Program

of the IEEE International Conference

«Video and Audio Signal Processing in the Context of Neurotechnologies»

June 26 – June 30
2017

St.Petersburg, Russia

Organizing committee

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Working languages: Russian, English

Invited Speakers

Narisa Nan Chu

CE Soc Representative to IEEE Brain Initiative & Sensors Council, USA

From neutrons, electrons, to Neurons

Alexander Shepovalnikov

Professor, Honored Worker of Science of the Russian Federation
Sechenov institute of evolutionary physiology and biochemistryRussian academy of sciences,
St. Petersburg, Russia

Visualization of interregional relationships spatiotemporal organization in EEG-study

Nikolai Rozanov

Professor, Corresponding Member of Russian academy of sciences,
Department of Laser Optics, *Vavilov State Optical Institute*
St. Petersburg, Russia

Topological 3D-dissipative optical solitons

Monday, June 26, 2017

IEEE Brain Data Bank Challenge 2017
Brain Signal – Visualization & Analytics
day 1

Location: Pravda Street, 13, St. Petersburg State University of Film and Television

Moderators**:**Narisa Nan Chu, MalakhovaKaterina, ShelepinEvgenii

10.00-10.30	**Registration for Challenge participants**
10.30-11.00	**Introduction and Team Positioning**
11.00-13.00	**Tutorials on brain signal database access**
13.00-14.00	**Lunch**
13.00-14.00	**BCI headset loans for on-site data collection** (Individual teams can bring their own equipment. Please manage your time limitation)
15:00 – late night and next day 2	**Working**

day 2,
Tuesday, June 27, 2017

Location:Makarovaemb. 6, Conference hall, Pavlov Institute of Physiology

09.00-10.00	Discussion and preparation for presentations
10.00-11.30	Presentation of the results

IEEE International Symposium «Video and audio signal processing in the context of Neurotechnologies», SPCN-2017

Location: Makarovaemb. 6, Conference hall, Pavlov Institute of Physiology

11:30-12:00	**Registration for Symposium participants**
12:00-12:15	**Symposium Official opening ceremony** **Welcome word from organizers** **Konstantin Glasman**, Chair, Video/Multimedia Committee, IEEE Consumer Electronics Society, Member of IEEE.tv Advisory Committee, **Yuri Shelepin**, Head of the laboratory of vision physiology, Pavlov Institute of Physiology, Russian Academy of Sciences
12:15-12:45	**From neutrons, electrons, to Neurons** Narisa Nan Chu, CE Soc Representative to IEEE Brain Initiative & Sensors Council, USA
12:45-13:30	**Visualization of interregional relationshipsspatiotemporal organization in EEG-study**

AlexanderShepovalnikov, professor, Sechenov institute of evolutionary physiology and biochemistry russian academy of sciences, St. Petersburg

13:30-15:00 **Judging decision and Lunch**

15:00-15:30 **The awards presentation. Winner's reward ceremony**

15.30-19.00	Talk session 1 **Signal Processing** Moderators**:**Harauzov Alexey,Yakimova Elena

15:30-15:50 **Extracting the characteristics of event-related EEG dynamics in the visual GO/NOGO task using Parallel Factor Analysis.**
Ponomarev V.A., KropotovYu.D., N.P. Bechtereva Institute of the Human Brain Russian Academy of Sciences, St. Petersburg

15:50-16:10 **Measurement and computer animation of phase shifts in EEG**
BelovDmitriy, St. Petersburg State University, Department of psychophysiology, St. Petersburg

16:10-16:30 **Justification of the use of empirical mode decomposition for the processing of bioelectrical signals in the time-frequency domain: ECG, EEG, EMG**
Altay Yeldos, ITMO University, St. Petersburg

16:10-16:30 **Coffee break**

16:30-16:50 **Latent components of ERPs in Go/NoGo tests**
Pronina M.V., Ponomarev V.A., Kropotov J.D., N.P. Bechtereva Institute of the Human Brain Russian Academy of Sciences, St. Petersburg

16:50-17:10 **Transcallosal neural networks: development and pathologies**
Krasnoschekova E.I.,St. Petersburg State University, St. Petersburg

