**1 December. ISPRAS Open 2016**

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| 08:30-09:30 | Registration (BLUE HALL) |

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| 09:30-09:50 | **Opening and greetings:**<br>Prof. Victor P. Ivannikov, Academician, Scientific Head of ISP RAS<br>Prof. Valery V. Kozlov, Academician, Vice President of the Russian Academy of Sciences<br>Alexey M. Medvedev, First Deputy Head, Federal Agency for scientific organizations |
| 09:50-10:10 | Prof. Arutyun I. Avetisyan, Corresponding member of RAS, Director of ISP RAS<br>**ISP RAS - Ecosystem of innovations** |
| 10:10-10:30 | Vitaly S. Lyutikov, Deputy Director, Federal Service for Technical and Export Control (FSTEC)<br>**"Secure software development as an essential basis for information security"** |
| 10:30-10:50 | Sergei V. Garbuk, Deputy General Director, Advanced Research Fund, Ph.D.<br>**"Modern challenges of system and application programming in defense industry"** |
| 10:50-11:10 | Dr. Chul-Joo Kim, Software R&D Center Samsung Electronics<br>**"Samsung SW R&D Directions"** |
| 11:10-11:30 | Dr. Li Jiang, Director of Huawei Russian Research Center<br>**"Inspiring ICT Innovations with Mathematics"** |
| 11:30-11:50 | Mikhail Orlenko, Director, Enterprise Solutions Group at Dell<br>**"Dell EMC solutions and technologies for distributed systems"** |

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| 11:50-13:00 | ISP RAS Technologies Showcase (p. 6) |

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| 13:00-14:00 | Lunch |

| TECHNOLOGIES OF PROGRAM ANALYSIS, MODELING AND TRANSFORMATION (BLUE HALL) | |
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| 14:00-14:40 | Andrey Belevantsev (ISP RAS, Russia)<br>**"Static analysis techniques in security software development lifecycle: requirements, problems, features"** |
| 14:40-15:00 | Evgeniy Ryzhkov, Andrey Karpov ("Program Verification Systems" LLC, Russia)<br>**"Operation principles of PVS-Studio static code analyzer"** |
| 15:00-15:20 | V.K. Koshelev (ISP RAS, Russia)<br>**"Formalization of Error Criteria for static symbolic execution"** |

| DISTRIBUTED SYSTEMS AND INFORMATION SYSTEMS BASED ON OPEN DATA (GREEN HALL) | |
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| Distributed Systems (Denis Turdakov) | |
| 14:00-14:40 | Konstantin Osipov (Tarantool, Russia)<br>**"Write optimized storage design using Vinyl storage engine in Tarantool as an example"** |
| 14:40-15:00 | Dmitriy Kolmakov, Konstantin Knizhnik, Adel Chepkunov, Alexander Slesarenko (Huawei)<br>**"Speed-up Spark applications by offloading computation to native kernels"** |
| 15:00-15:20 | Oleg Borisenko (ISP RAS, Russia)<br>**"Scalability problems in Openstack Keystone and their solution approach"** |

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| 15:20-15:40 | A.V. Kogtenkov (ETH Zürich)<br>**"Mechanically Proved Practical Local Null Safety"** |
| 15:40-16:00 | Coffee break |
| 16:00-16:20 | I. Dudina (CMC MSU, Russia)<br>**"Inter-procedural buffer overflows detection in C/C++ source code via static analysis"** |
| 16:20-16:40 | D. Bocharnikov (Samsung Electronics Co., Ltd.)<br>**"Solving problems of dynamic languages debugging with C# debugger on Tizen platform as an example"** |
| 16:40-17:00 | P.S. Andrianov, V.S. Mutilin, A.V. Khoroshilov (ISP RAS, Russia)<br>**"Adjustable method with predicate abstraction for detection of race conditions in operating systems"** |
| 17:00-17:20 | R.R. Mulyukov , A.E. Borodin(ISP RAS, Russia)<br>**"Using unreachable code analysis in static analysis tool for finding defects in source code"** |
| 17:20-17:40 | A.R. Nurmukhametov(ISP RAS, Russia)<br>**"The Application of Compiler-based Obfuscation and Diversification for Program Signature Modification"** |
| 17:40-18:00 | K. Dolgorukova, S. Arishin(ISP RAS, Russia)<br>**"Link-time optimization speedup"** |
| 18:00-18:20 | R.A. Buchatskiy, E.Y. Sharygin, L.V. Skvortsov, R.A. Zhuykov, D.M. Melnik, R.V. Baev(ISP RAS, CMC MSU, Moscow Institute of Physics and Technology)<br>**"Dynamic compilation of SQL queries for PostgreSQL"** |

