

A Flexible Schedule

THE UNIVERSITY OF INFORMATION TECHNOLOGY, MECHANICS AND OPTICS GIVES FREE REIN TO COMPUTER TALENTS

Arkady SOSNOV. Photos: Timur Turgunov, the ITMO University Archive, G. Korotkevich's personal archive

CONVERSATIONS AS A WORKOUT

Almost everything written about Gennady Korotkevich in the Russian version of Wikipedia is correct. At the age of 23 he has won many international programming competitions under the auspices of Google, IBM, Facebook, VKontakte, Yandex, the Mail.Ru group and the world leader in the ratings CodeForces. Gennady, though, prefers the entry in the English Wikipedia — it is shorter and more accurate, which suits his pedantic character.

For example, according to the Russian Wikipedia he gave his medals to the Museum of Byelorussian Statehood. 'I have given some of them, but not all', elaborates the champion, 'just the three gold medals I won in computer science olympiads at school'. He has taken some of the trophies from his student years home to Gomel and keeps some in St. Petersburg. He now has so many medals that it is time to compile an inventory.

He solved his first problem at the age of eight, which was when he chose the nickname *tourist* by which he is known in the programming community — it was the trademark of his skis as a child, and he began writing programs in junior school. In his third year at school (including the zero grade) he won a prize at the Belarus School Olympiad. Since then journalists' interest in him has not abated, nor has Gena's desire to avoid contact with them. It is because 'not only do they print lies, but even those of your colleagues who promise to send me their text in advance don't do it'. The undertaking 'I'll definitely send it' has become meaningless.

He was particularly annoyed by a version that his father (Gennady's parents are also programmers) had invented an educational computer game for him. He did not actually invent a game, but he did help him. Journalists delighted in reporting that



Gena Korotkevich. 2006.

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he had jumped straight from the second class to the fourth, but that was also untrue — it was just that all the classes had been renumbered during the reform of schools.

In the interest of fairness: this unique lad never leaves journalists in peace! Incredible as it may seem, he won gold medals for six years running at international school olympiads (International Olympiads in Informatics), becoming absolute champion on three occasions, and was given the unofficial title of the Byelorussian genius. It is amusing that Korotkevich is still called a wunderkind, as though he were still a child. While a student at the ITMO University in St. Petersburg he has twice been world champion as part of a team at ACM ICPC (Association for Computing Machinery International Collegiate Programming Contests) — in 2013, his first year at university, and in 2015. Why only twice? Because under the rules of these competitions nobody can compete in them more than twice!

In the intervening year (2014) *tourist* won the Great Programmer's Helmet after winning the world's five major professional competitions. His comment: 'It can't happen year after year. I was just lucky to a certain extent at that time.' But the pace did not slacken after that: he won six tournaments in 2016, including the prestigious Google Code Jam for the third time running, for which he earned \$15,000.

Why did he miss the ACM ICPC in 2014 (the ITMO team did not win it without him)? Did he take a break to study? Did he go in pursuit of prizes at professional tournaments? Was there any conflict with the team? This was just one of the subjects I wanted to clarify...

Such personnel are in great demand in the economy. Global corporations entice them with conceivable and inconceivable benefits (for instance, IBM take on members of prizewinning teams without interview). Russian Minister of Defence Sergey Shoigu invites them to join the armed forces to reinforce the country's



military power with the aid of IT. The university hopes to keep them — let them study science, create start-up businesses or train future champion programmers, like the celebrated trainers Andrey Stankevich at ITMO and Andrey Lopatin at St. Petersburg State University.

'Our lads are in demand at the cutting edge of algorithmic programming which, along with mathematics, is the basic technology of the near future, particularly systems of artificial intellect', says Andrey Lopatin. 'Even those who have not won medals are very adept at creating innovative products. As for the champions, IT companies are prepared to fight among themselves for them.'

'A university graduate who has faced the heat of working as a team in competitions and in training finishes all that at the age of 21–22, and his only problem then is how to choose the best from all his numerous offers of employment', confirms Professor Vladimir Parfionov, Dean of the Faculty of Information Technology and Programming at ITMO.

At the International and All-Russian Schools Olympiads. 2007.

'There were no regular lessons or special systems of learning. My son worked independently and we tried to help him — mainly to guide him to think correctly and explain anything that was difficult. Sometimes it was not easy to explain, but we tried to find a way. That actually applies not only to programming: if a child asks why it is dark at night and cold in winter, you have to take a table lamp and an apple and explain. But Gena's principal trainer was undoubtedly Gena himself'.

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Visiting the journalists.

Seated at the table (left to right):
Andrey Stankevich, Vladimir Parfionov,
Andrey Lopatin, Lidia Perovskaya.

According to authoritative experts, with the development of digital technologies many popular professions and whole spheres of activity will die out. In particular, low-paid work in copying programs will be replaced by mechanical algorithms (the mass reductions in lowly-qualified programmers which have begun in India are the first sign of this trend), so the specialization of Russian software companies in creating high-end solutions will be in even greater demand on the international IT market.

