



Program of

17th Conference of Open Innovations Association FRUCT

20-24 April 2015





EMC²



GAUDEAMUS IGITUR,
JUVENES DUM SUMUS!
POST JUCUNDAM JUVENTUTEM,
POST MOLESTAM SENECTUTEM
NOS HABEBIT HUMUS.

UBI SUNT, QUI ANTE NOS
IN MUNDO FUERE?
VADITE AD SUPEROS,
TRANSITE AD INFEROS,
UBI JAM FUERE.

VITA NOSTRA BREVIS EST,
BREVI FINIETUR,
VENIT MORS VELOCITER,
RAPIT NOS ATROCITER,
NEMINI PARCETUR.

VIVAT ACADEMIA,
VIVANT PROFESSORES!
VIVAT MEMBRUM QUODLIBET,
VIVANT MEMBRA QUAE LIBET!
SEMPER SINT IN FLORE!

VIVANT OMNES VIRGINES
FACILES, FORMOSAE!
VIVANT ET MULIERES,
TENERAE, AMABILES,
BONAE, LABORIOSAE!

VIVAT ET RESPUBLICA,
ET QUI ILLAM REGIT!
VIVAT NOSTRA CIVITAS,
MAECENATUM CARITAS,
QUAE NOS HIC PROTEGIT

PEREAT TRISTITIA,
PEREANT DOLORES,
PEREAT DIABOLUS,
QUIVIS ANTIBURSCHIUS,
ATQUE IRRISORES!



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Timofey Turenko (MariaDB Corporation Ab, Finland)
Yu Weider (San Jose State University, USA)
Liang Zhou (Technical University of Munich, Germany)



The program of the 17th FRUCT conference

April 20-24, 2015, Yaroslavl, Russia

All participants must be registered at www.fruct.org/conference17

Yaroslavl State University, Sovetskaya st. 14, 150000 Yaroslavl

DATE	TIME	PROGRAM	
20.04.15	10:00-18:30	1st day of Capabilities of Intel Galileo & Edison: first encounter training, Room 304 (in Russian)	
21.04.15	10:00-18:00	2nd day of Capabilities of Intel Galileo & Edison: first encounter training, Room 304 (in Russian)	
22.04.15	09:00-09:30	Conference and Workshop Registration, Main Conference Hall (2nd floor)	
	09:30-12:30	Workshop on Cyber-Physical-Social Systems, Room 304 (3rd floor)	LBS and e-Tourism WG meeting, Main Conference Hall (2 nd floor)
	12:00-13:00	17th FRUCT Conference Registration, Main Conference Hall (2nd floor)	
	13:00-14:30	Opening of the 17th FRUCT conference, Main Conference Hall (2nd floor) Keynote talk: M-health projects and mining of Big Data, by Prof. Oleg Medvedev	
	14:30-14:45	Coffee break	
	14:45-16:15	e-Tourism and Location Based Services, Main Conference Hall (2nd floor)	
	16:15-16:30	Coffee break	
	16:30-18:00	Solutions for advanced use cases I, Main Conference Hall (2nd floor)	
	18:00-19:30	Social Event: Walking excursion in the historical center of Yaroslavl	
23.04.15	09:00-09:30	17th FRUCT Conference Registration, Main Conference Hall (2nd floor)	
	09:30-11:30	Solutions for advanced use cases II, Main Conference Hall (2nd floor)	Smart Spaces and IoT WG meeting, Room 304
	11:30-11:45	Coffee break	
	11:45-12:45	e-Health and Wellbeing, Main Conference Hall (2nd floor)	
	12:45-13:45	Lunch break (Lunch on your own)	
	13:45-14:45	Robotic systems, Main Conference Hall (2nd floor)	
	14:45-15:00	Coffee break	
	15:00-17:00	Smart Spaces and Internet of Things, Main Conference Hall (2nd floor)	
	17:00-17:15	Coffee break	
	17:15-18:15	Invited talk Storage Evolution in IT: Innovations from EMC Corporation, by Artur Vartanyan, EMC Corporation, Main Conference Hall (2nd floor)	
	18:15-18:30	Coffee break	
	18:30-19:30	Demo Pitches and setup of Demo Session: Presentations in Pecha Kucha format, Main Conference Hall (2nd floor)	
19:30-21:00	Demo Session and Social Event, Main Conference Hall (2nd floor)		
24.04.15	09:00-09:30	17th FRUCT Conference Registration, Main Conference Hall (2nd floor)	
	09:30-11:15	Network Technologies, Main Conference Hall (2nd floor)	mHealth WG meeting, Room 304
	11:15-11:30	Coffee break	
	11:30-13:00	Embedded Systems and Networks I, Main Conference Hall (2nd floor)	mHealth WG meeting (cont.), Room 304
	13:00-14:00	Lunch break (Lunch on your own)	
	14:00-15:30	Embedded Systems and Networks II, Room 304	
	15:30-15:45	Coffee break	
	15:45-17:00	Image processing and machine vision, Room 304	
	17:00-17:15	Official closing of the 17th FRUCT conference, Room 304	



Practical Information

The 17th FRUCT conference will be held in the main building of the Yaroslavl State University. The building is located in the centre of Yaroslavl city at the Krasnaya Ploshad (Red Square). The address is: Yaroslavl, Sovetskaya street 14. You can get there from any site of the city using a public transportation that goes to the “Krasnaya Ploshad” stop.

Transportation: Yaroslavl has a vast public transportation system with a mild price of 18 roubles for a single ride. You can buy tickets only by cash from conductors inside a vehicle. Route schemes of public transport are available on web page <http://yargortrans.ru/schemes.php> (in Russian). The current location of municipal transport can be viewed using service <http://www.ot76.ru/> (in Russian).

Navigation: In order to plan a route inside the city you can use RusAvtobus (<http://yar.rusavtobus.ru/en/>), Yandex Maps (<https://maps.yandex.ru/>) or 2GIS (<http://2gis.ru/yaroslavl>) services. The last listed service also allows making explicit search for a place to have a meal, buy food and souvenirs.

Sightseeing: Yaroslavl is an old city (founded in 1010) that has a lot of historic monuments. It is the key town of the historical Golden Ring of Russia. We encourage you to take an opportunity and see old churches, visit the embankment and take picture of yourselves inside the pavilion. The location and brief description of sites can be found in the following web pages: <https://autotravel.ru/town.php/20>, <http://www.yarcom.ru/sights/yaroslavl> and <http://www.yar.ru/> (all in Russian).

All conference participants are welcome to take part in the walking guide tour in the historical part of Yaroslavl downtown that will be held after end of main session on April 22 (Wednesday) starting at 18.00, we meeting in the front of the conference main room.

The screenshots show the app's main screen with a search bar, a weather widget (5°C, 7m/s, 754mm Hg, 61%), and a list of nearby attractions. A callout box points to the search bar: "List of images related to the location". Another points to the map: "Clickable map". A third points to the weather: "User destination point (FRUCT 17th conference)". A fourth points to the attraction list: "Current weather". A fifth points to the first three items: "First three interesting places around". A sixth points to the list: "Interested places around". A seventh points to an item: "Scrollable list of images for interesting place". An eighth points to an item: "Interesting place description". A ninth points to an item: "Distance from the location to an attraction". A tenth points to an item: "Attraction image".

