Realization of Information Technology for Sing Language Communication

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There are many deaf people in the world for which tools of teaching and communication needed to create in accordance with modern scientific and technical development. The progress of science, computerization of society, utillizing of multimedia and Internet-technologies are sufficient conditions for creation of the computer systems of communication of these people in forms and offenses, near and clear for them and for all people.

In this report authors are presented information technology for nonverbal communication with the deaf people [1]. Essence of it consists in the recreation of nonverbal communication processes by the virtual models of the real people. The basic requirements to sign language by the spatial models of people of animation process realization are: 1) high dimension of these models (especially human face – because it is needed to reproduce necessary for a sign language emotional and articulation expressions); 2) a model must be skeletal – it need for the generation of skinning all of possible movements; 3) software which will realize the offered technology must work on computers with usual multimedia requirements to hardware; 4) acceptable technology must be offered for forming and sign information transfer by Internet.

Technology for current state of model calculation what allowing to reproduce the process of animation for a realtime show are created. Having regard to those advantages, that: 1) modern computers are completed multi-core processors which to permit paralleling calculable processes and 2) mathematical and informative models for the process of gesture saving and for spatial model built so that the next state does not depend on previous – becomes possible to offer paralleling calculation of the states of model, that sufficient for the process acceleration.

For realization of paralleling calculation the algorithm which consists of $2+n$ streams, where n is an amount of core processors is offered. A fact, that a calculation of different frames is a equivalence problem in terms of processor time independence from model parameters, is utillized. Therefore calculation of κ frames it is possible to divide up on n streams maximally evenly by next method: every *i-th* stream processes frames with a that number, a residue of division of which on n is equal i.

Technology of interactive mediainformation capability on the computer of user-costumer through the Internet is offered. The generalized mean of optimum transfer of dynamic created image in a network the Internet with possibility of controlling is proposed[2]. For this purpose the Web-application with the following functionality is developed: 1) the application server contains the base method of image creation in the memory (for rendering possibility by 3D API in this domain); 2) the methods of dynamic change of this image are realized (change of image format, of image conturing, etc); 3) possibility of the dynamic screening of this image in standard element of HTML-page is realized; 4) exchange protocol between a HTML-page and server for rendering process control is supported (dynamic change of image format, scene rotation, perspective projection change, etc).

References

[1] Yu.G. Kryvonos, Yu.V. Krak, O.V. Barmak [others]. Information technology of unverbal communication of deaf people // Artificial intelligence. – 2008. – № 3. – P. 325–331.(in Ukrainian).
[2] Yu.V. Krak, O.V. Barmak, B.A. Trocenko. Technology of the optimized tranfer of sign language in a network the Internet // Problem of programming. – 2009. – № 3. – P. 73–79. (in Ukrainian).