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| 15:20-15:40 | Andrey Chernyh (CICESE Research Center, Ensenada, Baja California, Mexico)<br>**"Towards a Cloud Computing Paradigm for Big Data Analysis in Smart Cities"** |
| 15:40-16:00 | Coffee break |
| Complex Networks Analysis (Anton Korshunov) | |
| 16:00-16:20 | Mikhail Drobyshevskiy, Anton Korshunov and Denis Turdakov (ISP RAS, Russia)<br>**"Parallel modularity computation for directed weighted graphs with overlapping communities"** |
| 16:20-16:40 | Dmitriy Ignatov, Alexander Filippov, Andrey Ignatov, Xuecang Zhang (Russian Research Center, Huawei Technologies,Russia; Swiss Federal Institute of Technology in Zurich, Department of Computer Science, Switzerland)<br>**"Automatic Analysis, Decomposition and Parallel Optimization of Large Homogeneous Networks"** |
| 16:40-17:00 | Andrey Gomzin (ISP RAS, Russia)<br>**"A method for automatic age detection based on social graph"** |
| 17:00 - 17:20 | Julia Trofimovich, Ilya Kozlov, Denis Turdakov (ISP RAS, Russia)<br>**"Approaches to estimate location of social network users based on social graph"** |
| Text Analysis and Machine Learning (Nikita Astrakhantsev) | |
| 17:20-17:40 | Konstantin Kazakov, Vitaliy Semenov (ISP RAS, Russia)<br>**"Planning movement in dynamic global environment"** |
| 17:40-18:00 | Dmitry Ustalov (Krasovskii Institute of Mathematics and Mechanics, Russia)<br>**"Inducing a Thesaurus Structure by Joining Dictionaries and Word Embeddings"** |
| 18:00-18:20 | Ilseyar Alimova, Valery Solovyev and Ildar Batyrshin (Kazan Federal University, Russia; Instituto PolitecnicoNacional, Mexico)<br>**"Comparative analysis of the measures based on the transformation of moving approximations in problems of classification of time series"** |
| 18:20-18:40 | Daniil Mashkin, Evgeny Kotelnikov (Vyatka State University, Russia)<br>**"Aspect term extraction based on word embedding and conditional random fields"** |

**2 December. ISPRAS Open 2016**

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| 08:30-09:30 | Registration (BLUE HALL) |