We recommend you to use Tourist Assistant - TAIS - a mobile tourist guide for Android devices. Based on your current location, it provides recommendations about places of interest around. You can see your location in the map, browse information about attraction around, check photos, current weather and create path to place of interest. The information is aggregated from Wikipedia, Wikivoyage, Wikitravel, Panoramio. During FRUCT conference TAIS will allow participants to easily find way to the locations of the main conference. In the main screen please select one of main attractions “FRUCT 17th Conference”. When the user selects one of the attractions he/she can open map and see path from current location to the FRUCT 17th conference place.





SmartRoom Demo: Client Installation Notes

We welcome you to take part in the life-demo of the SmartRoom system that will be used at Section "Smart Spaces and Internet of Things" (on April 23). The system is developed by Petrozavodsk State University in cooperation with other FRUCT members.

Each presenter shall register account in SmartRoom and upload presentation to the system in PDF before beginning of the section. Then the presenter can log in the system using the SmartRoom client (Android or Windows Phone). The following steps describe the above procedure.

1. Connect to "SmartRoom" network via Wi-Fi (deployed temporarily in the conference room).
2. Register your account at the web service <http://smartroom-fruct> (note: this address is accessible only when you are physically located in the "SmartRoom" environment, i.e., it will work during the conference section).
3. Log in and upload your presentation in PDF (updates can be made later).
4. Install the SmartRoom client on your mobile phone, see QR codes below.
5. Run your client and log in the SmartRoom system using the credentials from Step 2.

All session attendees (not presenters) are also welcome to use either anonymous login or register own account. Please use the below provided QR codes or short URLs for downloading the SmartRoom client:

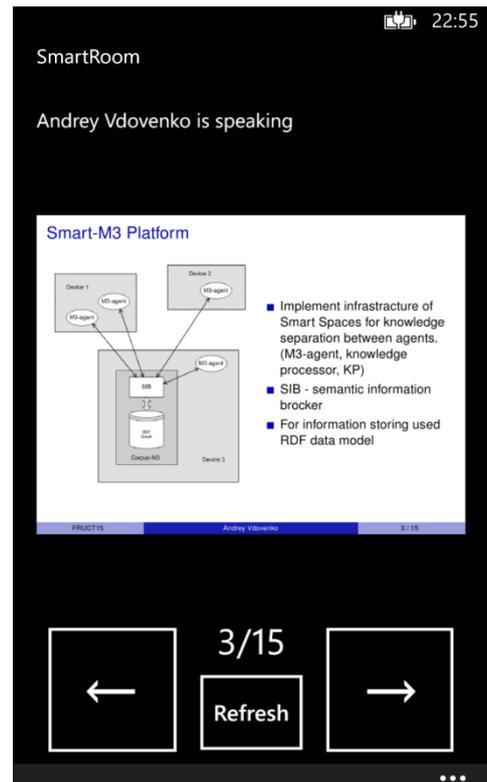
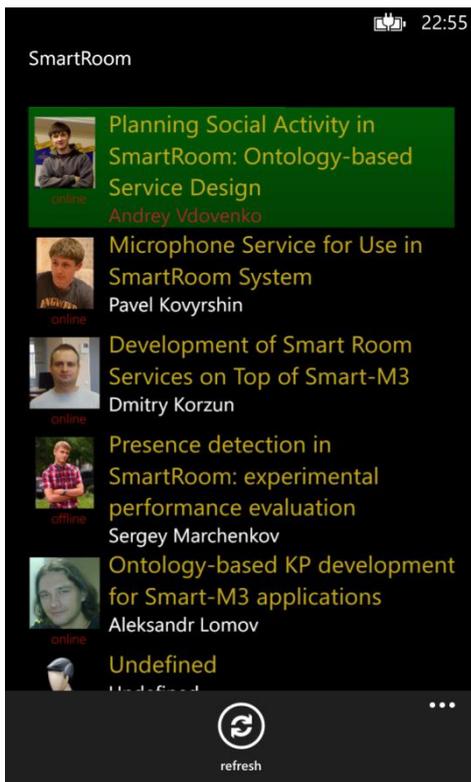


Android - bit.do/sr_android



Windows Phone - bit.do/sr_wp

The respective SmartRoom client manual can be accessed using the following QR codes:





Capabilities of Intel Galileo & Edison: first encounter training (RU)

Training dates: April 20-21, 2015

Place: Yaroslavl State University, Sovetskaya st. 14, Room 304

Overview

Please note that this training will be given in Russian language. The training is free of charge, but in order to take part in it you shall register at page <http://fruct.org/galileo>.

«Возможности Intel® Galileo & Edison: первое знакомство» — двухдневный бесплатный тренинг, проводимый сотрудниками лаборатории ФОТ БС радиофизического факультета ННГУ им. Н.И. Лобачевского, в рамках 17ой FRUCT конференции. Тренинг будет проводиться 20-21 апреля 2015 года. Рабочий язык - русский.

На тренинге будут представлены технические особенности и возможности, варианты использования и тестирования одноплатных компьютеров корпорации Intel: Intel®Galileo, Intel® GalileoGen 2, Intel® Edison. В ходе тренинга будет предложено решение практических задач в мини-группах. С помощью этой платформы участники своими руками смогут собрать такие устройства как: интересные интерактивные гаджеты, домашних роботов, элементы умного дома, а так же создать системы дистанционного управления через интернет. На тренинге будет предоставлен доступ к следующему оборудованию: Intel®Galileo, Intel® GalileoGen 2, Intel® Edison, Intel IoT Dev Kit и другие наборы датчиков и сенсоров, а так же хорошая компания и конструктивное общение!

Galileo, Galileo Gen2 и Edison — продукты, совместимые с платформой Arduino, основное назначение которых – создание решений в сфере интернета вещей (IoT).

Intel® Galileo — это Arduino-совместимая плата от Intel, основанная на x86-системе на чипе (SoC) Intel Quark X1000 с тактовой частотой 400 МГц. Это 32-битный процессор класса Intel Pentium, и по производительности ему ещё не было равных среди любых Arduino-совместимых плат. Эта плата полностью совместима с Arduino-шилдами и программируется из привычной Arduino IDE.

Intel Edison — это новый миниатюрный компьютер от Intel, разработанный для использования в носимых технологиях. В модуле размером с SD-карту разместился двухъядерный процессор Intel Atom Silvermont с тактовой частотой 500 МГц, 1 ГБ оперативной памяти, 4 ГБ eMMC флеш-памяти и микроконтроллер Quark с частотой 100 МГц. Также имеется поддержка Bluetooth 4.0 LE и двухдиапазонного Wi-Fi 802.11n.

Более подробная информация и программа тренинга опубликованы на странице <http://fruct.org/galileo>.

Требования к участникам

Участникам тренинга рекомендуется иметь с собой ноутбук с предустановленной операционной системой Windows не ниже версии 7.0. Участники должны знать основы программирования (опыт программирования на любом языке) и электротехники школьного уровня (например, что такое конденсатор и закон Ома). Если опыта в программировании нет - советуем Вам прочитать любой учебник по основам программирования на таких языках как C++, Java, PHP, JavaScript или других. Уверенное владение ПК обязательно.