17:10-17:30 **Power and shift invariant detection of dynamically coupled networks (PSIICOS) from non-invasive MEG data**
AltukhovDmitrii, Ossadtchii Alex, Higher School of Economics, faculty of computer science; center for cognition and decision making; MSUPE, MEG-Center, Moscow

17:30-17:50 **Development of the technology of microwave encephalography (MVEG) for the diagnosis of nervous diseases and mental disorders of the human brain, the study of human activity in the norm and the organization of a new type of neuro-computer interface**
Brusilovsky Leonid, The radio-relay association APORRS, Moscow

17:50-18:10 **Development of a method for increasing noise immunity in the filtration of phonocardiograms**
Aimukhanbetov E., Koishybaev D., Serikkazhieva R., ITMO University, St. Petersburg

18:10-18:30 **Peculiarities of understanding texts by students of the third and ninth grades with different levels of intelligence**
ShvetsovaAnastasia, St. Petersburg State University, St. Petersburg

18.30-18.50 **Noise robust processing of a speech signal in robot control tasks**
Abdulkhairov M.T., Koishybaev D.N., ITMO University, St. Petersburg

Wednesday, June 28, 2017

IEEE International Symposium «Video and audio signal processing in the context of Neurotechnologies», SPCN-2017

Location: Makarovaemb. 6, Conference hall

10.30-11.00	**Registration for Symposium participants**
11.00-12.00	**Topological 3D-dissipative optical solitons** Nikolai Rozanov, Professor, Corresponding Member of Russian Academy of Sciences,Department of Laser Optics, Vavilov State Optical Institute, St. Petersburg
12.00-12.00	Talk session 2 **Artificial neural networks** Moderators**:** Bondarko Valeria, Malashin Roman,
12.00-12.20	**Neural networks as a tool for forecasting innovation activity** Korableva Olga[1], Erofeeva Kristina[2], [1]ITMO University, [2]St. Petersburg State University, St. Petersburg
12.20-12.40	**Representation of high-level visual information in biological and artificial neural networks** MalakhovaKaterina, Pavlov Institute of Physiology, Russian Academy of Sciences, St. Petersburg
12.40-13.00	**Regularities of animate and inanimate objects in artificial Neural Networks** MalashinRoman, Pavlov Institute of Physiology, Russian Academy of Sciences, St. Petersburg
13.00-13.20	**MODELLING OF THE PSYCHOPHYSICAL EXPERIMENTS RESULTS BY NEURAL NETWORKS** Bondarko VM, Bondarko DV, Solnushkin SD, Chikhman VN, Pavlov Institute of Physiology, Russian Academy of Sciences, St. Petersburg
13.30-15.00	**Poster sessionpresentation** TED presentation (in 1 min) of posters **Coffee break&POSTER SESSION**
15.00-18.00	Talk session 3 **Biological neural networks** Moderators**:** MalakhovaKaterina, Zhukova Olga
15.00-15.20	**The neural basis for absolute disparity coding in the primary visual cortex** AlekseenkoSvetlana, Pavlov Institute of Physiology, Russian Academy of Sciences, St. Petersburg
15.20-15.40	**Influence of the foveola size on the characteristics of the evoked potentials in image**

recognition tasks

Moiseenko[1] G.A., Vahrameeva[1] O.A., Maltsev[2] D.S., Koskin[2] S.A., Shelepin[1] Y.E., [1]Pavlov Institute of Physiology, Russian Academy of Sciences. [2]Department of ophthalmology; S. M. Kirov Military Medical Academy, St. Petersburg

15.40-16.00 **EEG of rhesus monkeys in resting-state conditions and under photic stimulation**

HarauzovAlexey, IvanovaLubov, Varovin Ivan. Pavlov Institute of Physiology, Russian Academy of Sciences, St. Petersburg

16.00-16.20 **Cryptogenic epilepsy. Resting-state functional MRI study**

Sokolov A.V.[1,2], Efimtcev A.Yu.[1,2], Semibratov N.N.[2], Zhukova O.V.[3], Vasilyev P.P.[3], Shelepin Yu.E.[3], Fokin V.A.[1,2,]Trufanov G.E.[1,2]1 - Federal North-West Medical Research Centre. 2 - Military Medical Academy n.a. S.M. Kirov. 3- Pavlov Institute of Physiology, Russian Academy of Sciences

