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Virtual Reconstruction of the History of Everyday Life of Kazan Imperial University in the Second Half of the 19th Century

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Abstract: Now a days, the search for new technologies of studying of the history of everyday life becomes more and more popular and one of the most interesting and effective methods that attracts modern scientists' attention is virtual reconstruction. Researchers of Kazan Federal University elaborate new project which deals with the history of everyday life of Kazan Imperial University in the second half of the 19th century. It is suggested to use such information technologies as BDI, Leap Motion, Microsoft Kinect, Oculus Rift and others. Successful project execution will allow to recreate and confirm with the sources external and internal architectural space of the university campus in the second half of the 19th century, "peopling" it with averaged archetypes of students, professors, citizens and others and real historical characters, recreating their living conditions and will let to immerse users as close as possible to the real atmosphere of university life. There are not analogues of such project among virtual reconstructions made by Russian scientists. The novelty of the objectives is that they are either not resolved at all or are not resolved on the appropriative level or the results of the resolving had not been submitted for the scientific community for discussion.

Key words: University's space, virtual reconstruction, virtual heritage, historical science, everyday life, visual studies

INTRODUCTION

Researchers' interest in the history of everyday life of various categories of people increases constantly. In addition scientists search for new technologies, tools and methods of its study. Now a days virtual reconstructions become more and more popular and technologies of their creation improve and become increasingly complex right after complication of consumer's inquiries. It is necessary to include stereo effects, possibilities of non-contact control, creation of multi-agent system, use of technologies of Immersion and gamification and other into the virtual model of object.

The research group from Kazan Federal University elaborates technologies of creation of virtual reconstruction of everyday life of representatives of Kazan University corporation in the second half of the 19th century. Each detail of reconstruction will be confirmed by the corresponding archival sources presented in the form of a structured database and linked to the three-dimensional reconstruction.

The novelty of the project is not only in creation of comprehensive and accessible database of archival sources but also in the innovative method of presenting it. The use of a wide range of information technologies will not simply recreate and confirm with the sources external and internal architectural space of the campus, the appearance of representatives of Kazan University corporation, their living conditions but also will let to immerse users as close as possible to the real atmosphere of university life. Usage of gamification technologies which currently hardly used in historical science will be an undoubtful advantage. They will give an opportunity to see the world of representatives of university corporation from within to understand the meaning or meaning with which they filled it.

Successful realization of this project makes extensive use of the results in scientific, popular science (museum, exhibitions and expositions activity), educational (training courses about university's history, urban culture, etc.) purposes, it will allow to organize the work with historical sources on this subject on the new level, it will give an opportunity to use developed technology both for the reconstruction of everyday life of Kazan University in other periods of history and for other corporations.

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MATERIALS AND METHODS

Complex of methods and technologies (BDI, Leap Motion, Microsoft Kinect, Oculus Rift, Blender, Unity3D, PostgreSQL and other) is used for creation of virtual reconstruction of history of everyday life of Kazan Imperial University in the second half of the 29th century. Such methods and technologies will allow us to get a dimensional reconstruction on some time samples on basis of great number of extant historical sources. This reconstruction will be confirmed by materials of constitutional data base which will be connected with 3D reconstruction. Moreover, with help of our methods it will be possible to immerse user into the environment of provincial Russian university of 19th early 20th centuries, give him opportunity to see these objects from the inside and outside and communicate with characters, take part into everyday life of educational institution.

RESULTS AND DISCUSSION

The history of everyday life is one of the most dynamically developing trends not only in world science but also in national historiography. Moreover, despite the fact that there are many national (Rosenberg, 2010) and Foreign (Boym, 2009; Cowan and Henderson, 2011; Green, 2000) investigations, devoted to different aspects of study of history of everyday life, there are few researches (Vishlenkova *et al*., 2006) connected with university corporations.

Use of three-dimensional modeling techniques by Western historians begins almost simultaneously with the formation of the direction in the early 1990s. Investigations with use of 3D technologies were done in German, Poland, Italy, Great Britain, Switzerland, France (Grellert, 2004; Ryam, 1994; Stever, 1992; Youngblut, 1998).

Among Russian researchers this theme becomes relevant with some delay, since the early 2000s. Almost all the Russian scientists' elaborations in the sphere of historical reconstructions in Russia appeared only in the middle 2000's, when researchers started to reconstruct the castles Ilurat, Tambov and others (Korobov, 2000).

