Finnish-Russian University Cooperation in Telecommunications

WEB: www.fruct.org   **E-Mail:** fruct.info@gmail.com

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Connecting People

What is FRUCT

- Community of students, academic and industrial experts

- Identify niches of world-class R&D and incubator of competences

- Chance for students to realize scientific and R&D ambitions

- Develop strategic partnership between industry and universities

- Promote idea of Europe without borders and social responsibility

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Mission

- **Help building bridge between Finnish and Russian academic worlds**

- Increase visibility of involved research teams in both counties and help in establishing direct personal contacts
    - Support joint projects and 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 & mobile device oriented research and technologies
- Provide students with a framework for realize their R&D ambitions
- Involve students in research projects oriented to industrial needs
    - Provide students with advanced technology training
    - Find best university and industry supervisors for the student projects
    - Help identify niches for new startups and 3rd part support that business can get

- **Program is an incubator of new competences**

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Background

- The program primary serves for Russian and Finnish participants, but participation of other countries is also possible

- Networking, exchange and develop competences in joint projects and at regular info sharing seminars

- For a while we will keep FRUCT informal and fully open program
  - No formal agreement and member fee, if university team wants to join, it should define in what activities want to participate and ask membership

- The program defines two levels of membership
  - Full-members – active all time members of R&D projects and competence building activities, organizers and key contributors of program seminars, entitled to all FRUCT benefits
  - Observers – participate in the seminars, can participate in R&D projects and follow overall program's progress, partly entitled to FRUCT benefits

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Membership and List of Current Members

- **FRUCT membership is invitation based**
  - **Any university or company can apply for an observer status**
  - **Active observers can get full-membership and if full-member is passive for over ½ year, it becomes observer again**

- **Full-members**
  - **University members**
    - St. Petersburg State University of Airspace Instrumentation (SUAI), contact person: Alexey Koren
    - University of Turku, contact person: Alexey Dudkov
    - Petrozavodsk State University (PetrSU), contact person: Anton Shabaev
    - St. Petersburg State Electrotechnical University "LETI", contact person: Kirill Krinkin
    - Tampere University of Technology (TUT), contact person: Yevgeni Koucheryavy
    - Moscow Technical University of Communications and Informatics (MTUCI), contact person: Vladimir Deart
    - St. Petersburg State University , contact person: Nikolai Toivonen, Katherina Chizhova
    - Helsinki University of Technology (HUT), contact person: Natalia Ermolova
    - University of Oulu, contact person: Behnaam Aazhang
    - Bonch-Bruevich St. Petersburg State University of Telecommunications, contact person: Alexey Grudinin
    - University of Jyväskylä, contact person: Vitaliy Tykhomyrov
  - **Industry members**
    - Nokia Research Center & Universities Cooperation Program in Russia, contact person: Sergey Balandin

- **Observers**
  - **University members**
    - Institute for Information Transmission Problems of the Russian Academy of Sciences, contact person: Alexey Vinel
    - EVTEK university of applied sciences, contact person: Ingmar Tollet
    - St. Petersburg State Polytechnic University
  - **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 initiates 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 on October 29-31, 2008 in Finland
- 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

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Benefits for Member Organizations

- It is hard for industry and academy people to find right partner for cooperation, FRUCT provides interface & forum for building trust and setting direct contacts

- FRUCT helps university to identify R&D niches that they can take for cooperation with industrial partner

- FRUCT helps university to incubate new competences mandated by the industry

- It is difficult for universities to keep best students work at the departments, but close partnering with industry provides association with strong brand, practical research tasks and additional resources, which attracts students and helps to solve resource problem

- Industry interested in long-term high risks research done by the universities, would benefit to get closer to the edge of science and early industrial feedback is in mutual benefit as allows right tuning and presenting of new technology

- Academic and Industrial research becoming more open and joint actions for getting stronger visibility and making joint publications is in mutual benefit

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Benefits for Students

- FRUCT projects are supported, e.g. by donations of books, devices, scientific databases and library access, etc.
- FRUCT students can ask for travel grant (fully or partly cover travel expenses, conference fees and accommodation) for participation in a scientific conference or seminar where their article was accepted (*now works only for students of Russian universities*)
- Students of FRUCT universities can join existing projects or organize new. The procedure is easy, just write e-mail to project leader or send project plan to fruct.info@gmail.com
- Students involved in research project can ask academic and industrial experts from other FRUCT members for feedback, advice and professional opinion about their research
- When proposing new R&D project student can ask for a supervisor or an industry tutor
- FRUCT board can help students find reviewer or opponent for MSc/PhD theses done on top of FRUCT projects
- FRUCT has agreements with high class seminars and conferences, where FRUCT projects participate under special conditions and published materials will be in IEEE database
- FRUCT projects can publish articles & other materials via FRUCT publishing infrastructure
- FRUCT projects can request help in finding new project member or tutor, when they need some specific competences or expert knowledge in certain area

Frequently Asked Questions

- Is FRUCT a form of industrial subcontracting?

  - NO, it is about partnering projects where involved parties benefits by getting new competences, visibility and ability to tune research towards actual industrial needs. Nokia provides access to unique knowledge and competences, plus when needed can support in form of different donations (books, devices, etc.) and grants

- What is the ownership status of FRUCT project deliverables?

  - All FRUCT results are PUBLIC DOMAIN and project contributors share author rights

- What if there is clear commercial future of FRUCT project?

  - Then we are talking about FRUCT GRADUATE, as mission of making bridge between corresponding teams and project incubation is completed. Graduates shall mention FRUCT roots in later publications and welcome to present progress at our seminars

- Why does Nokia invest resources in FRUCT?

  - It is part of world donations program targeted in illustrating good corporate citizen altitude, community responsibility and support of academic research; plus it helps implementing principles of open innovation and networking academy and industry

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How Academic Team Can Get Invitation to FRUCT?

1. Candidate team shall select/propose research topic/project for cooperation
   a. When joining existing activity, the team shall propose definition of its niche
   b. When proposing new activity, the team shall define the available and missing competences, request for other resource and expected timeline and deliverables
2. The team shall make the overview presentation about itself and institution, the recommended list of points to present is as follows:
   - General facts about the team and university/organization
   - Present team's cooperation experience and best coop. practices you have had
   - What competences team has and what resources (people, equipment, etc.) is ready to use for FRUCT activities now and in the future
   - Overview of recently done and ongoing projects
3. Appoint your contact person in FRUCT and request FRUCT invitation by email
- Following listed above steps will allow faster integration of a new team into FRUCT activities. In case of questions don't hesitate to ask help via FRUCT info

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Current Focus Areas

- Service design and development, mobile applications and WidSets platform
- Embedded networks
- Open Source platforms and MAEMO
- Smart Spaces
- Network simulation toolkits
- Mobile platforms and Symbian 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

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

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List of On-going 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
22. Open Source and MAEMO laboratory

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Contact Information

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Lets make together FRUCT be fruitful cooperation framework!