16.20-16.40 **Fractal analysis in post-processing of tomographic images**

MarusinaM.Ya., ITMO University, St. Petersburg

16.40-17.00 **The neural substrates of the auditory biological motion analysis are multimodal areas of cortex**

Orlov V.A.[1], Ushakov V.L.[1], Kartashov S.I.[1], Gvozdeva A.P.[2], Andreeva I.G.[2], [1]NRC "Kurchatov Institute", Moscow, Russia. [2]Sechenov Institute of evolutionary physiology and biochemistry of the Russian Academy of Sciences, St. Petersburg, Russia

17.00-17.20 **Algorithms and software for detecting neurons in images of the cat's spinal cord slices**

Bakhshiev A.V., Mikhailov V.V., Merkulyeva N.S., Veshchitskii A.A., Musienko P.E. The Russian State Scientific Center for Robotics and Technical Cybernetics, St. Petersburg

17.20-17.40 **Analysis of the microcirculatory pathway of the macular area of the retina using optical coherence tomography-angiography**

Maltsev[1] D.S., Kulikov[1] A.N., Vakhrameeva[2] O.A., Burnasheva[1] M.A., [1] Department of ophthalmology; S. M. Kirov Military Medical Academy. [2] Pavlov Institute of Physiology, Russian Academy of Sciences, St. Petersburg

17.40-18.00 **Foveola and foveolar avascular zone diameter measurement and comparison using enface images of the fundus and line scans obtained with spectral domain optical coherent tomography**

Vakhrameeva[1] O.A., Maltsev[2] D.S., Kovalskaya[2] A. A., Sukhinin[2] M.V., Koskin[2] S.A., Shelepin[1]Y.E. [1]Pavlov Institute of Physiology, Russian Academy of Sciences. [2]Department of ophthalmology; S. M. Kirov Military Medical Academy, St. Petersburg

Poster session

Wednesday, June 28, 2017

14.00 – 15.30

Location: Makarovaemb. 6, Entrance hall, 2nd floor

Moderators:Vakhrameeva ., Petropavlovskaia E.A.,

1. Agaeva Maria. **Echo thresholds in horizontal plane for stationary and moving lagging signals.** Pavlov Institute of Physiology, RussianAcademyofSciences, St. Petersburg
2. AleksandrovA.A., UplisovaK.O.,IvanovaV.Yu.**Visually evoked emotional reaction recognition based on physiological tremor acquisition.** St. Petersburg State University, St. Petersburg
3. Cherenkova L. V., Sokolova L. V.**Features of visual processing in children with atypical development.**