Gena Korotkevich has not yet promised anything to anyone. He is in the second year of his master's degree course and doing what he likes. For example, he is in the university's *What? Where? When?* team captained by Andrey Stankevich (a sporting version, without the spinning top) and, believe it or not, has not yet decided on the subject of his dissertation. This decision has to be approached with respect: a world-beater is not obliged to meet our expectations. Nevertheless, even his supervisors who know him well are distressed by his unpredictability.

'He is an intelligent, modest, well brought-up young man who doesn't know what he wants in life', grumbles Anatoly Shalyto, one of the leading specialists in automata-based programming, Professor in the Department of Computer Technology at ITMO and initiator of the Keep the Best in Universities programme (and Korotkevich & Co. are certainly the best).

CONVERSATIONS IN THE GARDEN

The 'intelligent, modest and unpredictable' lad was waiting for us at the entrance to the Botanical Garden. Not because he is a botanist (ha! ha!) — on the contrary, he likes football and table tennis, which he played as a child (his mother Lyudmila took him to a club) and now uses as the perfect game for developing psychological stability. We had simply chosen a convenient place for a conversation and photographs.

While we enjoyed the wonders of the vegetable world our thoughts were far removed from mathematics. Gennady looked at the citrus trees with curiosity, but quietly passed by the money tree — in fact, he dresses modestly, does not have a car (he has nowhere to go) and since his first year at university has lived in a student hostel not far from ITMO. He does not consider the hostel to be a place of temptations capable of distracting him from his studies and sees no necessity to find a flat of his own (though he has the wherewithal). He says: 'For some the hostel is too crowded, for some it is too noisy, but not for me. I obviously have modest accommodation requirements.'

Korotkevich shares a room with Artyom Vasiliev, a postgraduate who was also a member of the champion team in 2015. My suggestion that they talked about programming all evening was immediately repudiated: 'Sometimes we talk, but sometimes we sit in silence, each with his own laptop'. There, among the palms and lianas, it dawned on me: Gena is a *tourist*, which means he spends a lot of his time on the Internet where his pleasure gardens are, and he is probably not the same person there as he is in reality. In attempting to understand him this duality has to be borne in mind. I discovered that the websites he visits most frequently are VKontakte, CodeForces, Eurosport, Yandex and Google. Even there he cannot do without sport.

Somewhere between the Mexican cacti and the Vietnamese orchids Gena said that he does not attach particular importance

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to world ratings. His first place is largely a coincidence. It is just like the world's top tennis players — if they win a tournament they confirm their status, if they lose they go down a few places, but can get them back. He was first included in the international ratings in 2006 before he was 12 years old, and knows how changeable the ratings are at the top. The two best-known websites, who compile their own ratings on the basis of their own competitions, in person and by correspondence, are TopCoder and the recently popular CodeForces.

At the time of our 'botanical' meeting in the winter of 2017 TopCoder, the organizer of the World Individual Programming Championships, had Korotkevich in third place, while CodeForces placed him first. On CodeForces, which was developed in Russia, Gena is introduced as the Legendary Grand Master (a title awarded for the achievement of a specific — very high — rating). He has nearly 11,000 friends on the website. (In autumn, when editing this paragraph, I glanced at CodeForces and saw that the *tourist* was still first by a comfortable margin, while in the *last visit* column it showed *now online*. So we had met up again, this time virtually).

In Korotkevich's blog on the same website you can find an entry from five years back: an invitation to visitors to the website to take part in competitions: 'Original tasks have been invented for you by *tourist* and *Romka*. We have tried to emphasize the conceptual element, so we hope that you will have to think longer than just choosing a code.'

This programmers' humour has to be deciphered. Behind the apparently simple wish to 'think longer than just choosing a code' lies a profound meaning with far-reaching consequences. It fully blends into the persona of the Russian programmer who — unlike his Indian counterpart, for example — adores non-standard creative tasks.

'Solving a task is a process that consists of two basic phases,' explained Gennady, standing by a wild agave. 'After reading the conditions you have first to invent a solution algorithm, then

write a program which will accomplish what is prescribed by the algorithm. Tasks, roughly speaking, are divided into two types: in some you have to ponder over the solution for a very long time and the code will be quite short — the simpler the algorithm the more difficult it is to find; in the second type it is the other way round — the idea of the solution is as clear as day, but the algorithm requires a great deal of work, so you write a lot and in great detail. That doesn't mean that such technical tasks don't require you to engage your brain. You can find a simple way of turning the algorithm of the solution into a code — the program will be shorter and the likelihood of a mistake will be less.'

