

Графикон'2003

13<sup>th</sup> International Conference of  
Computer Graphics and Vision  
Moscow State University  
September 5-10, 2003

# Final Program



## Программа конференции

13-я Международная Конференция по  
Компьютерной Графике и Зрению  
Московский Государственный Университет  
5-10 сентября 2003 года

Dear Participant,

We would like to welcome you to the GraphiCon'2003, which is the largest international conference on Computer Graphics between Europe and Asia annually organized in Russian Federation. Following well-established traditions, the 13th event is hosted by Moscow State University on September 5-10, 2003.

This year we have a great program comprising Technical Papers divided into two categories (full and short papers), State-of-the-Art Reports, Multimedia Presentations, Industrial Presentations and Round Tables. Invited talks will be given by Dr. Philip Torr from Microsoft Research and Prof. Martin Reiser from Fraunhofer Institute of Mediacommunication.

The International Program Committee was formed of 33 members representing 11 countries all over the world. Being top experts in the respective areas, all of them have done a tremendous job reviewing on average 3-4 papers out of 37 submitted at full format. Thus, the final decision was based on at least 3 reviews of each manuscript and ended up with 21 works selected for publications in the format of full technical paper. Some of the remaining papers were recommended for publication in a short form after revising. The reviewing procedure was supported by the on-line tracking and monitoring system developed by RL Labs JSC.

This year GraphiCon has not only technical but also educational program consisting of 2 half-day and 2 full-day tutorials and workshops, which will be organized on September 5 and 6. We would like to thank organizers of these tutorials for their willingness to share state-of-the-art knowledge in the respective fields.

We are very glad to notice that the conference is getting more international compared to previous years as we have many great contributions from graphics communities all over the world. Taking this opportunity, we would like to thank all of the authors who contributed to the conference, since without them the event would not be possible.

We would also like to thank our sponsors, Microsoft Research Ltd. and Intel Corp., Organizing Committee, volunteers at Moscow State University, and everyone who made this event happen.

We do hope you will enjoy the conference,



Dr. Yevgeniy P. Kuzmin  
IPC Co-Chair

## Conference At-a-Glance

	Monday, September 8		Tuesday, September 9		Wednesday, September 10	
	Section A	Section B	Section A	Section B	Section A	Section B
8 <sup>30</sup>	Registration		Full Papers 2		Full Papers 5	
9 <sup>00</sup>						
9 <sup>30</sup>	Opening Ceremony		Full Papers (Russian) 2		Short Papers 2	
10 <sup>00</sup>						
10 <sup>30</sup>	Keynote Address		Coffee Break		Coffee Break	
11 <sup>00</sup>	Coffee Break		Full Papers 3		Invited Talk 2	
11 <sup>30</sup>	STAR Report 1					
12 <sup>00</sup>			Lunch		Short Papers 1	
12 <sup>30</sup>						
13 <sup>00</sup>	Lunch		Lunch		Lunch	
13 <sup>30</sup>						
14 <sup>00</sup>	Invited Talk 1		Multimedia Presentation 2		STAR Report 2	
14 <sup>30</sup>	Multimedia Presentation 1		Industrial Presentation 1		Industrial Presentation 2	
15 <sup>00</sup>	Coffee Break		Coffee Break		Closing Ceremony	
15 <sup>30</sup>	Full Papers 1		Full Papers 4		Round Table	
16 <sup>00</sup>						
16 <sup>30</sup>	Full Papers (Russian) 1		Short Papers (Russian) 1			
17 <sup>00</sup>						
17 <sup>30</sup>						
18 <sup>00</sup>	Social Event		Social Event			

## Friday, September 5

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### 10<sup>00</sup>-13<sup>00</sup>: **Media Data Compression**

*Dr. Dmitry Vatolin, Alexander Zhirkov*

*Graphics and Media Lab, CMC, Moscow State University, Moscow, Russia*

Participants of this tutorial will be instructed in the theoretical foundations and practical methods of media data compression. This portion of the tutorial will include common data compression methods, like RLE, BWT, arithmetic compression and PPM. Image compression methods, like JPEG and JPEG-2000 (wavelets), and image lossy compression comparison methods are considered. Video and audio methods will be also described with common compression principles and short description of MPEG-2, MPEG-4, H.263, MP3 and modern methods like H.264 and 3D video compression and hybrid audio compression.