Программа

Апрель 20 (Понедельник)

Ярославский государственный университет, Советская 14, 150000 Ярославль

Тренинг: Возможности Intel® Galileo & Edison: первое знакомство			Ведущая: Диана Ильина
Аудитория: Аудитория 304			
10:00	30m	Регистрация	
10:30	30m	Теоретическая часть: знакомство с платами Intel® Galileo и Intel® Edison	
11:00	2h	Настройка среды разработки решение базовых практических задач	
13:00	1h	Обеденный перерыв (участники обедают самостоятельно)	
14:00	1h	Обзор модульных задач (учебных проектов) использования плат Intel® Galileo и Intel® Edison формирование команд	
15:00	1h	Превращаем Intel® Galileo и Intel® Edison в полноценный Linux-компьютер	



16:00	2h	Начало работы над проектом
18:00	30m	Сессия вопросов. Окончание первого дня тренинга

Апрель 21 (Вторник)

Ярославский государственный университет, Советская 14, 150000 Ярославль

Тренинг: Возможности Intel® Galileo & Edison: первое знакомство

Аудитория: Аудитория 304

Ведущая: Диана Ильина

10:00	3h	Продолжение работы над проектом: подключение датчиков и сенсоров
13:00	1h	Обеденный перерыв (участники обедают самостоятельно)
14:00	3h	Завершение работы над проектами: окончательная сборка макета
17:00	1h	Демонстрация проектов. Закрытие тренинга



Workshop on Cyber-Physical-Social Systems

Workshop dates: April 22-23, 2015

Workshop chair: Alexey Kashevnik

Place: Yaroslavl State University, Sovetskaya st. 14,
in Room 304 (3rd floor)

Overview

Cyber-physical systems will transform how we interact with the physical world just like the Internet transformed how we interact with one another. Cyber-Physical-Social systems tightly integrate physical, cyber, and social worlds based on interactions between these worlds in real time. This area is a new research and development field that needs to develop models, methodologies, and theories for efficient interaction between physical, cyber, and social worlds. Cyber-Physical-Social systems rely on communication, computation and control infrastructures commonly consisting of several levels for the three worlds with various resources as sensors, actuators, computational resources, services, humans, etc. Operation and configuration of CPS require approaches for managing the variability at design time and the dynamics at runtime caused by a multitude of component types and changing application environments.

The seminar program consists of presentations given by academic experts and training on Cyber-Physical-Social systems development with Lego Mindstorms EV3 kits. The seminar program is concluded by demo section organized in cooperation with the 17th FRUCT conference.

We warmly welcome industry and academic experts to contribute to the seminar by participation in interactive discussions and experience sharing. The seminar is free of charge and open for participation. The seminar will be held in co-location with the 17th FRUCT conference, so the seminar participants are welcome to take part in all events of the 17th FRUCT conference. The workshop is organized by international laboratory «Intelligent Technologies for Socio-Cyberphysical Systems», ITMO University, in cooperation with other FRUCT members.

For more information and latest updates of the seminar program, please, visit the seminar web page www.fruct.org/spss.

Topics (non-exclusive)

- ✓ Ontology-based cyber-physical systems
- ✓ Security in cyber-physical systems
- ✓ Social systems development
- ✓ Context modeling in cyber-physical systems
- ✓ Cyber-physical systems and Internet of Things
- ✓ Smart spaces for cyber-physical systems
- ✓ Knowledge management in cyber-physical systems

Training: Cyber-Physical-Social systems development with Lego Mindstorms EV3 kits

Lego® Mindstorms is one of the most popular sets in robot constructing education. The latest system, called the Lego Mindstorms EV3, was released on September 1, 2013. Lego Mindstorms has own IDE for robot actions programming. It allows to program actions by visual programming language using blocks with customizing parameters. These blocks cover in general all robot functionality. In the training an environment for high-level program development is considered. You will learn how to create and program robots with Lego Mindstorms EV3 robotic kit running Lego Java OS (LeJOS). The following topics will be covered by the training:

- The core set of EV3 robotic kit and its' benefits to the other robotic kits.
- Alternatives to the embedded OS. Installing and running LeJOS.
- Robot programming with LeJOS. Classes for the robot control.
- EV3 robot as knowledge processor in Smart-M3 Environment.

Pre-requirements

You should have basic experience of programming on Java plus elementary knowledge of Linux. Please have laptop for exercises. The recommended programming environment includes:

- Java SE v7u60;



- Your preferred IDE. LeJOS has Eclipse plugin for developing and debugging, but environment can be configured in other IDE's;
- LeJOS classes;
- PuTTY or other SSH client for communication with the robot.

Eclipse plugin and *.jar classes with documentation can be found on the project repository at SourceForge. We recommend downloading the 0.8.1-beta version of LeJOS as the latest tested version.

Program

April 22 (Wednesday)

Yaroslavl State University, Sovetskaya st. 14, 150000 Yaroslavl

Session: Cyber-Physical-Social Systems		Chairman: Alexey Kashevnik
Room: 304		
09:00	30m	Registration to the Cyber-Physical-Social Systems Workshop and 17th FRUCT Conference
09:30	30m	Keynote talk: Cyber-Physical-Social systems, Alexey Kashevnik, SPIIRAS, Russia
10:00	15m	Coffee break
10:15	2h	Training: Cyber-Physical-Social systems development with Lego Mindstorms EV3 kits, by Nikolay Teslya, SPIIRAS, Russia
12:15	15m	Questions & Answers

April 23 (Thursday)

Yaroslavl State University, Sovetskaya st. 14, 150000 Yaroslavl

Session: Smart Spaces and Internet of Things		Chairman: Alexey Kashevnik
Room: Main Conference Hall (2 nd floor)		
15:00	15m	Smart-M3-Based Robots Self-Organization in Pick-and-Place System, Alexander Smirnov, Alexey Kashevnik, Nikolay Teslya, SPIIRAS, Sergey Mikhailov, ITMO, Anton Shabaev, PetrSU, Russia
15:15	15m	A Conceptual Framework for Development of Context-aware Location-based Services on Smart-M3 platform, Ilya Paramonov, Andrey Vasilyev and Eldar Mamedov, YarSU, Russia
15:30	15m	Verification-Enabling Interaction Model for Services in Smart Space: a TAIS case, Andrew Ponomarev, SPIIRAS, Russia
15:45	15m	Design of Semantic Information Broker for Localized Computing Environments in the Internet of Things, Ivan Galov, Aleksandr Lomov and Dmitry Korzun, PetrSU, Russia
16:00	15m	Industrial Cyber-Physical System for Lenses Assembly: Configuration Workstation Scenario, Alexey Kashevnik and Nikolay Teslya, SPIIRAS, Boris Padun, Kirill Kipriyanov and Valery Archhipov, ITMO, Russia
16:15	15m	Proposed approach for organizational structure of sensor networks, Aleksandr Gorbachev, Eugene Ermakov and Sergey Panasura, Tyumen University, Russia
16:30	15m	Feasibility Study of the THz Band for Communications between Wearable Electronics, Vitaly Petrov, TUT, Finland
16:45	15m	On Mobile Bluetooth Tags, Dmitry Namiot, MSU, Russia, Manfred Sneps-Sneppe, Ventspils University College, Latvia
17:00	2.5h	Break
Session: Conference social event combined with Demo session		Chairman: Ilya Paramonov
Room: Main Conference Hall (2 nd floor)		
19:30	1.5h	Demo Session and Social Event
21:00		Closing of Workshop on Cyber-Physical-Social Systems