St. Petersburg State University,St. Petersburg

4. DagaevNikolay, Ossadtchi Alexei. **Local linearity approach for extracting physiologically plausible interpretations of non-linear decision rules in EEG classification.** Higher School of Economics, Moscow
5. Gundelakh F., NagornovaZh., Sonkin K., Chevykalova A., Khomenko Y., Stankevich L., Shemyakina N.**Application of scalable heterogeneous classifier of EEG patterns of fine motor imaginary decoding for Brain-computer interfaces (BCI).** SPbSTU, IEPHB RAS, IHB RAS, , St. Petersburg
6. Koshkin Roman, Ossadtchi Alex, Shtyrov Yuri. **Working memory load in simultaneous language interpretation: an erp study.** HigherSchoolofEconomics, Moscow
7. Kuznetsova Aleksandra, Koshkin Roman, Ossadtchi Alexei. **Localizing hidden regularities with known temporal structure in the EEG evoked response data.** Higher School of Economics, Moscow
8. LamminpiyaAino. **Dependence of the characteristics of eye movements on the spatial-frequency properties of the stimulus.** PavlovInstituteofPhysiology, RussianAcademyofSciences, St. Petersburg
9. Lomtatidze O.V., Alekseeva A.S. **Some aspects of emotional response during social advertising's perception by higher-educated students.** Ural Federal University, Yekaterinburg
10. MarshevVasili, ChetverikovAndrey, Kuvaldina Maria. **Visual statistics in spatially organized sets.** DepartmentofPsychology, St. Petersburg State University,St. Petersburg
11. MinkovVasiliy, SmetaninNikolay, MarkinaNastya, DybushkinIgnat, Ossadtchi Alexei. **Neurophysiological correlates of efficient learning in the neurofeedback paradigm.** Higher School of Economics, Moscow
12. Nikitin N.I., AgaevaM.Yu.**Auditory masking of moving sound.** Pavlov Institute of Physiology, Russian Academy of Sciences, St. Petersburg
13. Petropavlovskaia E.A., Shestopalova L.B., Semenova V.V., Nikitin N.I.**Effects of attention and sound motion on the event-related rhythmic activity.**Pavlov Institute of Physiology, Russian Academy of Sciences, St. Petersburg
14. Reshetnikova V.V. (1), Bobrova E.V. (2), Frolov A.A. (3, 4, 5). **The role of psycho-emotional status in the control of BCI systems.** 1 - Saint-Petersburg State University (St. Petersburg, Russia); 2 - Pavlov Institute of Physiology (St. Petersburg, Russia); 3 - Institute of Higher Nervous Activity of Russian Academy of Sciences (Moscow, Russia); 4 - Institute of Translational Medicine of Pirogov of Russian National Research Medical University (Moscow, Russia); 5 - Technical University of Ostrava (Ostrava Poruba, Czech Republic)
15. Semenova V.V., Shestopalova L.B., Petropavlovskaia E.A., Nikitin N.I.**Detection of rising and falling intensity sounds: mismatch negativity and perceptual measures.** Pavlov Institute of Physiology, Russian Academy of Sciences, St. Petersburg
16. Shelepin E., Nemiroskaya K., Zashchirinskaia O.**Understanding of texts with various level of visual complexity among school students with learning difficulties.** Pavlov Institute of Physiology, Russian Academy of Sciences, St. Petersburg State University, St. Petersburg
17. Shelepin K.[1], Sokolov A.[2,], Zhukova O.[3], Vasilyev P.[3], Fokin V.[2]Trufanov G.[2]Pronin S.[3], **Neurophysiology of insight.**,1 – "Neuroiconic-Neuromechanic" Lt.,2- Federal North-West Medical Research Centre. 3-Pavlov Institute of Physiology, Russian Academy of Sciences. St. Petersburg
18. Smetanin Nikolai, MinkovVasiliy, MarkinaNastya and Ossadtchi Alexei**. Software for flexible EEG and MEG neurofeedback experiments design, real-time processing and data analysis.** Higher School of Economics, Moscow
19. Yakimova Elena, ShelepinEvgeny, Pronin Sergey, Muravyova Svetlana, Shelepin Yuri. **Innovative developments in the field of rehabilitation of patients with schizophrenia.**PavlovInstituteofPhysiology, RussianAcademyofSciences, St. Petersburg

Thursday, June 29, 2017

IEEE International Symposium «Video and audio signal processing in the context of Neurotechnologies», SPCN-2017