#### **Biographies:**

Dmitry Vatolin, Ph.D, senior researcher, CS MSU Graphics and Media Lab

Specialist in image, video and data compression (fractal image compression, wavelet video compression, fast loss-less data compression, best loss-less video compression) with more than 8 years experience (7 commercial projects). Ph.D. in graphics compression. Studied video and image processing methods for various applications. Application of different mathematical methods, including signal processing methods for postfiltering (deranging, deblocking, loop-filtering), prefiltering (denoising, deinterlasing, rescaling). Books: "Image compression algorithms" (D.Vatolin), "Data compression methods" (D.Vatolin, A.Ratushniak, M.Smironov, V.Yukin); several scientific articles; reports on scientific conferences. Founder of the biggest Russian site with scientific information about data compression [www.compression.ru](http://www.compression.ru).

Zhirkov Alexander, Ph. D. student, researcher, CS MSU Graphics and Media Lab

Specialist in compression area and context modeling. Adaptive Arithmetic/Range coding, Huffman tables. PPM. Set of LZ algorithms. Wavelet compression and transforms. DCT Coding. JPEG-2000 Wavelet-based compression. Also specialized in 3D rendering in areas: Polygonal rendering, Lighting, Shadows, Image Based Rendering, Volumetric, Depth Maps Extraction, Layered Depth Images, 3D Warping, OpenGL, Fractal, Streamed Textured Binary Volumetric Octree with Video, Cascades, Level Of Details, 3D Mip maps.

### 10<sup>00</sup>-18<sup>00</sup>: **Introduction to OpenGL**

*Sergey Berezin<sup>1</sup>, Alexey Ignatenko<sup>2</sup> ([s\\_berezin@cs.msu.su](mailto:s_berezin@cs.msu.su), [ignatenko@graphics.cs.msu.su](mailto:ignatenko@graphics.cs.msu.su))*

<sup>1</sup> *Department of Computational Mathematics and Cybernetics, MSU, Russia*

<sup>2</sup> *Graphics and Media Lab, CMC, Moscow State University, Moscow, Russia*

This tutorial provides an introduction to writing interactive 3D graphics applications using the popular OpenGL Application Programming Interface (API). The course includes general overview of OpenGL architecture as well as description of particular OpenGL commands that allow to create various graphics effects, like lighting, texture mapping, shadows, etc. The course makes use of tutorial programs that allow participants to create interactive 3D scenes step-by-step and immediately see the effect on the rendered image.

The morning session includes the following introductory level topics: overview of OpenGL library, geometry definition, transformations, hidden surface removal, lighting and texturing. The afternoon session includes more advanced topics: blending, shadowing

algorithms, cube maps, vertex and pixel shaders.

The course assumes no previous experience with OpenGL. Ability to understand and write simple C programs and knowledge of computer graphics concepts is advisable.

### **Biographies:**

#### Sergey Berezin, Ph.D

Sergey Berezin received his Ph.D. degree in the field of numerical methods, computer modeling and visualization from Moscow State University where he is currently working as assistant professor and teaches courses on Computer Graphics and Microsoft .NET platform. He also takes part in research grants on computational flow dynamics as specialist in scientific visualization. Research interests include interactive 3D rendering algorithms, hardware accelerated graphics, visual effects, pixel and vertex shaders, mathematical modeling, dynamic search problems, scientific visualization, and modern technologies in object-oriented programming.

#### Alexey Ignatenko

Alexey Ignatenko graduated from Moscow State University (MSU). Currently he is a Ph.D. student at Graphics and Media laboratory. He takes part in research projects on interactive rendering. He is a specialist in image-based rendering, hardware-accelerated visualization and photorealistic rendering. His research interests include 3D rendering algorithms, visibility and occlusion algorithms, point sample and image-based rendering, adaptive rendering, virtual and augmented reality, software engineering.

#### 14<sup>00</sup>-18<sup>00</sup>: **Creating Personalized 3D Heads for Virtual Environments**

*Dr. D. Ivanov ([denis@fit.com.ru](mailto:denis@fit.com.ru))*

*Department of Mathematics and Mechanics, Moscow State University, Russia*

Animated models of a human head are demanded in a large variety of modern applications, including among many others computer games, film production, and video conferencing. However, the problem of the effortless generation of a realistic looking, high quality model has been one of the most difficult in computer graphics, as no general, complete and efficient solution seems yet to be available. In this talk we will present several state-of-the-art approaches that have recently been proposed by the computer science community to solve the problem. These approaches are classified with respect to the data they process in order to build up a personalized 3D head model. Such data may include output of 3D scanning devices as well as one, two or a series of photographic images of a head. We also discuss advantages and drawbacks of the proposed approaches.

