

## First Traditional Russian Youth Summer School “Control, Information, and Optimization”<sup>1</sup>

PACS number: 02.30.Yy

DOI: 10.1134/S0005117909110162

In the brightest time of year, June 21 to 28, leaving behind the summer exams and forgoing many international conferences that occur at these hot dates, 8 world-famous scientists and 38 young researchers from all of Russia gathered in Pereslavl. For the week, they became participants of the First traditional Russian youth summer School “Control, information, and optimization.” Lately, a lot of people (ranging from high-ranking officials to science well-wishers) have been voicing concerns about attracting and securing young people in the academia. The school was initiated despite the popular pessimistic frame of mind that human resources in science have depleted. Its purpose was to distinguish smart, ambitious, and enthusiastic young researchers and create a possibility for informal communication with leading scientists in the field of optimization and control theory. The title “First traditional” was intentionally provocative; the school was supposed to take in all the best features of Soviet science and develop on these traditions. Organizing the school, we had hoped to make it annual, that is, traditional. We can now say without doubt that the plan has worked, and, therefore, the title has proven true. Speaking of Russian traditions, one cannot help but imagine virgin forests, ancient fortresses, and church domes. All of the above can be found in the city of Pereslavl, which had been chosen to host the School.

The idea of the School appeared long ago; it was supported by the academicians S.N. Vasil’iev and A.B. Kurzhanskii (co-chairs of the School); young organizers of the School and members of the steering committee (chair—B.T. Polyak, secretary—E.N. Gryazina, members—A.P. Kurdyukov, P.S. Scherbakov, E.A. Stefanyuk, A.A. Tremba) contributed a lot with their enthusiasm. The organizers are thankful to the staff of the Pereslavl University, especially to the deputy principal V.N. Yumaguzhina. We were pleased to see the students of Pereslavl University at the lectures.

We are very proud of the lecturers line-up of the School and are grateful to them for the time taken to prepare and deliver the lectures for the School. Today hardly any graduate student can say that he has had the opportunity to meet and converse closely with such scientists as A.L. Fradkov, V.I. Utkin, V.L. Kharitonov, Yu.E. Nesterov, and M.M. Kogan. Each of them had prepared a special mini-course consisting of 2–3 lectures of 1.5 hours each. This allowed to show in detail the problems and state of the art in a certain field of optimization and control theory. Here is the list of courses: cybernetic physics and cyberphysical systems, sliding mode controls and their applications, a new approach to problems with delay, operations research and modern optimization theory, control laws synthesis based on linear matrix inequalities.

Outstanding lecturers are a necessary but not sufficient condition for a successful School. On a youth summer school the participants themselves are key, with their ability to absorb, digest, and further apply an overwhelming amount of new and complex material. We have been looking and

---

<sup>1</sup> The School was supported by the Russian Foundation for Basic Research, project no. 09-08-06801-mob-g.

waiting for the undergraduate and graduate students and young Ph.D.'s who have an experience of individual research, who are interested in sharing the results with colleagues, who are not afraid to receive an objective, highly qualified, and valuable, if perhaps not flattering, review of their work. We had planned to select 25–30 participants, and at first we were afraid we would hardly receive more applications. However, we got almost 100 applications and decided to invite 35 participants (plus 3 more young participants who were members of the steering committee).

The schedule was very tight in both length and substance. Nearly every day, from 9 AM till 7 PM, was spent in various forms of interaction seamlessly blending into one another. In the morning, before lunch, school participants had two lectures. Hours after lunch at the first days of the School were devoted to talks of the participants. The corridor of the university was full of colorful posters, the crowd was lively, and the whole space felt charged with thoughtful looks, insightful remarks, and interesting explanations. The elder scientists, apart from a general review of the work, tried to help the participant to state the problem and show his contribution over the very short duration of the talk (10 minutes). After the poster session the participants received many new insights into their work and in the coming days delivered their talks brilliantly, putting emphasis on the most important ideas. Evenings were spent in roundtable discussions, where important problems of being a young scientist in the modern society were brought up. In the first day of the School Fradkov presented an algorithm of going up to the international level and described in detail how to eat two elephants in five stages while standing on three whales<sup>2</sup> (consult the School's web site for details). It turned out that such an approach for gaining international renown was not unique, as Utkin and Kharitonov described another outlook. Next day, the discussion was resumed during the most memorable roundtable discussion on the lawn in front of the Transfiguration Cathedral, a symbol of Pereslavl. This day we compared Russian and Western educational systems. Polyak reminisced on the life of Moscow State University from the 1960s; Kharitonov and Nesterov, who had worked abroad for a long time, provided an insider's look at the western education and science. Those of the participants who had worked abroad for some time told about what attracted them, amazed, perplexed, or put them on alert. Remarkably, the participants unanimously agree that they did not want to go abroad for life, but working abroad for a few months or years is certainly attractive for a young researcher. Subsequent roundtable discussions were prepared and conducted by the young participants and organizers of the School. M.M. Chaykovskii held a brilliant workshop on writing research papers in English, where the most active participants could come up and demonstrate their ability in English translation. Next day, the School participants could discuss the problems of research cooperation without the pressure of their elders. After a full day, participants gathered on the lawn to continue informal talks, fantasize, joke, get to know each other. Thus, nearly every day was full of activities.

The outstanding talk award went to Yu.V. Fetisova (Yekaterinburg), the brilliant talk award went to N.A. Zaichikova (Samara). S.A. Zhbanov (Lipeck) received the award for a good talk. The best poster award went to A.A. Pyrkin (St. Petersburg). Young participants also participated in the process; apart from numerous questions, each participant graded other talks on a 10-point scale. As a result, D.V. Romaev (St. Petersburg) received the award for a talk that was voted best by the participants of the First School. All winners received books of the School's lecturers, a book about the academician Ya.Z. Tsyarkin, and about the Institute of Control Theory of the RAS. We wanted to encourage active participation and various talents of the school participants, so we awarded special diplomas to the most active and captious participant of the School, gave out diplomas for basic eridution, serious approach, rich experience, creative thinking, persuasiveness, and the most artistic presentation.

---

<sup>2</sup> "On three whales" is a Russian idiom equivalent to "on three pillars," meaning the whales on which the world presumably rests.

It would be best to ask the participants themselves about what the School gave to them. Fortunately, we have such a possibility, because after the School was over participants shared their impressions in special questionnaires, to which we refer next. “The best part was the overall creative and good-natured atmosphere of the School;” besides, participants liked the tight schedule, active lecturers, lack of competitiveness, detailed discussion of the talks and lectures from both theoretical and practical points of view which home university does not provide, and useful comments from the young participants and professors.

The web site Scientific.ru devoted to science in Russia published the following comment during the School. *Today, a youth summer school on one of the sciences is finishing in Pereslavl: <http://sites.google.com/site/traditionalschool/about>. Some, I'd say, provocative romanticity of the organizers can be explained by the fact that they are young boys and girls themselves (except for, naturally, the chair), who have not only done the organizational work “for themselves,” but have called to study almost 40 people from various cities, as far as Vladivostok, selected from almost 100 applications with abstracts. They have thought through everything not only to “support the environment of efficient communication and professional development,” but also to pull the young researchers up to the international level or at least show where it stands. Half of the lecturers are Russians returning from abroad (one of them—forever). It would be worthwhile to write somewhere about how it all went.* The present note is an attempt to fulfill this request.

School Chair, Sc.D. *B.T. Polyak*  
Program chair, Ph.D. *E.N. Gryazina*