

Finnish-Russian University Cooperation Program in Telecommunications (FRUCT)



What is FRUCT

- Community
- Incubator of competences
- Chance for students to realize scientific and R&D ambitions
- Framework to set strategic partnership between industry and universities
- Promotion of Baltic region without borders idea and social responsibility



Mission

- Help in building bridge between Finnish and Russian academic worlds
- Increase visibility of involved research teams in both countries and help in establishing direct personal contacts
 - Support publishing best student works at world top conferences
- Exchange experience and best practices in education and R&D
- Establish direct contacts between university and industry people
- Promote telecom and mobile devices oriented research and technologies
- Involve students in industry oriented research projects
 - Provide students with advanced technological training
 - Find best university and industry supervisors for the student projects
 - Help to identify niches for new startups and show what support students can get if they decide to establish own business
- Provide students with a framework for realize their R&D ambitions
- Make this program be an “incubator of new competences”



History and Background

- The program started as collaboration project between Turku University (TUCS) and St. Petersburg State University of Airspace Instrumentation (SUAI)
- In 2006 Nokia's University Collaboration program in Russia joined the program
 - Together we decided to go for open academic-industrial association in Telecom
- The program is primary targeted in Russian and Finnish academic participants, but participation from other countries is also welcome
- We are targeted in exchanging and developing competences that is achieved by making joint projects and organizing regular info sharing events (seminars)
- Before it takes final shape we will keep FRUCT informal and fully open program
 - There is no formal agreement and membership fee, if your university team wants to join us, just define in what activities you want to participate and let us know
- The program defines two levels of membership
 - Full-members – expected to be active in program activities between the meetings, participate in project work (with students and professors) and seminar preparation
 - Observers – welcome to follow program's progress and participate in seminars



Program Members

- **Full-members**

- **University members**

- [St. Petersburg State University of Airspace Instrumentation](#) (SUAI), contact person: [Sergey Semionov](#)
 - [University of Turku](#) (TUCS), contact person: [Alexey Dudkov](#)
 - [St. Petersburg State Electrotechnical University](#) (LETI), contact person: [Dmitrij Gaivoronskij](#)
 - [University of Oulu](#), contact person: [Behnaam Aazhang](#)
 - [Helsinki University of Technology](#) (HUT), contact person: [Natalia Ermolova](#)
 - [Tampere University of Technology](#) (TUT), contact person: [Yevgeni Koucheryavy](#)
 - [Bonch-Bruевич St. Petersburg State University of Telecommunications](#), contact person: [Alexey Grudinin](#)
 - [University of Jyväskylä](#), contact person: [Vitaliy Tykhomyrov](#)
 - [St. Petersburg State University](#), contact person: [Nikolai Toivonen](#), [Katherina Chizhova](#)
 - [Moscow Technical University of Communications and Informatics](#) (MTUCI), contact person: [Vladimir Deart](#)
 - [Petrozavodsk State University](#) (PetrSU), contact person: [Anton Shabaev](#)
 - [Institute for Information Transmission Problems of the Russian Academy of Sciences](#), contact person: [Alexey Vinel](#)

- **Industry members**

- [Nokia Research Center & Universities Cooperation Program in Russia](#), contact person: [Sergey Balandin](#)

- **Observers**

- **University members**

- [St. Petersburg State Polytechnic University](#)
 - [EVTEK university of applied sciences](#), contact person: [Ingmar Tollet](#)

- **Industry members**

- [Symbian Ltd](#) & Symbian Academy, contact person: [David Roberts](#)



How does it work

- Any representative of the full-member organization can propose a new project
- Project can be initiated by professor, industry expert or by any student
 - When professor initiate a project, he/she has to become supervisor of the team
 - When project proposal comes from industry expert, he/she takes obligation to be team's tutor
 - When students come with idea of new project they can ask for supervisor and/or tutor from FRUCT board
- Project teams can ask FRUCT board for professional advices, results review and other types of help and support, including different types of donations (books, devices, etc)
- The expected main project deliverable is a paper, but depending on the project scope some other deliverables are also possible and appreciated
- Yearly we organize two educational & info sharing seminars (in Russia and Finland)
 - To seminars we invite top experts with lectures on the subjects of program projects
 - The seminar is a place where teams can present their project progress and results
 - The next seminar will be held in May 2008 in St-Petersburg, Russia
- Based on seminar presentations FRUCT board might recommend some papers to publication at world top conferences and Nokia allocates couple of travel grants for this
- For more information about program's structure and work principles please refer to www.fruct.org

Focus Areas

- Modulation, signaling, multiple access (spread spectrum, OFDM, CDMA, multi-carrier etc.)
- Signature ensemble design for high-rate multi-user data transmission
- Practicable codes and coded-modulated constellations nearing channel capacity
- Signal and processing algorithms design for channel piloting and synchronization
- MIMO architectures and space-time coding schemes applicable to 4G interface
- Advanced multi-user receive algorithms
- Simulation of 4G channels and proposed transmit/receive architectures
- Embedded networks
- Network simulation toolkits
- Service design and development, mobile applications and WidSets platform
- Open Source platforms and MAEMO
- Smart Spaces
- Mobile platforms and Symbian

and other areas interesting for students, supervisors and tutors ...



List of Projects

1. WiFi throughput research during the wireless video transmission
2. Laboratory of video transmission
3. Coding in 4G
4. Mobile multimedia broadcasting technologies
5. System level simulator for hybrid broadcast/cellular networks
6. Bandwidth and power efficient OFDM
7. Resource allocation in OFDMA
8. Security in Embedded Networks
9. Software licensing in mobile industry
10. End-to-End Delay Estimations in IP networks
11. Diversity Reception in Microwave Links
12. Polar Modulation and Transmitters Power Efficiency
13. UniPro Power Estimation Model
14. Analysis of WidSets platform opportunities at Russian market
15. Distributed Objects Allocation/Retrieval System for Heterogeneous P2P Network
16. Adaptive error correction scheme for chirp spread spectrum wireless link
17. Adaptive power saving on receiver side in DVB-H system based on JPEG2000 standard
18. Algorithms for the heterogeneous P2P networks
19. Long-term testing for MAEMO platform
20. Speech coding in wireless packet switched network
21. Russian WidSets community



Contact Information

www.fruct.org

fruct.info@gmail.com

Lets make together FRUCT be fruitful cooperation framework!



Seminar practicalities

- Presenters if you haven't submit your presentation already, please do it ASAP, e.g. during coffee-break or lunch
- On May 21st, after afternoon coffee break we have two parallel sessions: R&D Coding theory and Symbian hands-on training
- Social event: May 21, 18:00 – 21:00 Neva boat trip and refreshments
- On May 22nd we ready to organize WidSets training session if there will be **10 or more** registered participants
- **Everyone please use this time to meet your colleagues, talk, create new projects and have fun!**