### **Biographies:**

#### Dr. Denis Ivanov

Denis Ivanov received his master degree in Mathematics and Ph.D. in Computer Science from Moscow State University, where he is currently working as researcher and project leader at the Laboratory of Computational Methods of the Department of Mathematics and Mechanics. Denis Ivanov has supervised and participated in many successful research projects in the field of Image Processing, 3D Graphics and Computer Vision at MSU and RL Labs JSC. One of these projects aimed at creation of realistic 3D head models from photographs. This research was conducted in the stream of "3D Talking Head" project of Intel Nizhniy Novgorod Lab, *Intel Corp.*

Schedule of coffee and lunch breaks are up to the tutorial organizers.

10<sup>00</sup>-18<sup>00</sup>: **3D Modelling and Animation**

*Dr. Mark W. McK. Bannatyne, Professor Clarke A. Cory, Professor Kellen R. Maicher  
Department of Computer Graphics Technology, Purdue University, USA  
{mwbannatyne, cacory, krmaicher} @tech.purdue.edu*

*Dr. Dmitri I. Troitsky,  
Dept. Of Automated Manufacturing Systems, Tula State University, Russia  
[troitsky@uic.tula.ru](mailto:troitsky@uic.tula.ru)*

This workshop will be conducted in 2 distinct sessions. In the morning session, participants will be instructed in the theoretical foundations of solid and surface models. This portion of the workshops will include creating and editing 3D models on the computer using Rhinoceros using CSG model creation techniques and based on Boolean logic. Surface models will be created by using generative spline 3D surface geometry. Further instruction will be given in how to identify and employ diverse editing practices, building strategies (Revolution, Extrusion, Rail-Revolve, etc), and 2D profile generation used to create 3D models.

The afternoon session of the workshop will be spent working inside 3D Studio Max. Models generated in the morning session will be imported into 3DS and used as the foundational components to practice illustration techniques. During this session participants will also learn how to export databases in several formats, importing techniques and formats, applications of textures, create lighting effects, set camera angles, employ motion rules and translate objects through space, and finally become familiar with several output and presentation formats.

Participants in this workshop do not need to have had any exposure to either Rhinoceros or 3D Studio Max prior to the workshop. This workshop will be taught at the introductory and middle levels.

### **Biographies:**

#### Dr. Mark W. McK. Bannatyne

Dr. Bannatyne is the Acting Head of the Dept. of Computer Graphics Technology at Purdue University. He is a graduate of the British Columbia Institute of Technology (1982), Utah State University (BSc., 1988, MSc. 1992), and Purdue University (Ph.D., 1994). Dr. Bannatyne has spoken extensively throughout the United States, Asia and Europe on the subject of technology's impact in society, the historical aspects of social change due to technology, and computer education courses in the republics of the former Soviet Union. In addition, Dr. Bannatyne has been a member and chair of many international conferences, and has published articles on a wide variety of subjects that deal with issues within technology. Dr. Bannatyne's research agenda includes the problems faced by emerging nations in adapting technological solutions within education and industry.

### Professor Clark A. Cory

Clark is an Assistant Professor in the Department of Computer Graphics Technology at Purdue University. He received a Bachelor of Science in Technical Graphics, and a Master of Science in Education Computing from Purdue University. Clark's primary professional responsibility is undergraduate instruction in architectural and construction graphic communication and visualization. Clark has had over 20 years experience in the AEC industry and his publications include topics on the improvement of cognitive visualization in construction using 3D models, the impact of new technology on the jobsite of construction, and smart house technology. Professor Cory's presentation include national and international conferences and currently teaches courses on 3D modelling in construction, digital lighting and rendering, raster graphics, and animation.

### Professor Kellen R. Maicher

Kellen is a Continuing Lecturer for Interactive Multimedia in the Department of Computer Graphics Technology at Purdue University. In his professional experience he has worked as a multimedia project manager, and as a freelance new media developer. His research interests include educational multimedia, science visualization, animation, and 3D web development. Kellen holds an M.S. in Computer Graphics Technology from Purdue University, as well as a B.S. in both Biology and Computer Graphics Technology.

