

Interview with Mr. Prof. Dr. Eugene Semenkin

Prof. Dr. Semenkin is working at the Institute of Computer Science and Telecommunication of the Siberian State Aerospace University (SibSAU) in Krasnoyarsk. There he is the Head of the Experimental Laboratory of Intelligent Technologies and Adaptation. He is also the Head of the Laboratory of Information and Telecommunication Systems at the Institute of Rocket and Space Engineering and Technologies. In this Interview he talks about various aspects and his experiences of the U5-Program.



What are your research fields, especially actual projects?

Computational Intelligence in complex systems modelling and optimization, automated design of data mining tools, applications in aerospace engineering, computer science, natural sciences, social sciences and other areas. Examples of CI approaches are artificial neural networks, fuzzy logic systems, evolutionary computations, swarm intelligence, bio-inspired stochastic optimization algorithms, etc.

List of the most recent research projects:

1. "Development and investigation of data mining technologies automated design methods based on self-configuring evolutionary and biologically inspired algorithms of optimization", 2015-2017, Russian Fond of Fundamental Research (Project Leader).
2. "Development of a secure data exchange protocol in a distributed data-processing system based on moving target technology", 2014-2016, governmental contract № 14.574.21.0126 (Project Leader).
3. "Self-configuring intelligent technologies based algorithms for computer-aided design of highly reliable systems for analysis, decision support and control of rocket engines fire tests", 2014-2016, State Assignment Project (Project Leader).
4. "Distributed self-configuring multi-agent technologies of intelligent information nets design and control", 2014-2015, governmental contract № 14.574.21.037 (Project Leader).
5. Joint Russian-Slovenian research project "Manpower control strategy determination with self-adapted evolutionary and biologically inspired algorithms", 2014-2015, Slovenian Academy of Science, project BI-RU/14-15-047 (Principal Investigator).
6. Joint Russian-German research project «Distributed intelligent systems of multilingual information processing in dialogue telecommunication systems», 2011-2013, governmental contract № 11.519.11.4002 (Project Leader).
7. Joint Russian-German research project "Models and algorithms for automated design of hardware-software complexes of multilingual information intelligent processing in distributed high-performance systems of space mission", 2011-2013, governmental contract № 16.740.11.0742 (Project Leader).

What does the participation in the U5 Program mean to your University and your institute? What are the main cooperation fields?

Essential expansion of contacts and cooperation opportunities. Transfer from the cooperation of two research groups to a collaboration between departments and institutions. Here I mean the partnership of the UUlM and my university. However, next step is our involving in cooperation with other members of U5 that had no place earlier. Much more opportunities will result in much more possibilities and successes.

Main cooperation fields in research and education for now are related to computer science and applied mathematics. There are objective reasons for this state of affairs. Origins and pre-histories of our universi-

ties are very different. SibSAU has no deep backgrounds in areas of medicine, biomedicine, natural sciences, as well as the University of Ulm never worked with spacecrafts' or rocket engines design and production. However, applied mathematics and computer science are all-purpose fields of research and education, and here both universities have many intersections in education programs, research expertise and members' professionalism. That is why we start from these areas with the hope to expand them further.

Besides of research and education, we could organize joint events in area of culture and sport. The 2019 Winter Universiade, the XXIX Winter Universiade, is scheduled for Krasnoyarsk, Russia. SibSAU has an own stadium, swimming pool, students palace of arts, etc. You are welcome!

Are there any (positive) changes, since you have joined the program?

Yes, certainly. There are many promising changes. In September of this year, one Bachelor student of Uni-Ulm will study at my Department of System Analysis and Operations Research for one semester as well as fulfill his Bachelor research project. This is the first one of our experience which never had a place earlier. Jointly with our colleagues from Uni-Ulm we are working now on an application for a research project that should be supported by German Research Society (DFG) and Russian Fond of Fundamental Research. We never used earlier this way of cooperation. With the support of U5 finance sources, a group of the University of Ulm members will visit SibSAU in November for participation in two our scientific conferences and discussion of their educational activities for the next year when we expect lecturing stay of two UUlms' professors at SibSAU. Motion in opposite direction is also planned. Our joint conference, International Workshop on Mathematical Models and their Applications (IWMMA'2016), that will be organized in 5th time, will be improved till the level of U5 Conference and will involve participants from other countries and universities.

As you can see, there are many positive changes here.

How students and researchers from UUlms or other partner universities could revenue from your participation at the program/staying at your university?

Revenue? Well, the first and main revenue is the luxury. The luxury of the inter-human communication. Our first Uni-Ulm student visitor, Joerg Leier, had already such opportunity when in April and May of this year two groups of students from SibSAU were at Uni-Ulm for one month research stay. Now he is optimistic about his half-year stay in Krasnoyarsk as he has friends there. He is right. Other students from Uni-Ulm could also try it. We were glad to see guests from Ulm and we would be also glad to see them again as well as our new colleagues from Uni-Ulm and other members of U5 from China, Egypt and Moscow.

SibSAU is ready to present Master degree programs (in English) in "Computational Intelligence in Data Mining" and "Aerospace Systems Design" as well as in "International Management" and "Public Relations". Students from U5 partners are welcome to attend. Looking back on our (Uni-Ulm – SibSAU) long-term cooperation we can see that knowledge and skills of our students are very high, so that colleagues from Uni-Ulm many times invited them for PhD studying, four of them were promoted within two last years, one will be promoted in short time, two our PhD students continue their study and more one will be accepted in October. By the way, one of two current PhD students, Anastasia Spirina, fulfils her PhD project in the area of automated evaluation of human-human communication quality, very important topic now. It seems to me that Uni-Ulm has enough "revenue" here and could have more if Ulmer students will study at SibSAU, earn the same knowledge and skills which our students have and come back for PhD studying at home. Certainly, students from China and Egypt are also welcomed; they could also bring home good knowledge and useful skills from Siberia. Some of interesting Master degree programs, e.g. Cognitive Systems, are attractable for our students and Uni-Ulm could get good applicants for these programs.

Certainly, there are many ways to get "revenue" from this collaboration. I can see that in areas of computer science an applied mathematics SibSAU's professors and researchers have complementary experience and expertise and could be immediately included and add their force into perspective and on-going research projects as well as in education programs. Colleagues from U5 could also work in our research projects and

education programs getting so additional knowledge, experience and impressions that could be then used in their home universities.

I am sure that Siberian State Aerospace University will also have the “revenue” from this collaboration and hope that it will be implemented soon and developed fast to reach high level success and bring the pleasure to all (six for now) strategic partners.

I wish every success for all of us!