| TECHNOLOGIES OF PROGRAM ANALYSIS, MODELING AND TRANSFORMATION (BLUE HALL) | |
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| 9:30-10:10 | V. P. Ivannikov, (ISP RAS, Russia)<br>**"Modern binary code analysis challenges and trends"** |
| 10:10-10:50 | A.N. Fedotov, V.A. Padaryan, V.V. Kaushan, Sh.F. Kurmangaleev, A.V. Vishnyakov, A.R. Nurmukhametov(ISP RAS, Russia)<br>**"Severity software defects estimation in presence of modern defense mechanisms"** |
| 10:50-11:30 | A.Y. Gerasimov, L.V. Kruglov(ISP RAS, Russia)<br>**"Input data generation for reaching specific function in program by iterative dynamic analysis"** |
| 11:30-11:50 | Coffee break |
| 11:50-12:10 | K.M.Lavrischeva, A.K.Petrenko (ISP RAS, Russia)<br>**"Software Product Lines Modeling"** |
| 12:10-12:30 | A.V. Vishnyakov, (ISP RAS, Russia)<br>**"Classification of ROP gadgets"** |
| 12:30-12:50 | V.V. Kaushan, (ISP RAS, Russia)<br>**"Buffer overrun detection method in binary code"** |
| 12:50-13:10 | M.A. Klimushenkova, M.G. Bakulin, V.A. Padryan(Novgorod State University, ISP RAS, Russia)<br>**"On Some Limitations of Information Flow Tracking in Full-system Emulators"** |

| OPEN SOURCE SOFTWARE IN CONTINUUM MECHANICS PROBLEMS SOLVING (GREEN HALL) | |
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| 9:30-10:10 | Prof. Hrvoje Jasak (Wikki, United Kingdom and Germany, Faculty of Mechanical Engineering and Naval Architecture University of Zagreb, Croatia)<br>**"Numerics Improvements in OpenFOAM with Examples of Industrial CFD Applications "** |
| 10:10-10:50 | J.M. Redondo (Dept. Fisica, UPC Barcelona Tech, Barcelona, Spain)<br>**"SAR Analysis of the ocean surface: Application to marine pollution and detection of dynamic features"** |
| 10:50-11:30 | I. Tkachenko, N. Tryaskin, S. Chepurko (State Marine Technical University of St.Petersburg, Russia)<br>**"The experience of the applying the open-source software in ship hydrodynamics"** |
| 11:30-11:50 | Coffee break |
| 11:50-12:10 | D. Romanova (Lomonosov Moscow State University, Russia)<br>**"3D flow modeling of Herschel-Bulkley fluid on the slope in OpenFOAM"** |
| 12:10-12:30 | A. Epihin (Bauman Moscow State Technical University, Russia)<br>**"Numerical schemes for simulations turbulent flows using eddy-resolving models and the OpenFoam software package"** |
| 12:30-12:50 | M. Banholzer (Institute for Thermodynamics, Universität der Bundeswehr München, Germany)<br>**"A computational study of the influence of real-gas effects in under-expanded hydrogen and methane jets"** |
| 12:50-13:10 | E. Smirnova (ISP RAS, Russia)<br>**"The validation of open-source code Gerris on the problems of hydrodynamic instabilities"** |

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| 13:10-14:10 | Lunch |
| 14:10-14:30 | K.A. Batuzov(ISP RAS, Russia).<br>**"Global register allocation during dynamic binary translation"** |
| 14:30-14:50 | N. A. Belov, (ISP RAS, CMC MSU, Russia)<br>**"Automatic uninitialized value usage detection during full-system emulation"** |
| 14:50-15:10 | P. Dovgalyuk, V. Makarov(Novgorod State University, Russia)<br>**"When stack protection does not protect the stack?"** |
| 15:10-15:30 | H.K. Aslanyan, S.F. Kurmangaleev, V.G. Vardanyan, M.S. Arutunian, S.S. Sargsyan(ISP RAS, Russia)<br>**"Platform-independent and scalable tool for binary code clone detection"** |
| 15:30-15:50 | A.S. Kamkin, A.M. Kotsynyak, A.D. Tatarnikov, M.M. Chupilko, (ISP RAS, Lomonosov Moscow State University, Moscow Institute of Physics and Technology, Russia)<br>**"MicroTESK-Based Test Program Generator for the ARMv8 Architecture"** |
| 15:50-16:10 | Coffee break |
| 16:10-16:30 | I.A. Yakimov, A.S. Kuznetsov (Siberian Federal University, Russia)<br>**"Test Readability Optimization in Context of Symbolic Execution"** |
| 16:30-16:50 | A.Y. Hmelnov , I. V. Bychkov, A.A. Mikhaylov. (Matrosov Institute for System Dynamics and Control Theory of the Siberian Branch of the Russian Academy of Sciences, Russia)<br>**"A declarative language FlexT for analysis and documenting of binary data formats"** |
| | A. I. Get'man, Yu. V. Markin , D. O. Obydenkov, V. A. Padaryan, A. Yu. Tikhonov(ISP RAS, Russia)<br>**"Methods of presenting the results of network traffic analysis"** |