### Dr. Dmitri I. Troitsky

Dr. Troitsky graduated in 1995 from Tula State University (TSU) with major in Automation. In 1992, he was an exchange student at Tabor College, USA, in May 1998, and defended a Ph.D. dissertation in the area of engineering manufacturing. Since 1995, Dr. Troitsky has been attached to the Dept. of Automated Manufacturing Systems. From 1996 – 1998 he also taught in the Dept. of Design at TSU. In 1997, Dr. Troitsky was appointed International Programs Director of Tula State University and held that appointment through 2001. He has published over 70 papers.

Schedule of coffee and lunch breaks are up to the tutorial organizers.

## Monday, September 8

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10<sup>00</sup>-10<sup>30</sup>: **Opening Ceremony**

10<sup>30</sup>-11<sup>00</sup>: **Keynote Address: 50 anniversary of M.V.Keldysh Institute of Applied Mathematics  
40 years of Computer Graphics in KIAM**

*Dr. Yury Bayakovskiy, Dr. Vladimir Galaktionov  
Keldysh Institute of Applied Mathematics RAS, Russia*

11<sup>30</sup>-12<sup>30</sup>: **STAR Report 1: Reverse Construction of Cultural Heritage**

*Vilbrandt C.<sup>1</sup>, Pasko G.<sup>2</sup>, Vilbrandt T.<sup>1</sup>, Fayolle P.-A.<sup>1</sup>, Kazakov M.<sup>3</sup>, Adzhiev V.<sup>5</sup>, Pasko A.<sup>4</sup>, Kunii T.<sup>2</sup>  
<sup>1</sup>University of Aizu, Japan, <sup>2</sup>IT Institute, Kanazawa Institute of Technology, Japan,  
<sup>3</sup>Digital Media Professionals, <sup>4</sup>Hosei University, Japan, <sup>5</sup>Bournemouth University, UK*

14<sup>00</sup>-15<sup>00</sup>: **Invited Talk 1: Bayesian Methods in Graphics**

*Dr. Philip H.S. Torr  
with A. Blake, R. Cipolla, A. Criminisi, A. Dick, C. Rother, B. Stenger, J. Shotton, and  
A.Thayananathan, Microsoft Research, Cambridge, UK*

15<sup>00</sup>-15<sup>30</sup>: **Multimedia Presentation 1: Talking Head: Synthetic Video Facial Animation in  
MPEG-4**

*Fedorov A., Firsova T., Kuriakin V., Martinova E., Rodyushkin K., Zhislina V.  
Intel Russian Research Center, Nizhni Novgorod, Russia*

16<sup>00</sup>-17<sup>30</sup>: **FPI: Physically Based Simulation**  
**Chair – Ye. Kuzmin**

- 1. Distance Fields for Rapid Collision Detection in Physically Based Modeling**  
*Fuhrmann A.<sup>1</sup>, Sobottka G.<sup>2</sup>, Groß C.<sup>1</sup>  
<sup>1</sup>Fraunhofer Institute for Computer Graphics, Darmstadt, Germany,  
<sup>2</sup>Institute of Computer Science II, University of Bonn, Bonn, Germany*
- 2. Physically-based Particle Simulation and Visualization of Pastes and Gels**  
*Guilbaud C., Luciani A., Castagne N.  
ACROE/ICA, INPG, Grenoble, France*
- 3. A Physically-Based Particle Model of Emergent Crowd Behaviors**  
*Heigeas L.<sup>1</sup>, Luciani A.<sup>2</sup>, Thollot J.<sup>1</sup>, Castagne N.<sup>2</sup>  
<sup>1</sup>Artis project-GRAVIR, CNRS-INPG-INRIA-UJF, Grenoble, France  
<sup>2</sup>ICA Laboratory, INPG, Ministère de la Culture, France*