One of the largest modern centers of use of virtual modeling in historical investigations are Technical University (Darmstadt, German), Brown University (USA). In USA, the huge projects of virtual historical reconstruction are project The Herodian Temple at the Davidson Center for Exhibition and Virtual Reconstruction made by American company The Urban Simulation Team at UCLA and project of virtual historical reconstruction of Karnak Temple Complex and tombs of Egypt Pharaohs (Jepson and Friedman, 2012). One of the most important projects of historical reconstruction of cultural monuments in Latin America are projects of reconstruction of Mayan city Bonampak and Indian city Teotihuakan.

There are some centers using virtual technologies in historical studies and educational environment in Russia: Moscow State University, Saint-Petersburg University of Telecommunications named after Bonch-Bruevich, Saint-Petersburg State University, Ural branch of Institute of history and archeology of Russian Science Academy, Tambov state university named after Derzhavin (Borodkin, 2011; Prostov and Zherebyatiev, 2011). The project of historical and cultural Geographic Information system of Bolgar site of Ancient town and territories "Veliky (Great) Bolgar" was elaborated by scientists of Kazan Federal University (Razuvalova and Nizamutdinov, 2015).

In general, the set of tools for 3D modeling of different objects is big enough and complex approach to their use will be undoubted advantage of the project elaborated by scientists of Kazan Federal University. During creating of virtual reconstruction of everyday life of community of Kazan Imperial University special emphasis will be given to the following specific objectives.

Collecting and digitization of the source material on the project in the National archive of the Republic of Tatarstan, Russian State Historical Archive, Department of Manuscripts and Rare Books of the Scientific Library of Kazan University, its analysis and structuring.

Primarily the following groups of sources should be attracted and used for implementation the objectives of the project:

- Plans and projects of the university and its individual buildings and structures that allow to imagine how complex of University grew and mutated where residential, working and economic facilities were located and how they looked like
- Additional important information in this respect is presented by policy documents concerning the construction (reconstruction) university buildings, demolition or re-planning of buildings and urban spaces, filling the university buildings with furniture and equipment their design
- Pictures (lithographs, drawings) of campus facilities of the second half of the 19th century and the representatives of the university corporation
- Sources of personal origin of university people and citizens, showing the spectrum of perception of university space and the university life "inside" and "outside"

- A reflection of the architectural appearance of Kazan University and stories of its everyday life in works of fiction and poetry
- University emblems, symbols, signs, uniforms and other markers of the different periods of its history which will be important for filling the reconstructed model with historical content, correlated with the presented epoch

Creating a three-dimensional models of university buildings, interior details of university facilities (furniture, walls, paintings, etc.) using the collected material, characters, reflecting the average guise of the representatives of the university community (student, teachers, service staff and others), their texturing, normal mapping, reflection mapping, adapting images to the stereo mode. Among actively used instruments of development of three-dimensional models we chose Blender which is the most universal three-dimensional package and includes the following features: three-dimensional modeling, creating UV unwrapping, texturing, editing raster graphics, rigging of models, simulation of liquids, smoke, particles, simulation of the cloth, animation, camera tracking and other. Virtualization will be on the basis of cross-platform game engine unity what helps to solve basic tasks such as rendering three-dimensional models, work with sound and physical processes. Among other things, unity allows to build the process of development so that individual developers can be engaged in the creation of independent modules which will later be united into the final project. Unity works with the most common formats of data storage as well, making its integration during the development process extremely simple.

Creating a database scheme and GUI application based on it which provides simple and quick database administration, allows to add information about each source and identify the entities of in it in database.

Architecture will consist of two interconnected modules. One module will carry out direct work with the database of archival sources and provide a public API to access it. The second module will be implemented on the basis of the game engine unity 3D and it will be a three-dimensional reconstruction of the area of the university with the view from a first-person and the ability to move both in the time between the key moments in history and in space, visiting the various buildings and facilities inside them, looking at objects from different angles. The objects of interest such as architectural and other sights, famous people studied or taught at the university will be highlighted in a special way to indicate to the user the ability to interact with them. Clicking the mouse will display historical reference on such an object with links to all the sources used.

Reconstruction of university spaces as unity 3D scenes, using the created three-dimensional models, creating transitions between scenes, development of GUI, adapted to non-contact system management, its implementation, adaptation scenes for viewing in 3D-mode, implementation of control capabilities for scenes with the non-contact (sensor) control systems.

It is supposed to create immersive environment to make the illusion of immersion into the virtual reconstruction more strong. It is supposed to use such technologies as Leap Motion (control the camera with the motion of the hands), Microsoft Kinect (owning to system including two cameras computer can detect more body movements among other thing movements of hands, legs and head) and Oculus Rift (the device is a sunglasses worn on the head, equipped with a special video screens, so the visual effect of the presence will be created in a space given by the computer).