ITMO UNIVERSITY



SPIIRAS



The program of the 17th FRUCT conference

April 20-24, 2015, Yaroslavl, Russia

Please note that all participants must register before the conference at www.fruct.org/conference17

April 22 (Wednesday)

Yaroslavl State University, Sovetskaya st. 14, 150000 Yaroslavl

Session: Official opening of the 17 th FRUCT conference		
Room: Main Conference Hall (2 nd floor)		Chairman: Sergey Balandin
12:00	1h	17th FRUCT Conference Registration
13:00	45m	Official opening of the 17 th FRUCT conference Welcome words: Alexander Rusakov – Rector of Yaroslavl State University Sergey Balandin – President of FRUCT Association
13:45	45m	Keynote talk: M-health projects and mining of Big Data by Oleg Medvedev, Moscow State University, Russia
14:30	15m	Coffee break
Seminar: e-Tourism and Location Based Services		
Room: Main Conference Hall (2 nd floor)		Chair: Ilya Paramonov
14:45	15m	Implementation of the recommendation system for the “Open Karelia” information system, Mark Zaslavskiy, ITMO, Tatyana Berlenko and Kirill Krinkin, LETI, Russia
15:00	15m	The Route Planning Services Approaches for people with disability, Kirill Kulakov and Irina Shabalina, PetrSU, Russia
15:15	15m	Ontological Model and its Applying for Multisource Information Storage in Cultural Trip Planning Service, Kirill Kulakov and Oksana Petrina, PetrSU, Russia
15:30	15m	Enhancing the SmartRoom System with e-Tourism Services, Andrey Vdovenko, Sergey Marchenkov and Dmitry Korzun, PetrSU, Russia
15:45	15m	Indoor Localization Methods Based on Wi-Fi Lateration and Signal Strength Data Collection, Maksim Shchekotov, SPIIRAS, Russia
16:00	15m	Smartphone-Based On-the-Fly Two-Wheeled Self-Balancing Vehicles Rider Assistant, Alexander Smirnov, Alexey Kashevnik, SPIIRAS, Igor Lashkov, ITMO, Russia, Naohisa Hashimoto and Ali Boyali, NIASTISRI, Japan
16:15	15m	Coffee break
Seminar: Solutions for advanced use cases I		
Room: Main Conference Hall (2 nd floor)		Chair: Kirill Krinkin
16:30	15m	MariaDB MaxScale: an intelligent database proxy, Timofey Turenko, MariaDB Corporation Ab, Finland
16:45	15m	A systematic literature review on engineering technology and management challenge of micro wind turbine, Anjar Priandoyo, University of York, UK
17:00	15m	Software Architecture for Scalable Computing Systems with Automatic Granularity Selection of Executable Code, Mikhail Pavlov, NPP Satek Plus Ltd, Alexander Petrov, Rybinsk Aviation Technical University, Russia
17:15	15m	Modeling of quantum Grover's algorithm on a classical computer, Daniil Shalak, Digital Design, Russia
17:30	15m	Development Program Help in the Study of Reed-Solomon Codes, Vitaly Ushakov, SUAI, Russia
17:45	15m	Functional model of a software system with random time horizon, Dmitrii Zubok, Aleksandr Maiatin, Maksim Hegai and Valentina Kiryushkina, ITMO, Russia
18:00	1.5h	Social Event: Walking excursion in the historical center of Yaroslavl
19:30		Closing of Day 3



April 23 (Thursday)

Yaroslavl State University, Sovetskaya st. 14, 150000 Yaroslavl

09:00	30m	17th FRUCT Conference Registration	
Session: Solutions for advanced use cases II			
Room: Main Conference Hall (2 nd floor)		Chairman: Timofey Turenko	
09:30	15m	MariaDB Enterprise, Ilya Storozhilov, MariaDB Corporation, Russia	
09:45	15m	State-of-the-Art Analysis of Available Advanced Driver Assistance Systems, Alexander Smirnov, SPIIRAS, Igor Lashkov, ITMO, Russia	
10:00	15m	Automation of Thesaurus Construction Using Clusterization-Based Dictionary Analysis, Nadezhda Lagutina and Ilya Paramonov, YarSU, Inna Vorontsova, Yaroslavl Pedagogical University, Natalia Kasatkina, YarSU, Russia	
10:15	15m	Density of Multi-Task Real-Time Applications, Sergey Baranov, SPIIRAS, Victor Nikiforov, ITMO, Russia	
10:30	15m	Solving the Vehicle Routing Problem during the Development of ATM Cash Service Planning System, Ekaterina Kaurova, ITMO, Ivan Kaurov, Delovye konsultatsii LLC, Arthur Lazdin, ITMO, Russia	
10:45	15m	Tap2smart: a New Authentication Method for Modern Smartphones, Maxim Grankin, Maria Shelest, Evgeny Bakin and Grigory Evseev, SUAI, Russia	
11:00	15m	PEG-based language workbench, Ivan Loginov, Yuriy Korenkov and Arthur Lazdin, ITMO, Russia	
11:15	15m	Approach to the effective use of limited computing resources in educational institutions for providing multimedia services, Denis Parfenov, Irina Bolodurina and Alexander Shukhman, Orenburg University, Russia	
11:30	15m	Coffee break	
Seminar: e-Healthcare and Wellbeing			
Room: Main Conference Hall (2 nd floor)		Chair: Oleg Medvedev	
11:45	15m	Architectural Approach to the Multisource Health Monitoring Application Design, Yuliya Zavyalova, Aleksandr Borodin, Alexei Zaharov and Igor Yamushev, PetrSU, Russia	
12:00	15m	Architecture of Automatic Training Data Gathering System - Training Assistant, Nikita Timofeev, Andrey Vasilyev, Ivan Timofeev and Sergey Lobarev, YarSU, Russia	
12:15	15m	Mobile Apps for Stimulating Healthy Life: Walky Doggy Reference Example, Denis Laure, Aalto University, Finland, Oleg Medvedev, MSU, Russia, Sergey Balandin, ITMO/FRUCT, Russia/Finland, Ksenia Lagutina, YarSU, Russia	
12:30	15m	On the Use of Splines for Wavelet Construction for Solving the Problem of Biomedical Signal Analysis Process Automation, Andrey Stepanov, SUT, Russia	
12:45	1h	Lunch break (on your own)	
Session: Robotic systems			
Room: Main Conference Hall (2 nd floor)		Chairman: Dmitry Korzun	
13:45	15m	Self-localization of Mobile Robot in Unknown Environment, Alexandr Prozorov, Alexander Tyukin, Andrew Priorov and Ilya Lebedev, YarSU, Russia	
14:00	15m	Cloud-Centric PaaS Framework for Robots Operation, Alexey Lukashin, Vladimir Zaborovsky and Vladimir Muliukha, SPb Politechnic, Russia	
14:15	15m	The Artificial Landmark Design for Mobile Robots Localization, Kirill Krinkin, OSLL, Dmitriy Kartashov and Artur Huletski, St. Petersburg Academic University, Russia	
14:30	15m	The Estimation of Secure Condition of Multi-Agent Robotic System in Case of Information Influence on the Single Component, Igor Zikratov, IlJa Lebedev and Victoria Korzhuk, ITMO, Russia	
14:45	15m	Coffee break	
Session: Smart Spaces and Internet of Things			
Room: Main Conference Hall (2 nd floor)		Chairman: Alexey Kashevnik	
15:00	15m	Smart-M3-Based Robots Self-Organization in Pick-and-Place System, Alexander Smirnov, Alexey Kashevnik, Nikolay Teslya, SPIIRAS, Sergey Mikhailov, ITMO, Anton Shabaev, PetrSU, Russia	
15:15	15m	A Conceptual Framework for Development of Context-aware Location-based Services on Smart-M3 platform, Ilya Paramonov, Andrey Vasilyev and Eldar Mamedov, YarSU, Russia	
15:30	15m	Verification-Enabling Interaction Model for Services in Smart Space: a TAIS case, Andrew Ponomarev, SPIIRAS, Russia	