**FPR1: Image Analysis and Processing**  
**Chair – A. Pereberin**

- 1. Image resampling comparison method and rescaling methods comparison results.**  
*Vatolin D., Putilin S.  
Department of Computational Mathematics and Cybernetics, Moscow State University, Moscow, Russia*
- 2. Current maps update on a basis of regularly incoming images of earth surface**  
*Nepomnyaschy P.V.  
Moscow Institute of Physics and Technology, Moscow, Russia*
- 3. Creation of hierarchical detail tree of image segmentation via solving minimum cut problem**  
*Nepomnyaschy P.V., Yurin D.V.  
Moscow Institute of Physics and Technology, Moscow, Russia*

18<sup>00</sup>: **Social Event – Cheese and Wine Party**

9<sup>00</sup>-10<sup>30</sup>: **FP2: Facial Feature Detection and Reconstruction, Chair - A. Krylov**

1. **Robust and Accurate Eye Contour Extraction**  
*Vezhnevets V., Degtiareva A.*  
*Graphics and Media Lab, CMC,*  
*Moscow State University, Moscow,*  
*Russia*
2. **A Survey on Pixel-Based Skin Color Detection Techniques**  
*Vezhnevets V., Sazonov V., Andreeva A.*  
*Graphics and Media Lab, CMC,*  
*Moscow State University, Moscow,*  
*Russia*
3. **Creating Personalized Head Models from Image Series**  
*Ivanov D., Lempitsky V., Shokurov A., Khropov A., Kuzmin Ye.*  
*Department of Mathematics and*  
*Mechanics, Moscow State University,*  
*Moscow, Russia*

11<sup>00</sup>-12<sup>30</sup>: **FP3: Data Visualization and Compression, Chair – V. Galaktionov**

1. **Texture Advection for 3D Flow Visualization**  
*Anikanov A.A., Potiy O.A.*  
*Computer Center, Rostov State*  
*University, Rostov-on-Don, Russia*
2. **Robust Parameter Estimation for Tone Mapping Operator**  
*Barladian B.*  
*Keldysh Institute of Applied*  
*Mathematics RAS, Russia*
3. **View-Dependent Octree Image Rendering**  
*Zhirkov A.*  
*Graphics and Media Lab, CMC,*  
*Moscow State University, Moscow,*  
*Russia*

**FPR2: Image Synthesis and Processing Chair – D. Vatolin**

1. **Problems of Ray Tracing while Rendering of Crystals**  
*Debelov V.A., Sattarov M.A.*  
*Institute of Computational Mathematics*  
*and Mathematical Geophysics of SB*  
*RAS, Novosibirsk, Russia*
2. **Language for boundary-skeletal representation of binary images**  
*Reyer I.A., Petrovtseva M.A.*  
*Center of Computing n.a.*  
*A.A.Dorodnitsin RAS, Moscow, Russia*
3. **Color bitmap transforms based at B-spline fat curves**  
*Mestetskii L.M., Semenov A.B.*  
*Tver State University, Tver, Russia*

**SP1: Short Papers (Work in Progress Reports), Chair – L. Levkovich-Masluk**

1. **Color Ridges on Implicit Polynomial Surfaces**  
*Bogaevsky I.<sup>1</sup>, Lang V.<sup>3</sup>, Belyaev A.<sup>2</sup>, Kuni T.L.<sup>3</sup>*  
*<sup>1</sup>Independent University of Moscow, Russia*  
*<sup>2</sup>University of Aizu, Japan*  
*<sup>3</sup>Kanazawa Institute of Technology, Japan*
2. **Voxel-Based Terrain Generation Using Scalar Perturbation Functions**  
*Vyatkin S.I., Dolgovesov B.S.*  
*Institute of Automation and Electrometry SB*  
*RAS, Novosibirsk, Russia*
3. **A Framework for Depth Image-Based Modeling and Rendering**  
*Ignatenko A., Konushin A.*  
*Moscow State University, Moscow, Russia*
4. **Statistical Error Model of Active Triangulation Method for CAI**  
*Volodine I.*  
*Moscow State Technical University n.a.*  
*N.E. Bauman, Moscow, Russia*
5. **Feature Tracking in Images and Video**  
*Khropov A.<sup>1</sup>, Shokurov A.<sup>1</sup>, Ivanov D.<sup>2</sup>*  
*<sup>1</sup>Moscow State University, Moscow, Russia*  
*<sup>2</sup>RL Labs JSC, Moscow, Russia*