Description of common schedules of typed subjects based on sources, development of the BDI module, scripts for each element of everyday schedules, clarifying types of characters, adding personalities to the database with binding personalities to these types, revival of scenes by adding characters whose behaviour and appearance will correspond to life of the Kazan Imperial university in the second half of the 19th century.

The extant historical sources allow recreating in details the costumes and attributes peculiar to different types of characters in different chronological periods. In addition to three-dimensional models that reflect the average image of students, teachers, employees and citizens of the second half of the 19th century, characters of specific historical personalities and people, who lived and worked in the university area in the studied period (e.g., professor A.M. Butlerov, professor I.M. Simonov and others, student V.I. Ulyanov and others) will be simulated.

Application of gamification technologies allows the user to see the course of historical events (e.g., gatherings of students of the 1890s and others) to simulate the possible outcomes of an event, take part in the event (for example, “to live” a typical day of a student or a teacher of the Kazan University of the second half of the 19th century and others)

Testing of all software solution modules, stereo and non-contact navigation, installation of the demonstration stand, equipped with complex of three-dimensional screens and equipment for non-contact control.

CONCLUSION

The project on creating of virtual reconstruction of history of everyday life of Kazan Imperial University

intends to use complex of information technologies (BDI, Leap Motion, Microsoft Kinect, Oculus Rift and other). The final product will include 3D models of objects of university's space (buildings, people, etc.) and database connected with historical sources. Technologies of gamification and immersion into virtual reality will allow users to feel themselves as a part of everyday life of Kazan Imperial University in the second half of the 29th century, choose their route in the virtual space of the Kazan Imperial University. Moving inside the buildings, opening various doors, users will become a witness and sometimes a participant of the events reconstructed by us according to the historical sources (the listener of professor's speech acts, the witness of the defense of the thesis, the participant of students' gatherings, etc).

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REFERENCES

Borodkin, L.I., 2011. All-Russian scientific and methodological workshop "The virtual reconstruction of the objects of historical and cultural heritage in the format of the scientific research and educational process". J. Siberian Federal Univ. Hum. Social Sci., 4: 1039-1044.

Boym, S., 2009. Common Places: Mythologies of Everyday Life in Russia. Harvard University Press, London, ISBN: 9780674028647, Pages: 384.

Cowan, E.J. and L. Henderson, 2011. A History of Everyday Life in Medieval Scotland. 1st Edn., Edinburgh University Press, Edinburgh, ISBN-13: 978-0748621576, Pages: 336.

Green, H., 2000. The Uncertainty of Everyday Life, 1915-1945. University Arkansas Press, Arkansas, ISBN: 9781557285980, Pages: 262.

Grellert, M., 2004. Synagogues in Germany: A Virtual Reconstruction. Darmstadt University of Technology, Germany, ISBN: 9783764370305, Pages: 159.

Jepson, W. and S.A. Friedman, 2012. Real-time visualization system for large scale urban environments. White Paper, 1998, The Size and Movement of the Ritual Barks at the Temple of Karnak, Digital Karnak, pp: 1-11.

Korobov, D., 2000. Application of GIS and Aerial Photography in the South of Russia: A Case Study of the Kislovodsk Basin. In: Aerial Archaeology-Developing Future Practice, Bewley, R.H. and W. Raczkowski (Eds.). IOS Press, USA., pp: 122-125.

Prostov, V. and D. Zherebyatiev, 2011. Formation of the source complex for building an interactive virtual reconstruction of the monastery of all who sorrow. Historiogr. Sour. Stud. Natl. Hist., 6: 192-215.

Razuvalova, E. and A. Nizamutdinov, 2015. Virtual reconstruction of cultural and historical monuments of the middle Volga. Proc. Comput. Sci., 75: 129-136.

Rosenberg, N.V., 2010. Everyday Culture: Research Methodology. Publishing House of the Thumb University Press, Tambov, Pages: 200.

Ryan, M.L., 1994. Immersion vs. interactivity: Virtual reality and literary theory. Postmodern Cult., 5: 447-457.

Steuer, J., 1992. Defining virtual reality: Dimensions determining telepresence. J. Commun., 4: 73-93.

Vishlenkova, E.A., S.Y. Malysheva and A.A. Salnikova, 2006. University culture in the rituals, symbols and myths (on materials of the Kazan University). Problems Russian History, 7: 386-417.

Youngblut, C., 1998. Educational uses of virtual reality technology. IDA Document D-2128, Institute for Defense Analyses, Virginia. http://papers.cumincad.org/data/works/att/94ea.content.pdf.