Location: Makarovaemb. 6, Conference hall

10.30-11.00	**Registration for Symposium participants**
11.00-11.20	Talk session 4 **Cognitive Science and Neurotechnologies** Moderators: ZashchirinskaiaOksana, Ogorodnikova Elena
11.00-11.20	**Quantativeanalysys of cognitive and emotional processing in schizophrenia active brain** Murav'eva S.V., Moiseenko G.A., ShelepinYu.E., Pavlov Institute of Physiology, Russian Academy of Sciences, St. Petersburg
11.20-11.40	**Auditory training as a rehabilitation method for patients with hearing and speech impairments** Ogorodnikova[1] E.A., Baliakova[1] A.A., Zhilinskaia[2] E.V., Pak[1] S.P., Boboshko[2]M.Yu. [1]Pavlov Institute of Physiology, Russian Academy of Sciences, [2]Academician I.P.Pavlov First St. Petersburg State Medical University, St. Petersburg
11.40-12.00	**Peculiarities of perception by first-graders of texts with different formats of visualization** Koroleva E., St. Petersburg State University, St. Petersburg
12.00-12.20	**Psychophysiological basis of nonverbal communication** Zashchirinskaia O.V., Nikolaeva E.I., St. Petersburg State University, Herzen State Pedagogical University. St. Petersburg
12.20-12.40	**Decision making about facial expressions in the threshold observation conditions** Zhukova O.V., Shelepin Y.E., Vasiljev P.P., Pavlov Institute of Physiology, Russian Academy of Sciences, St. Petersburg
12.40-13.00	**Investigation of cognitive abilities of rhesus monkeys** Ivanova L., Podvigina D., Varovin I., HarauzovA..Pavlov Institute of Physiology, Russian Academy of Sciences, St. Petersburg
13.00-14.00	**Coffee break, Lunch time**
14.00-14.20	**Improvingeffectivenessof target recognition by human-computer convergence** Malyshev I. A.,PonomarevS.V.Vavilov State Optical Institute, St. Petersburg
14.20-14.40	**Comparison of objectsbrightnessthreshold fornaked eye adapted to the dark and the**

eye, equipped EMCCD camera.
Tibilov A.S., Vavilov State Optical Institute, St. Petersburg

14.40-15.00 **Metamaterials for magnetic resonance imaging**
Zubkov M., ITMO University, Laboratory of Applied Radioengineering, St. Petersburg

15.00-15.20 **Combining utterance-level and frame-level feature representations for emotion classification from speech**
Verkholyak Oksana, KarpovAlexey, ITMO University, St. Petersburg

15.20-15.40 **To the question of constructing color palettes with predefined properties in an isotropic color space**
Sauta O.I., Rumyantsev P.A., Kaziev I.A., Kurylev M.B., Kryukovsky E.S., FazleyevA.Yu.VNIIRA-Navigator Company, St. Petersburg

15.40-16.00 **Interaction of magno and parvocellular visual systems functioning as marker of brain functional state in extreme conditions**
Shoshina I.1, ZavjalovaE2., Shelepin Yu1., 1Pavlov Institute of Physiology, Russian Academy of Sciences, St. Petersburg, 2Siberian Federal University, Krasnojarsk

Wednesday, June 28, 2017

Семинар «Актуальныетехнологии: IPвТВ 2017»

Location: PravdaStreet, 13

9.30-10.00 Регистрация. Приветственный кофе

10.00-10.30 «Применение IP-технологий при построении современного телецентра». Докладчик: Алексей Пискунов, ведущий инженер Корпорации DNK.

10.30-11.00 «Аппаратные платформы для ТВ-технологий будущего». Докладчик: ИгорьПодуков, Hewlett Packard Enterprise.

11.00-11.30 «ConnectedLive. ДемонстрациявидеомикшераDYVI». Докладчик: Лорен Пети (LaurentPetit), вице-президент по производству EVS (Бельгия).

11.30-12.00 «Технология NDI. Новые производственные микшеры IPSeries и TriCasterTC1». Докладчик: ЗолтанМатула (ZoltanMatula), компания Newtek (США).

12.00-12.30 «SDImustDIE». Докладчик: Татьяна Золотуская, менеджер по продажам в компании CinegyGmbH (Германия).

12.30-12.50 Кофе-брейк

12.50-13.20 «IP-решения ImagineCommunications для современных вещательных комплексов». Докладчик: Константин Ванаг, региональный менеджер по продажам ImagineCommunications.

13.20-13.50 «Телевещание: переход на IP и облачные решения». Докладчик: Вячеслав Садилов, ведущий специалист компании Harmonic.

13.50-14.20 «Проект ВСЕ. Телецентр на основе IP». Докладчик: Сергей Архипцев, технический инженер по продажам, SnellAdvancedMedia.

14.20-14.50 «Panasonic. Обзор применения IP на практике». Докладчик: Алексей Егоров, инженер отдела вещательного оборудования Panasonic.

14.50-15.20 «PTP синхронизация. Демонстрация IP/SDI-платформы Prism». Докладчик: Андрей Ресенчук, консультант по применению, компания Tektronix.

15.20-15.40 Кофе-брейк

15.40-16.10 «Новинки оборудования LiveU». Докладчик: Анастасия Хорт, директор по продажам LiveU в РФ и странах Балтии.