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| 13:10-14:00 | Lunch |
| 14:10-14:30 | P. Lukashin (ISP RAS, Russia), S. Strijhak, (ISP RAS, Russia), G. Shcheglov (BMSTU, Russia)<br>**"Validation of open source code BEM ++ for simulation of acoustics problems"** |
| 14:30-14:50 | I. Evdokimov, M. Kalugin ("Aviatica", ISP RAS, Russia)<br>**"Numerical study of characteristic modes and frequencies of flow in high speed compressors"** |
| 14:50-15:10 | Yu. Kornienko (ROSATOM-CICE&T, Russia)<br>**"Analytical quasi-one-dimensional method and criteria for the transition from 2D / 3D to 1D models for simulation of non-equilibrium two-phase turbulent flows dynamics"** |
| 15:10-15:30 | E. Varseev (IPPE, Russia), Yu. Kornienko (ROSATOM-CICE&T, Russia)<br>**"Numerical study of saddle-shaped void fraction profiles effect on thermal hydraulic parameters of the channel with two-phase flow using OpenFOAM and comparison with experiments"** |
| 15:30-15:50 | M. Galanin, V. Lukin, A. Rodin (Keldysh Institute of Applied Mathematics RAS, Russia)<br>**"Software platform Temetos for computational experiment support: architecture and solvers"** |
| 15:50-16:10 | Coffee break |
| 16:10-16:25 | A. Bondarev (Keldysh Institute of Applied Mathematics RAS, Russia), A. Kuvshinnikov (Lomonosov Moscow State University, Russia)<br>**"Comparison of OpenFOAM solvers for flow past a cone problem"** |
| 16:25-16:40 | V. Puzikova (Bauman Moscow State Technical Univercity, Russia)<br>**"The LS-STAG Immersed Boundary Method Modification for Viscoelastic Flow Computations"** |
| 16:40-16:55 | V. Korchagova (ISP RAS, Russia)<br>**"An Implementation of Hybrid CFD/BEM Technology For Prediction Acoustic Environments Using Open-Source Software"** |

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| 16:55-17:10 | O. Kotsur, V. Melnikova, G. Shcheglov (Bauman Moscow State Technical University, Russia) **"Numerical simulation of the flow in the flow rate regulator valve using OpenFOAM"** |
| 17:10-17:25 | A. Nuriev (Kazan Federal University, Russia), A. Yunusova (Kazan National Research Technological University, Russia), O. Zaitseva (Kazan Federal University, Russia) **"Simulation of the wedge-shaped vibration-driven robot motion in the viscous fluid forced by different laws of internal mass movement in the package OpenFOAM"** |
| 17:25-17:40 | K. Kuzmina and I. Marchevsky (Bauman Moscow State Technical University, Russia) **"On computational complexity of vortex element method for 2D incompressible flows simulation"** |
| 17:40-17:55 | P. Fraunnie (MIO Toulon Univerity, France) **"Fast 3D parallel numerical model for air-sea interface including breaking waves and floating bodies"** |