6. **Image Deblocking With 2-D Hermite Transform**

*Najafi M., Krylov A., Kortchagine D.*

*Moscow State University, Moscow, Russia*

14<sup>00</sup>-15<sup>00</sup>: **Multimedia Presentation 2: VEonPC – Virtual Environment on PC-Linux-cluster: Research, Development and Demonstration**

*Afanasiev V.<sup>1</sup>, Baigozin D.<sup>2</sup>, Brusentsev P.<sup>3</sup>, Bugaev A.<sup>2</sup>, Foursa M.<sup>2</sup>, Frolov P.<sup>3</sup>, Göbel M.<sup>4</sup>, Klimenko S.<sup>5</sup>, Kolomeetz E.<sup>2</sup>, Nikitin I.<sup>3</sup>, Nikitina L.<sup>3</sup>, Reiser M.<sup>4</sup>, Slobodyuk E.<sup>5</sup>, Zhirnov A.<sup>2</sup>*

*<sup>1</sup>Center of Mission Control, Russia, <sup>2</sup>Moscow Institute of Physics and Technology, Russia*

*<sup>3</sup>Institute of Computing for Physics and Technology, Russia, <sup>4</sup>Fraunhofer Institute of Mediacommunication, Sankt Augustin, Germany, <sup>5</sup>Space Research Institute of the Russian Academy of Science*

15<sup>00</sup>-15<sup>30</sup>: **Industrial Presentation 1: Graphics Generation as a means to support Simulation Applications and Synthetic Environment in Alenia Aeronautica**

*Allocca M., Montrucchio C.*

*Systems & Simulation Laboratories, Alenia Aeronautica S.p.A., Turin, Italy*

16<sup>00</sup>-17<sup>30</sup>: **FP4: Modelling and Simulation**  
**Chair – S. Klimenko**

1. **An Architectural Design System for the Early Stages**

*Pranovich S., Wijk J.J.V., Wetering H.V.D.*

*Department of Mathematics and Computer Science, Technische Universiteit Eindhoven, Eindhoven, The Netherlands*

2. **Modeling in 2D Enabling Fluid Stylized Animation**

*Fiore F.D., Reeth F.V.*

*Limburgs Universitair Centrum, Expertisecentrum for Digital Media and Transnationale Universiteit Limburg, School for Information Technology, Diepenbeek, Belgium*

3. **Real-time simulation of water surface**

*Belyaev V.*

*Applied Math. Department, St. Petersburg State Polytechnical University, St. Petersburg, Russia*

**SPRI: Short Papers (Work in Progress Reports)**

**Chair – L. Nesterenko**

1. **Kinematic geometric models in conceptual design**

*Kuchuganov V., Kharin V.*

*Izhevsk State Technical University, Russia*

2. **Continuous skeletal representation of image with controllable accuracy**

*Mestetskii L.M., Reyer I.A.,*

*Tver State University, Tver, Russia*

3. **Human body edge detection in orthopedics**

*Tsibanov V.N., Krylov A.S.*

*Moscow State University, Moscow, Russia*

4. **Lip Reading: Preparing Feature Vectors**

*Soldatov S.*

*Moscow State University, Moscow, Russia*

5. **The self calibrated 3D vision system and analysis of its applicability in robotics and Earth relief recover from satellites images**

*Sveshnikova N.V., Chernyshev N.V., Yurin D.V.*

*MIPT, FGUP Opteks, Moscow, Russia*

6. **Finite-Difference Schemes Design and Optimization by Visualization Methods**

*Bondarev A.*

*KIAM, Moscow, Russia*

18<sup>00</sup>: **Social Event – Conference Banquet**

9<sup>00</sup>-10<sup>30</sup>: **FP5: Geometry Processing**  
**Chair – S. Bazarov**

1. **3D Sketch Stroke Segmentation and Fitting in Virtual Reality**  
*Fiorentino M., Monno G., Renzulli P.A., Uva A.E.*  
*D.Dis – Politecnico di Bari, Bari, Italy*
2. **High-Quality Simplification with Generalized Pair Contractions**  
*Borodin P.<sup>1</sup>, Gumhold S.<sup>2</sup>, Guthe M.<sup>1</sup>, Klein R.<sup>1</sup>*  
<sup>1</sup>*University of Bonn*  
<sup>2</sup>*University of Tübingen*
3. **Target Curvature Based Automatic Fairing of Planar B-Spline Curves**  
*Xu S. H., Li W. S., Zhao G.*  
*Software and Computing Program, Institute of High Performance Computing, Singapore*

