, whether she was in Karelia, the Urals or the Far East.

This specific balancing between imagined territories and viewing them «in real time» which necessarily adds to these visualizations a tone of simulative construction, seems to be more appropriate strategy in the land where population long had to invest more in imagination than in memory. On the one hand, people of this land still tend to evade solving the extreme problematic questions of politics : revolution 1917, concentration camps, dissolution of Soviet Union etc., on the other, they do not seem to expose demur against visual activity linked to these events, such as not numerous film representations, posters etc. Probably the answer is that they seem to be more trained to be more or less critical when the text is concerned, and are able to tolerate a lot in the visual sphere, in the sense that visual is not exactly «seen», it is not a part of everyday experience. One of the reasons is that a new proletarian state demanded a «new look» of city streets, new people (no bourgeoisie), new visual system. It was necessary to introduce this system as the best in the world. For example, the famous Moscow subway was not built simply as transportation system, but as an outstanding work of art, a “glee space.” Processes of making visually all new world could be described by the formula, taken from the International, a hymn based on a poem by French poet Eugene Pettier (1871) : «The whole world of violence we destroy to the ground, and then we have ours, we construct a new world ...». This aspect of “destroying to the ground” is to be stressed, as this seems to be a guide to understand how the visual sphere is worked through: this is not just a rejection of old monuments, this is their destruction; physical, material, cleaning “to the ground,” no poetic treatment of ruins, or at least practical use for them; it desired no layers and did not intend to keep any.

Strangely enough the erasure-construction process did not stop, although formally, “Soviet logic” should have ceased to exist after 1991. It renews itself in the desire to erect something new while sweeping away the old, in the belief that the new is better, more modern, and more functional (these three arguments guided the construction of Moscow-City). There seems to be a problem that constant erasures do not allow the gaze to turn back in order to see what it slips upon. These processes made normal the situation in which it is not monuments that trigger the work of memory, but other things – and very often they are private things – which cannot be united into something big and standing on the square, like toys played by two or three generations of family members, or some crockery pieces, or family photo albums. There seems to be no level of commonly accepted visuality.

Thus the elaboration work seems to be done primarily within the sphere of the visual, whatever imagery, and utopian, blind it can be as an objective of cultural heritage preservation. Though Great Russian literature covers a big amount of the cultural worldview, thought it cannot do without

visual technologies today. Though land is important, it cannot produce its own images, since at some places it is still wild and almost undeveloped, at the others it has mixed layers of different often destroyed cultures that need to be reinstated in a manner which would be probably a supplement to “the self-framing of earth” [3,4] and forensic constructions [5]. Therefore a tiny and accurate, preferably indirect work seems to be a proper tactics of visualization. That is why examples similar to Gavrilova’s seem to be showing the slow graduate elaboration of events and their places that not only make look back and remember, but help to watch ahead, and see how they can be unwrapped in the visual sphere today.

### **«To keep or to throw away»: stereo pairs in a 3D-film**

The last example of visualization would be an amateur one that seems to be more striking than professional videos of Gavrilova. Perhaps to some extent unconsciously, it combines characteristics that were outlined above: the restoration of stereo images produced almost a century ago that pose questions of how we are able to percept a technique which is not commonly used today; the relation to the past (not necessarily in the form of memory, but imagery, too), the place of literature, text and «pure visuality», an archive, the simulative construction, and the map. Last but not least this is an example of a vigorous activity directed by images that finally led to a 3D visualization, an active work with the sphere of the visual that is so necessary today.

In the subtitle are put the exact words of the inheritor of the photo archive of Russian photographer S.Chelnokov uttered to explain the main task in a personal talk. The archive consists of more than one and a half thousand glass slides and negatives (mainly stereo pairs) and a series of colored slides in the technique of autochrome, all made between 1880 and 1917; it also includes Taxiphot apparatus for viewing stereo pairs of small format. The collection of autochrome (50 color diapositives) is more than the entire collection of Polytech Museum in Moscow, and this fact is very showing for the intermediate status of this archive : it is somewhere between private and public, between visionary phantasies and documented reality, between garbage and work of art, between two countries, between past and future.

The undecidable status of these images was a riddle for the successor and the inheritor of this archive. He was not working with the visual professionally, not at any level. He never photographed himself or worked for any institution dealing with images, museum or gallery. Furthermore, he had no specific training to be able to watch stereo pair that he inherited. Of course, he has eyes inhabited with modern technologies of making/watching images (iPhone apps etc.). He explained he just couldn't see them because he couldn't figure out what he was seeing — and that's very characteristic. He could not decide what to do with them because it was unclear to him whether they were interesting or should they be thrown away. That is why, out of inquietude, he began to look for ways to watch them collectively.

This is how the story of presenting the Chelnokov archive to the public began, at present moment it includes: an album of printed photographs where each page contains one photograph converted from a stereo pair[ 6], the international conference dedicated to photography in general and Chelnokov archive in particular; an exhibition (September 2017-February 2018, Manage Gallery, Moscow) that consisted of demonstration of several stereo pairs, a (necessary) map of Russia with incorporated stereo pairs indicating places which Chelnokov visited with his camera, and finally a 3D film produced from stereo pairs.

The latter is the most successful way to open Chelnokov's photographs to the wide audience, because on the technical level it creates the space between two photographs of an each chosen stereo pair, and at the same time manages to keep the movement of an eye tracing possible links between figures inside the frame. Certainly this combination was not possible at the beginning of the 20th century. However, it does not come close to the contemporary model of 3D film either, since it does not seem to create a feeling of three-dimensionality in the viewer by kinetics of visual images, though it still has music underneath and background voice pronouncing a kind of literature

narrative loosely connected to the images seen on the screen. It is also a step aside from the cinematic tradition to present a sequence of still photos without travelling («La jetée» (1962) is the most famous in this series). Thus the inheritor of Chelnokov's archive and his colleagues proposed a technology of visualization that uses new media differently: on the one hand, apart from contemporary usage of technology, on the other hand, creating a supplementary view of old photos. This is a way by which a technology allows viewing these photos "for the first time", notwithstanding the fact that they've materially existed during almost a hundred of years.

Of course it is rather a construction, not merely reconstruction; it contains clear signs of «today» manifesting the specific media shift, but exactly this opens new perspectives in what was considered familiar, what was considered "heritage". This constructive converting of Chelnokov's photo archive into specific 3D film makes these stereo pairs a part of contemporary visual field since it is being brought out of oblivion, but in addition this visualization demonstrates how the future can be open as a variable, how the work with the visual by visual technologies can be done.

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