**1 December 2016. ISP RAS Technologies Showcase (presentations, demos)**

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| Stand 1 | **Svace.** Svace is the production static analysis tool for finding wide range of critical errors, vulnerabilities, and source code defects for programs written in C/C++, Java, and C#. |
| Stand 2 | **Obfuscating program code**. Program obfuscation is the process of transforming its source or binary code such that the further program analysis, modification, or understanding becomes complicated, while fully retaining the program functionality. |
| Stand 3 | **Protosphere.** Protosphere is network traffic analysis system |
| Stand 4 | **Detecting program errors and vulnerabilities.** Technologies of runtime program error and vulnerability detection |
| Stand 5 | **Binary code analysis tools.** |
| Stand 6 | **SharpChecker.** SharpChecker is the static analysis tool for automatic defect and vulnerabilities detection in program source code. It is developed for C# engineers and their managers. SharpChecker allows them to find source code defects as well as to track quality of the product being developed. |
| Stand 7 | **AstraVer.** A toolset for deductive verification of operating system security models |
| Stand 8 | **LDV/Klever:** a technology for static verification of Linux kernel drivers. |
| Stand 9 | **Verification of Digital Hardware: Retrascope and MicroTESK** |
| Stand 10 | **MASIW.** Modular Avionics System Integrator Workplace. |
| Stand 11 | **Texterra.** Texterra is a technology for automatic ontologies construction and text mining. It provides infrastructure for extracting knowledge from a variety of Internet resources, knowledge management system and tools for natural language processing. |
| Stand 12 | **TALISMAN:** Tracking and Learning Insights from Social Media Analysis<br>A technology for social media analysis based on machine learning, computational linguistics, complex network analysis, and big data processing. |
| Stand 13 | **ISP RAS Private Cloud** |
| Stand 14 | **Constructivity.** Technology of modeling and analysis of large dynamic scenes. Technology is intended for the development of advanced software applications of computer graphics, scientific visualization, animation, robotics, geoinformatics, logistics, computer aided design, visual planning and project management facing big spatial-temporal data problems. |
| Stand 15 | **Cloud infrastructure for life cycle support of Tizen.Ru operating system** |

**2 December 2016. Interactive session. Open source software in continuum mechanics problems solving**

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| N. Dimitrieva (Institute of Hydromechanics, National Academy of Sciences of Ukraine, Ukraine)<br>**"The numerical solution of the wedge flow problem in stratified fluid using OpenFOAM"** |
| I. Boychuk (Belgorod State Technological University named after V.G.Shoukhov)<br>**"Simulation of Flow Through the Propeller"** |
| V. Ovchinnikov (LADUGA Automotive Engineering, Bauman Moscow State Technical University, Russia), E. Avdeev (Samara University, LADUGA Automotive Engineering, Russia), K. Volkova (Togliatti State University, Russia)<br>**"An analytical model of rolling tapered roller bearing"** |
| V. Kurashov (Moscow Institute of Physics and Technology, Central scientific research institute for technology and mechanical engineering, Russia)<br>**"New tabular thermodinamic library with model of equilibtium air for OpenFOAM and RapidCFD"** |
| J. Nagy (Johannes Kepler University Linz), R. Almenar (ESI Group), F. Mendonça (Johannes Kepler University Linz), S. Strijhak (HP, ISP RAS)<br>**"Where can i start with OpenFOAM?"** |
| K. Koshelev, S. Strijhak (ISP RAS, Russia)<br>**"Development of thermodynamic library taking into account real properties of gases mixture"** |
| J.M. Redondo (Dept. Fisica. UPC Barcelona Tech, Barcelona, Spain), J.D. Tellez (Dept. Fisica. UPC Barcelona Tech, Barcelona, Spain), J.M. Sanchez (BEROTZA S.L., Noain, Pamplona, Navarra, Spain)<br>**"Turbulent convection driven by thermoelectricity in a cooling-heating didactive device"** |
| C.E. Leyton-Pavez, J.M. Redondo, J.D. Tellez-Alvarez, J.C. Gil-Martín (UPC Barcelona Tech, Barcelona, Spain)<br>**"Fractal Analysis of Growing Cities and its Relationship with Health Centre Distribution"** |