**SP2: Short Papers (Computer Graphics Applications), Chair - V. Debelov**

1. **Firmware complex for real-time volume rendering based on VolumePro 1000 accelerator**  
*Dolgovesov B.S., Vyatkin S.I., Shevtsov M.Y.*  
*Ugra Research Institute of Information Technologies, Institute of Automation and Electrometry SB RAS*
2. **Computer-Assistant Design Verification**  
*Inozemtsev A.N.<sup>1</sup>, Troitsky D.I.<sup>1</sup>, Grigorieva N.S.<sup>1</sup>, Bannatyne M.W.McK.<sup>2</sup>*  
<sup>1</sup>*Department of Automated Manufacturing System, Tula State University, Tula, Russia*  
<sup>2</sup>*Purdue University, West Lafayette, Indiana, USA*
3. **Technological Aspects of Development of the Web-trainer on Crystallography**  
*Debelov V.A.<sup>1</sup>, Devyatova A.Yu.<sup>2</sup>, Sattarov M.A.<sup>1</sup>, Smirnov S.Z.<sup>2</sup>, Zhmulevskaya D.R.<sup>3</sup>*  
<sup>1</sup>*Institute of Computational Mathematics and Mathematical Geophysics, Novosibirsk, Russia*  
<sup>2</sup>*United Institute of Geology, Geophysics and Mineralogy SB RAS, Novosibirsk, Russia*  
<sup>3</sup>*Ugra Research Institute of Informational Technology, Khanty-Mansiysk, Russia*
4. **Principles of Automatic Generation And Parsing of Device-Independent Metafiles by the Example of Object-Oriented VTK Library Adaptation**  
*Manakov D., Komarovskiy I.*  
*Institute of Mathematics and Mechanics, Ural State University, Yekaterinburg, Russia*
5. **Visualization of the Distributed Data of Huge Volume. Assembly, Filtration, Sorting.**  
*Manakov D., Mukhachev A., Shinkevich A.*  
*Institute of Mathematics and Mechanics, Ural State University, Yekaterinburg, Russia*

11<sup>00</sup>-12<sup>00</sup>: **Invited Talk 2:**

*Prof. Martin Reiser*  
*Fraunhofer Institute of Mediacommunication, Sankt Augustin, Germany*

12<sup>00</sup>-12<sup>30</sup>: **Multimedia Presentation 3: The System for Interactive Virtual Teaching Based on “Focus” Virtual Studio**

*Dolgovesov B.S.<sup>1</sup>, Morozov B.B.<sup>1</sup>, Shevtsov M.Yu.<sup>1</sup>, Debelov V.A.<sup>2</sup>, Zhmulevskaya D.R.<sup>3</sup>*  
<sup>1</sup>*Institute of Automation and Electrometry, Novosibirsk, Russia,*  
<sup>2</sup>*Institute of Computational Mathematics and Mathematical Geophysics, Novosibirsk, Russia,*  
<sup>3</sup>*Ugra Research Institute of Informational Technologies, Khanty-Mansiysk, Russia*

14<sup>00</sup>-15<sup>00</sup>: **STAR Report 2: Exploring virtual worlds: current techniques and future issues**  
*Plemenos D.*  
*University of Limoges, MSI laboratory, Limoges, France*

15<sup>00</sup>-15<sup>30</sup>: **Industrial Presentation 2: Generating Simple Polygonal Objects From Point Cloud**  
*Turchyn P.*  
*Department of Mathematical Information Technology, University of Jyväskylä, Finland*

15<sup>30</sup>-16<sup>00</sup>: **Closing Ceremony**

16<sup>00</sup>: **Round Table: Scientific Visualization and its practical applications**  
coordinated by Bondarev A.E.  
Keldysh Institute of Applied Mathematics RAS, Russia

Sponsored by  
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Moscow State University and RL Labs JSC

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LABS

Dedicated to 50 anniversary of  
Keldysh Institute for Applied Mathematics of RAS



In cooperation with  
Eurographics Association



### Organizing Committee:

Co-Chairs: Yuri Bayakovskiy  
Eugene Shikin

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Печатается по постановлению Редакционно-издательского совета факультета Вычислительной математики и кибернетики Московского государственного университета им. М.В. Ломоносова