15:45	15m	Design of Semantic Information Broker for Localized Computing Environments in the Internet of Things, Ivan Galov, Aleksandr Lomov and Dmitry Korzun, PetrSU, Russia
16:00	15m	Industrial Cyber-Physical System for Lenses Assembly: Configuration Workstation Scenario, Alexey Kashevnik and Nikolay Teslya, SPIIRAS, Boris Padun, Kirill Kipriyanov and Valery Archhipov, ITMO, Russia
16:15	15m	Proposed approach for organizational structure of sensor networks, Aleksandr Gorbachev, Eugene Ermakov and Sergey Panasura, Tyumen University, Russia
16:30	15m	Feasibility Study of the THz Band for Communications between Wearable Electronics, Vitaly Petrov, TUT, Finland
16:45	15m	On Mobile Bluetooth Tags, Dmitry Namiot, MSU, Russia, Manfred Sneps-Sneppe, Ventspils University College, Latvia
17:00	15m	Coffee break
17:15	1h	Invited talk: Storage Evolution in IT: Innovations from EMC Corporation by Artur Vartanyan, EMC Corporation, Main Conference Hall (2 nd floor)
18:15	15m	Coffee break
Session: Demo Pitches: Presentation in Pecha Kucha format		
Room: Main Conference Hall (2nd floor)		Chairman: Ilya Paramonov
18:30	5m	Lego Mindstorm EV3-Based Pick-and-Place System, Sergey Mikhailov, ITMO University, Russia
18:35	5m	An implementation of CoAP protocol for Arduino and ESP8266, Alexey Andreev, Dmitry Mouromtsev, Kolchin Maxim, Nickolay Klimov, Daniil Garayzuev and Ivan Shilin, ITMO University, Russia
18:40	5m	Android e-Tourism Application Tourist Assistant - TAIS, Maksim Shchekotov, SPIIRAS, Russia
18:45	5m	Robots Interaction in Smart Space: Object Finding Scenario, Nikolay Teslya, SPIIRAS, Russia
18:50	5m	Walky Doggy, Ksenia Lagutina, Yaroslavl State University, Yaroslavl, Russia
18:55	5m	Open Karelia - An Informational Portal for Museums, Ilya Paramonov, Eldar Mamedov, Sergey Averkiev, Ivan Shchitov, EverestMD LLC, Kirill Krinkin and Mark Zaslavskiy, FRUCT LLC, Russia
19:00	5m	New Moscow Landmarks: Cultural Information System, Ilya Paramonov, Sergey Averkiev, Ivan Shchitov, Daria Roychikova, EverestMD LLC, Kirill Krinkin and Mark Zaslavskiy, FRUCT LLC, Russia
19:05	5m	Training Assistant: An Automatic Training Data Gathering System, Nikita Timofeev, YarSU, Russia
19:10	5m	Development of the Web-based Doctor Workplace for the Heart Function Monitoring Service, Yulia Zavyalova, Nikolay Lebedev, Alexander Borodin, PetrSU, Russia
19:15	5m	"Tap2smart": a New Authentication Method for Modern Smartphones, Maxim Grankin, Maria Shelest, Evgeny Bakin and Grigory Evseev, SUAI, Russia
19:20	10m	Break and Preparation to Demo Session
Session: Conference social event combined with Demo session		
Room: Main Conference Hall (2nd floor)		Chairman: Ilya Paramonov
19:30	1.5h	Demo Session and Social Event
21:00		Closing of Day 4

April 24 (Friday)

Yaroslavl State University, Sovetskaya st. 14, 150000 Yaroslavl

09:00	30m	17th FRUCT Conference Registration
Session: Network Technologies		
Room: Main Conference Hall (2nd floor)		Chairman: Nikolay Teslya
09:30	15m	Cognitive Wireless Mesh Network without common control channel evaluated in NS-3, Dick Carrillo, Research and Development Center - CPqD, Brazil
09:45	15m	Prototype of the telematics map cloud service, Serge Popov, Vadim Glazunov, Leonid Kurochkin and Mikhail Chuvatov, SPb Politechnic, Russia
10:00	15m	A New Trade-off Scheme for MIMO OFDM-based Cognitive Radio Systems over Correlated Fading Channels, Makan Zamanipour, IEEE Member, and Saeed Mashhadi, Sharif University of Technology, Iran