16.10-16.40 «Sony: системы и оборудование IPLive». Докладчик: Сергей Бобнев, менеджер по маркетингу компании Sony.

16.40-17.10 «Решения Huawei для IP-сетей телекомпаний». Докладчик: Владимир Горенышев, компания Huawei.

17.10-17.40 «Успешные IP-проекты GrassValley в вещательных центрах». Докладчик: Александр Богаткин, Генеральный директор GrassValleyRussia&CIS.

17.40-18.10 «Измерительное оборудование Guramex». Докладчик: ГурамШахдинаров, руководитель компании Guramex.

18.10 Фуршет

June 29-30

XV Международная научно-техническая конференция и конкурс студентов и аспирантов «Цифровые и информационные технологии в электронной медиаиндустрии-2017»

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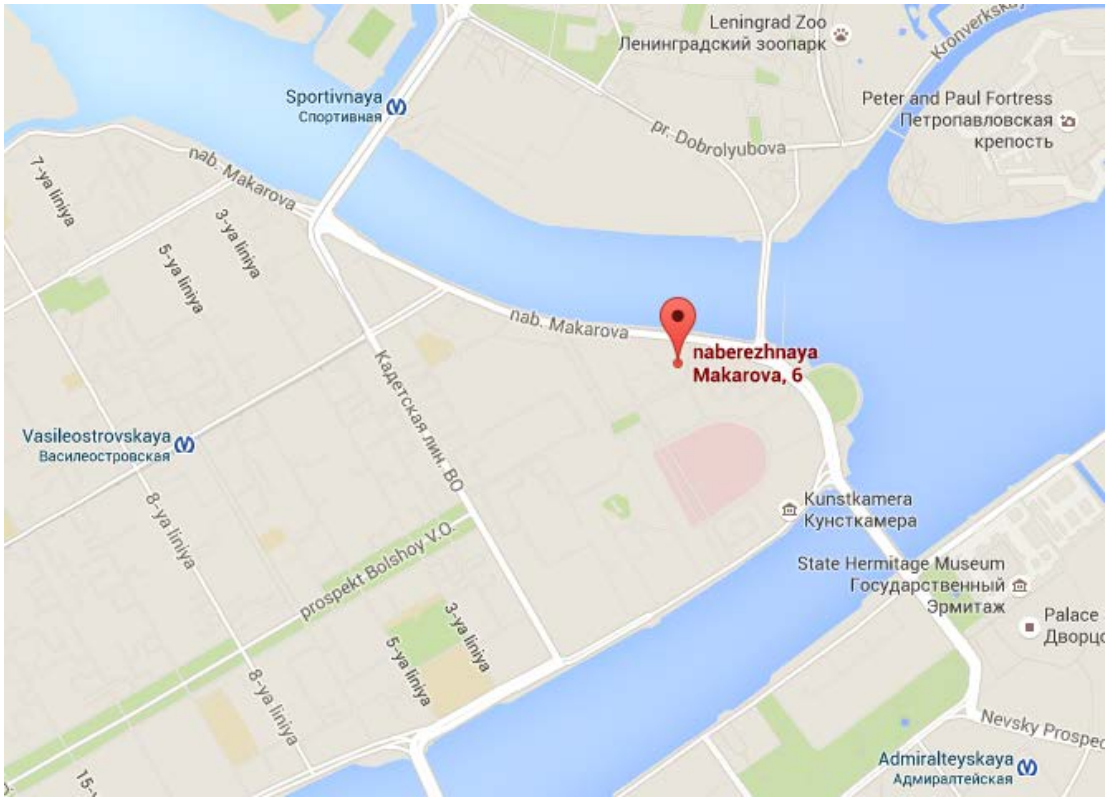
Website: https://spcn.co/

Maps

Closest metro stations to main SPCN 2016 locations: **Admiralteyskaya**, **Vasileostrovskaya, Sportivnaya** (there is 300 metertravolator in the tunnel under Neva River, between Sportivnaya metro station and Makarova embankment).



Location: Pravda Street, 13, metro station Zvenigorodskaya