10:15	15m	EventBus Module for Distributed OpenFlow Controllers, Igor Alekseev, YarSU, Mikhail Nikitinskiy, A-Real Group, Energia-Info Inc, Russia
10:30	15m	Modeling Stateless Transport Protocols in ns-3, Dmitry Chalyy, YarSU, Russia
10:45	15m	Improved Algorithm for Identification of Switch Tables in Executable Code, Andrei Gedich, Arcadia, Artur Lazdin, ITMO, Russia
11:00	15m	A Simple Information Flow Security Model for Software-Defined Networks, Dmitry Chalyy, Evgeny Nikitin and Ekaterina Antoshina, YarSU, Russia
11:15	15m	Coffee break
Session: Embedded Systems and Networks I		
Room: Main Conference Hall (2nd floor)		Chairman: Vitaly Petrov
11:30	15m	Adaptive Data Streaming Service for Onboard Spacecraft Networks, Ilya Korobkov, SUAI, Russia
11:45	15m	Second Revision of the STP-ISS Transport Protocol for On-Board SpaceWire Networks, Yuriy Sheynin, Valentin Olenev, Irina Lavrovskaya, Ilya Korobkov, SUAI, Sergey Kochura, Sergey Openko and Dmitry Dymov, JSC Reshetnev Information Satellite Systems, Russia
12:00	15m	Scheduling mechanisms for SpaceWire networks, Ilya Korobkov, Elena Podgornova, Dmitry Raszhivin, Valentin Olenev and Irina Lavrovskaya, SUAI, Russia
12:15	15m	Performance Comparison of Selected Wired and Wireless Networks on Chip Architectures, Maria Komar, TUT/YarSU, Finland/Russia
12:30	15m	SpaceWire network support algorithm as part of decentralized Plug-and-Play algorithm, Elizar Fortyshev and Ksenia Khramenkova, SUAI, Russia
12:45	15m	Protocol for Connection Ethernet Interface to SpaceWire Networks, Evgeny Yablokov, Valentin Rozanov and Alexey Vinogradov, SUAI, Russia
13:00	1h	Lunch break (on your own)
Session: Embedded Systems and Networks II		
Room: 304		Chairman: Ilya Korobkov
14:00	15m	Tasks of Decentralized SpaceWire-Plug-and-Play Algorithm, Ksenia Khramenkova, Elizar Fortyshev, SUAI, Russia
14:15	15m	Platform-Based Embedded Solution for Small Satellite's Onboard Computing, Olga Mamoutova, Alexander Fedotov, Alexey Filippov and Alexander Antonov, SPb Politechnic, Russia
14:30	15m	System Level Modeling of Dynamic Reconfigurable System-on-Chip, Nadezhda Matveeva, Elena Suvorova, Alexey Rabin and Valentin Rozanov, SUAI, Russia
14:45	15m	Domain-Specific Approach to Software Development for Microcontrollers, Boris Sedov, Alexey Syschikov, Vera Ivanova and Sergey Pakharev, SUAI, Russia
15:00	15m	The Network Calculator for NoC Buffer Space Evaluation, Nadezhda Matveeva, Elena Suvorova, Lev Kurbanov, Yuriy Sheynin and Valentin Rozanov, SUAI, Russia
15:15	15m	Fast static performance analysis of parallel program schemes, Alexey Syschikov, Boris Sedov, Vera Ivanova, Yuriy Sheynin and Sergey Pakharev, SUAI, Russia
15:30	15m	Coffee break
Session: Image processing and machine vision		
Room: 304		Chairman: Andrey Vasilyev
15:45	15m	An Algorithm for Quality Assessment of Images, Ivan Mochalov, Andrew Priorov and Alexandr Prozorov, YarSU, Russia
16:00	15m	Influence of Packets Losses on Video Quality in Case of Using Multiple Description Coding with Time Division into Two and Three Substreams, Alexey Tarakanov, Olga Gushchina and Ilya Nenakhov, YarSU, Russia
16:15	15m	The Development of the Obstacle Detection Monocular TV System in Virtual Environment for a Mobile Robot, Alexander Tyukin, Ilya Lebedev, Alexandr Prozorov and Andrew Priorov, YarSU, Russia
16:30	15m	Eye Center Localization on a Facial Image Based on Multi-Block Local Binary Patterns, Anatoly Nikitin, Vladimir Khryashchev, Olga Stepanova, YarSU, Igor Kosterin, Fire and Rescue Academy, Russia
16:45	15m	Multi-Focus Image Fusion Based on Cellular Automata Method, Andrey Noskov, Elena Aminova and Vladimir Volokhov, YarSU, Russia
17:00	15m	Official closing of the 17th FRUCT conference, Room 304



Demo Session of the 17th FRUCT conference

Time: 23 April 2015, 19:00-21:00

Place: Yaroslavl State University, Sovetskaya st. 14,
at the Main Conference Hall (2nd floor)

The Demo section of the 17th FRUCT conference will be combined with the demo session of the Regional seminar on Mobile Healthcare, early diagnostics and fitness and with the conference social event. The first part is a promotional section to present/introduce demo projects to the public. Presentations will be done following the Pecha Kucha style. Main idea of this section is to make people aware of the demo and become interested to visit the demo stand at the second part of the session. During the second part of demo session teams get a place to install the demo and poster. If you have some special requirements please contact organizing committee by email info@fruct.org.

Pecha Kucha Presentation Format

Pecha Kucha is a presentation technique where a speaker shows a definite number of slides (usually 20 or 15), each for 20 seconds. The slides are changed automatically during the talk. The main intention for Pecha Kucha presentation style is to prevent participants from being too verbose and to make their talks more dynamic and impressive.

Pecha Kucha Night is an event where each speaker uses Pecha Kucha presentation, and speakers change each other in non-stop fashion. Initially invented by architects, this kind of event is often used to present creative projects or work; nowadays it is also used for R&D talks too. Pecha Kucha Night format allows all participants to make announcements about their demos in attractive and time-efficient way. That is why we have chosen this format for demo promotion section at FRUCT conference. More information can be found at <http://www.fruct.org/demo17>.

How to prepare Pecha Kucha presentation

Here is an instruction on how to prepare your Pecha Kucha style presentation for Demo promotion section. Your presentation must contain exactly 6 slides, and each of them will be displayed for 20 seconds. The slides will be changed automatically. So, the whole presentation will take exactly 2 minutes (it should be noted that usually Pecha Kucha presentation has 20 slides, but we have to reduce the number due to a large amount of submitted presentations). Provide the information about yourself and your presentation on the first slide (name, institution, title of your presentation).

The main purpose of your talk would be to interest people, so your presentation should make absolutely clear the main ideas of your project and explain what you plan to show at the demo stand. Make your presentation fascinating to attract attendees and avoid technical details in your talk. Reveal one main idea on each slide. Do not overload your slides with information. Remember, that each slide is displayed only for 20 seconds. Place no more than 2 lines of text per slide, or one big picture. Avoid using slide titles. Do not duplicate the same slides in your presentation — it is cheating! If you see that 20 seconds for a particular slide is not enough for you, try to decouple it into the two or more, or omit the details. Do not place “Thank you” or “Q&A” slides in the presentation. Pecha Kucha session does not imply any questions from the auditory. All the questions will be asked afterwards in a poster room. Prepare your speech thoroughly and beforehand. As you have only 20 seconds per slide, it is quite impossible to improvise during the talk. Rehearse your speech several times to be sure in the absence of pauses when you wait for the slide change, or accelerations when you fails to follow your slides. Try to speak in the same pace during all the presentation. It definitely depends on your text, so try to prepare near the same amount of text in speech for each slide.

Check list

- Use exactly 6 slides.
- Place information about yourself and your presentation (name, institution) on the first slide.
- Reveal one main idea on each slide.
- Place no more than 2 lines of text or 1 large image per slide.
- Do not duplicate the same slides, do not place “Thank you” or “Q&A” slides in the presentation.
- Do not use any slide change animation.
- Prepare your speech thoroughly and do not forget to rehearse it.



List of Demos (*preliminary list based on submissions done before April 12*)

1. ***Lego Mindstorm EV3-Based Pick-and-Place System, by Sergey Mikhailov, ITMO University, Russia***

Presented pick-and-place system is based on smart space technology is used, which allows providing information for sharing between different services of the system. This technology aims in the seamless integration of different device by developing of ubiquitous computing environments, where different services can share information with each other, make different computations and interact for joint tasks solving. The open source Smart-M3 platform has been used for organization of smart space infrastructure for robots self-organization. Usage of this platform makes it possible to significantly simplify further development of the system, include new information sources and services, and to make the system highly scalable. The key idea of this platform is that the formed smart space is device, domain, and vendor independent.

The system consists of two types of robots: pipeline robot and manipulating robot. The robot form the first type is stationary and has a pipeline that moves objects from the location to the destination. It has a color sensor that determines the color of the moved object. When the robot is moving the object, the pipeline velocity is shared with the smart space. When the object is moved to the destination point and it is ready for manipulation by the manipulating robot, the related triple is shared with smart space by pipeline robot.

2. ***An implementation of CoAP protocol for Arduino and ESP8266, by Alexey Andreev, Dmitry Mouromtsev, Kolchin Maxim, Nickolay Klimov, Daniil Garayzuev and Ivan Shilin, ITMO University, Russia***

The device prototype is a open software and open hardware that implements RFC 7252 Constrained Application Protocol (CoAP, <http://tools.ietf.org/html/rfc7252>) for devices with limited resources to bring Semantic Technologies (<http://www.w3.org/standards/semanticweb/>) to the world of the Internet of Things (IoT). Like HTTP for small devices, CoAP is based on the REST model: servers make resources available under a URL, and clients access these resources using methods such as GET, PUT, POST, and DELETE via UDP.

The main developing library is called microcoap (<https://github.com/1248/microcoap>). Microcoap is a small CoAP implementation for microcontrollers, such as Arduino boards. CoAP GET, PUT, POST and DELETE methods are already available in the microcoap implementation. The resource subscribe option, appropriate endpoints setup and additional fixes (such as full-fledged CoAP clients support), which are developing in the project, are required.

The hardware is also developing to provide the full testing experience. Current prototype is based on the Arduino MEGA 2560 with connected ESP8266 WiFi-Module (used library: https://github.com/itead/ITEADLIB_Arduino_WeeESP8266) and DHT11 temperature and humidity sensor (<https://github.com/niesteszeck/idDHT11>). The additional fixes for the ESP8266 Arduino library are also adding during developing.

The device prototype is developing in the context of SemIoT project (<http://semiot.ru>). The future plans list contains a task to develop addition wireless device configuration (a mobile app that provides devices configuration option).

Semantic technologies for Internet of Things Project (SemIoT) of Laboratory ISST dedicated to the development of the prototype scalable service-oriented software and hardware platform based on wireless sensor networks and agent-based, semantic web technologies and cloud computing in order to aggregation, normalization, analysis and visualization of large amounts of heterogeneous structured, semi-structured and unstructured data in a distributed network of electronic consumer devices (Internet of Things). SemIoT project is funded by a grant under the Russian Federal Target Program "Research and development in priority areas of scientific and technological complex of Russia for 2014-2020".

3. ***Android e-Tourism Application Tourist Assistant - TAIS, by Maksim Shchekotov, SPIIRAS, Russia***

This demo presents an e-Tourism application for supporting a tourist in a region. The application recommends the tourist attractions that are interested to him/her based on the tourist preferences and the current situation in the region. Attractions and their descriptions & images are extracted from accessible Internet sources (like Wikipedia, Wikivoyage, Panoramio). They are ranged by the recommendation component of the application. Recommendations are based on ratings set by the tourists that use the application. The paper describes the ser-vice-based application architecture, ontology for intelligent tourist Assistant services interaction, and evaluation. Developed application is accessible for download in Google Play market for Android device users.



4. Robots Interaction in Smart Space: Object Finding Scenario, by Nikolay Teslya, SPIIRAS, Russia

The demo provides the enhanced version of interaction model of devices in smart space that was presented on FRUCT 16 conference. These devices are robot vehicles constructed with using of the Lego® Mindstorms EV3 construction kit with ultrasonic and gyroscope sensors. Each vehicle is driven by two independent large motors and controlled by control block with LeJOS installed on the SD-card. WiFi USB-adaptor provides local area network connection. For the control block the LeJOS has been chosen because it is provide full functionality OS with JRE Environment. Robots shares information through the Smart-M3-based smart space via using the Java KPICore library.

Robots have been enhanced by including compass into the set of used sensors. It allows improving navigation in the physical space through adding one more coordinate system concerned with the Earth magnetic field. This improvement helps to collect more data that can be used to increase the search precision of objects around the robots.

5. Walky Doggy, by Ksenia Lagutina, P.G. Demidov Yaroslavl State University, Yaroslavl, Russia

Walky Doggy is an activities stimulating fitness application for devices on Android platform, which forces the user to take walk exercise by emulating behavior of a dog that needs to go outside for a walk. The main aim of the application is to motivate user to go for a walk every day at the same time. Such regular walking, on the one hand, are one of the simplest types of physical activity that can be done by anyone. On the other hand, it was proven that regular walking allows to reduce the risk of different diseases and disabilities, has positive effect on immune system, emotional status and quality of life.

The main idea of the application is based on the fact that acquiring a dog leads to regular everyday dog walking. However, acquiring a dog can be a difficult burden for the aged people, as dogs require much care, such as feeding and veterinary medicine. Moreover, having a dog complicates the mobility possibilities for its owner, as the dog cannot be leaved alone for the time of the trip. Lastly, sometimes people just cannot acquire the dog because of the allergy. All of these restrictions can be overcome with Walky Doggy application that provides a virtual dog with the only need - need for a walk.

Walky Doggy allows user to set up the times, when he or she wants to walk a virtual dog. When time comes for a new walk, application notifies the user about it with the dog barking and a message in the status bar of the smartphone. If user ignores this notification, application starts to attract user's attention more actively by increasing the volume and intonation of barking. Such kind of actions emulates real dog behavior.

During the walk the user can see the walk progress as the time left for walking. Moreover, Walky Doggy provides step counter feature that allows to show the number of steps of the current walk.

6. Open Karelia - An Informational Portal for Museums, by Ilya Paramonov, Eldar Mamedov, Sergey Averkiev, Ivan Shchitov, EverestMD LLC, Kirill Krinkin and Mark Zaslavskiy, FRUCT LLC, Russia

Open Karelia is an informational portal powered by Geo2Tag platform. The portal provides information in 3 languages: English, Russian and Finnish. It brings together museums from the Karelian region shared between Russia and Finland. Currently top 10 regional museums participating in the system: National Museum of Karelia Republic, Kizhi Museum, North Karelia Museum, Outokumpu Mining Museum, etc.

Open Karelia allows users to select museum via its location or exhibit of interest and to find out extended description. On the museum page visitor can see its history, exhibitions, excursions, work schedule, ticket pricing, contacts, location on map, indoors plan, links to social networks and to museum own site. Previews of current exhibitions and excursions are displayed on the page allowing to briefly get information on their theme, time and location.

The core of the information system is information about exhibits stored in the museums. Exhibits belong to one of 5 categories: folk culture, stone and architecture, war, transport links, and deposits. Visitors can see objects scattered on the map or pick one from the museum description page or lucky roulette on the main page. When selecting an exhibit the user may study its identification card. The page displays exhibit description, category, class, type, dating, location on the map and list of similar objects from other museums. Object's similarity is determined by a set of different factors including automatically inferred tags. The portal allows user to search exhibits using a set of filters including name, category, museum and visualises this information as a list or on the map. Visitors may see the exhibits on the timeline where concrete element takes place in accordance with its date mark. All searches including timeline and map pages allow to quickly filter out elements based on the category or type.



Open Karelia tightens exhibits together with the tag system. Visitor can observe tags on the object page and special page that displays top 50 tags. When clicking on a tag, the system shows all the objects that have the same tag. *More detailed description could be found in the conference proceedings.*

7. New Moscow Landmarks: Cultural Information System, by Ilya Paramonov, Sergey Averkiev, Ivan Shchitov, Daria Roychikova, EverestMD LLC, Kirill Krinkin and Mark Zaslavskiy, FRUCT LLC, Russia

New Moscow Landmarks (<http://www.novmosdata.ru/>) informational system provides users with information about cultural attractions that are located in new areas of Moscow. All objects in the system are divided into three types: places (cultural, historical, sport, industrial, food and accommodation places), events (exhibitions, festivals, shows, etc.) and tourist routes. The system gives detailed information about all types of landmarks: text description, contact information, photographs, video and audio files, links to external resources, location on the map and other individual properties of each type.

For orientation within the general list of attractions users can select objects by category or other parameters, or use the search box. In addition to searching and browsing through interesting landmarks users can also create groups of their favorite objects, as well as develop custom routes based on their favorite places. Moreover, full functionality is available both for the PC and for various mobile devices.

For adding new places, current events and routes or for editing existing ones the system provides an administrative interface with a set of handy tools. Via these tools it is also possible to add informational and advertising banners.

8. Training Assistant: An Automatic Training Data Gathering System, by Nikita Timofeev, YarSU, Russia

Training Assistant is a system that allows users to automatically track their progress in using weighted training machines. Automatic data gathering allows users to focus on correct execution of exercises during the training and not on the recording process. After the training he/she may see the progress and update the program for the next workout.

To collect data on the user's training, the Training Assistant system contains a special device that attaches to the training apparatus. The device called repeat detector gathers required data from sensors attached to training machine: the weight that has been lifted by the user and the number of lifts. This data is then collected through the special dispatcher on the web-server for later review and summarization.

We will present our system on a universal training machine that support more than 16 exercises with our special device attached to it. During the demo session participants may try to use the system: identify them with help of a special bangle, perform an exercise and then review training statistics through the web interface.

9. Development of the Web-based Doctor Workplace for the Heart Function Monitoring Service, by Yulia Zavyalova, Nikolay Lebedev, Alexander Borodin, PetrSU, Russia

Continuous remote health monitoring provides a promising way to construct a complete picture of individual's state of health and to get notifications in the case of worsening happen.

For these purposes CardiaCare smartphone app was developed at PetrSU.

It receives ECG data from personal monitoring device via Bluetooth in real-time. However, the application just processes cardiogram recordings on the smartphone and sends the alarm if some kind of arrhythmia is identified. The important problem is to provide a cardiologist with an interface to the personal medical data organized as electronic health records.

This demonstration is devoted to the development of web-based doctor workplace for the heart function monitoring service. It implements the following functions: to examine electrocardiograms, to deal with annotations, to receive notifications from system about problems.

Web-based workplace allows doctors to be notified about different patient's events and react on them.

10. "Tap2smart": a New Authentication Method for Modern Smartphones, by Maxim Grankin, Maria Shelest, Evgeny Bakin and Grigory Evseev, SUAI, Russia

Nowadays, besides being used as phones, smartphones involve a lot of such important additional functions as being organizer, valet, ID etc. That is why the users are to be sure, that their personal data kept in a smartphone is reliably protected in case of device loss or theft. One of the basic security mechanisms is a lock screen and modern smartphone has a lot of different lock screen options (e.g. PIN, pattern etc.). In this paper we consider a new user hybrid authentication scheme based on tapping the rhythmic password on a lock screen. For the scheme we propose a decision making algorithm based on statistical analysis of tapped sequence which provides a high steadiness and a continuous adaptation to a user. *More detailed description could be found in the conference proceedings.*

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CALL FOR PARTICIPATION

18th Conference of Open Innovations

Association FRUCT

Saint-Petersburg, Russia, 18-22 April 2016



Overview

FRUCT is the largest regional cooperation framework in form of open innovations between academia and industry. FRUCT conferences are attended by the representatives of more than 20 FRUCT member universities from Russia, Finland, Denmark, Italy, Ukraine, industrial experts from EMC², Intel, Nokia, Skolkovo and a number of guests from other companies and universities.

The conference is an R&D forum for the most active students, academic experts, industrial researchers and influential representatives of business and government. The conference invites the world-class academic and industrial researchers to give lectures on the most relevant topics, provides an opportunity for student teams to present progress and results of their R&D projects, meet new interesting people and form new R&D teams. The conference program consists of 3 to 5 intensive (½ or full day) trainings on the most promising technologies, plus 3 days of the main conference.

We warmly welcome all university research teams to participate in the conference, present your research and join the FRUCT Association. IEEE members and representatives of Russian and Finnish universities are entitled to large discounts. Registration to the conference is open at <http://www.fruct.org/conference18>.

Background and motivation

The distinctive feature of modern IT and Telecommunications industries is in dramatic shortening of the period when technology remains commercially viable. On the one hand, this is due to the competition between key market players that are pushing all manufacturers to accelerate innovations; on the other hand, this is due to technological progress speed up caused by the growing expansion of intellectual resource invested into R&D and design activities. This trend is an important call and challenge for the leading educational and research institutions around the globe. In the FRUCT we believe that it is crucial to combine forces of EU and Russia to follow up the competition in adopting university education to the new industrial trends. The first step is to strength a bridge between Russian and Finnish academic worlds, increase visibility of involved research teams and set direct personal contacts between academic and industrial experts. More information about FRUCT is available at www.fruct.org.

Call for papers and presentations

You can select one of the following 3 types of submissions:

- Full papers (min 6 pages and up to 12 pages) - submission deadline is **December 15, 2015**
- Extended abstracts (min 200 words, max 5 pages) - submission deadline is December 15, 2015
- Poster or demo summary (min 200 words, max 5 pages) - submission deadline is April 2, 2016

All submitted papers will be peer reviewed by the technical committee. Please follow provided paper templates.

The list of priority topics is as follows:

- Location Based Services, Navigation, Logistics management, e-Tourism solutions
- Mobile Healthcare, Wellbeing, Automated diagnostics, Fitness, e-Health solutions
- Future services: Proactivity, IoT, Smart Spaces, Context Analysis, Recommender systems, Big Data, Data Mining
 - ✓ Energy efficient design of sensors, integration of peripherals
 - ✓ Cross-platform software, innovative mobile services, new approaches to application design, innovative UX
- Smart Systems, Inter-device connectivity, embedded networks

The list of additional topics is as follows:

- Mobile device security, management of personal and business privacy
- Modern network architectures, Emerging wireless technologies, Air interfaces and protocols
- Mobile multimedia and video services and solutions

All conference papers and abstracts will be published in FRUCT proceeding (ISSN 2305-7254), all Full papers will be published in IEEE Xplore (Scopus) and selected papers recommended (but not guaranteed) for CPCI indexing (Web of Science). The templates, conference news and other details can be found at <http://www.fruct.org/conference18>.