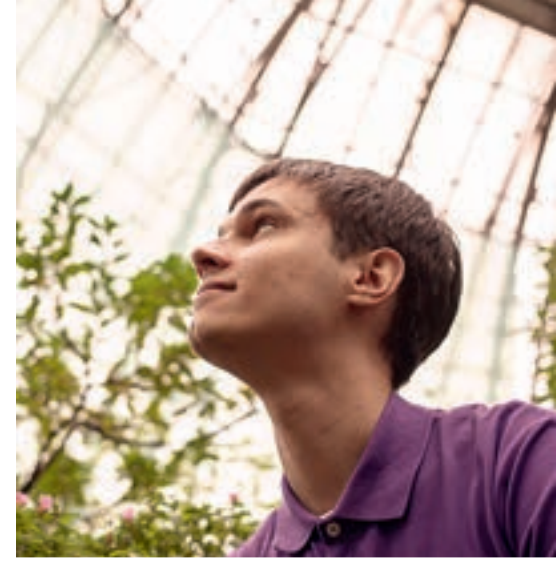
Gena is still composing and selecting tasks: he did this as a member of the jury at the quarter-finals and semi-finals of the 2017 World Championships. This is how he explains the attraction of composition: 'When you solve a lot of tasks you think of ideas that have not yet been tried and have the desire to share them with other participants.' The Legendary Grand Master is clearly not an individualist as he regularly takes part in team competitions (though more frequently in individual ones).

'The combined creativity in team competitions is interesting. When you compete alone you may see a problem and not know what to do with it — sometimes you fall into a stupor, whereas in a team the lads all look at the problem from different angles.'

'But perhaps somebody drags their feet and that could be an irritation.'

'Perhaps I also drag my feet,' he countered. 'I can't remember ever getting angry with teammates. Obviously the higher their standard the more enjoyable it is to compete together. And everyone at ITMO is of a high standard! Even if someone has a problem, part of the essence of teamwork is to sense this and redistribute the responsibility.'

Now here is an interesting detail: in 2014, when Korotkevich missed the ACM ICPC, he competed in some team tournaments as



It is typical that football in Russia, despite the regular failures of the national team, is considered to be the Number One sport, whereas the exploits of our student programmers, who have won twelve world championships since 2000, outperforming the much-vaunted Harvards and Yales and holding off the Chinese dragon, are just ordinary people who are of no interest. Our football clubs employ foreign managers, but these lads hold training sessions all over the world. And if Spain is proud of its star-studded football, what is to stop us making programming our national sport, highlighting the drama of intellectual battles, producing beautiful TV pictures and finally becoming familiar with this area of excellence? All that prevents this, as far as I can see, is the modesty and decency of our computer geniuses...



an individual! And won! The point is that a team of three has one computer and a total of fifteen man-hours for thinking, whereas a lone competitor has only five hours, though the computer for writing the programme is fully at his disposal — an excellent opportunity to test his ability to ‘toil’ for three.

Later I tried to elicit from Andrey Stankevich, who has trained champion teams at ITMO for many years, what the brilliance of the modest Gena consists of. What his answer amounted to was that Gena is an absolute all-rounder with no weak points — he copes with tasks of both types just as easily! Since programming is an extension of real life, in which we are always finding solutions to tasks in our own way, I suggest readers measure this description against themselves:

‘Gennady can solve any problem in his head and, having solved it, write it down — a unique combination of qualities that enables him to dominate. There are lots of clever lads among the olympiad competitors, including mathematicians who can solve any problem, but they encounter difficulties with realization (writing a code is hard). There are very good programmers who can codify various algorithms quickly and elegantly, but they cannot penetrate to the depth of the task or combine things that are known to them in order to find the solution. There are ‘star pupils’ who think well, programme well and after years of persistent training are successful at championships. And then there is the case of Gena Korotkevich, who can think of virtually any solution and programme it very quickly and without mistakes.’

Stankevich told me quite a bit more about his protégé. And I finished my conversation with the master of codes and algorithms in the Botanical Gardens cafe. My final question was: what for him was more important — to beat his rivals or to solve a problem without confining himself to the allotted time?

‘The Olympic principle that taking part is more important than winning still applies, but it all depends on the situation. In the

training process it is more important to solve a problem in order to learn something new, but when I am competing I put maximum effort into winning, whether in programming, football or table tennis.’

‘You’re a sportsman!’

‘Yes, I suppose I am. The exception is intellectual games like What? Where? When? — for me that is not a sport but a means of adding to erudition, developing logic of thought and, of course, having fun in good company.’

The company, it turns out, are all familiar faces: the former competitors and current managers at programming championships play one evening a week. The ‘cognoscenti’ from ITMO, ridiculous as it may seem, are currently in 286th place, but have no complexes about that. Gennady admitted that he personally (only he?) did not have sufficient knowledge in humanities and his native wit was of no help. Some teams deliberately include historians and linguists, but the technical group led by Assistant Professor Stankevich believe in their own strengths...

Bidding a polite farewell the *tourist* went off, probably to the hostel and his laptop. The question of what he wants in life remained open.

But it made me think that St. Petersburg is famous not only for the Hermitage, White Nights and this Apothecary’s Garden of Peter’s that is now the Botanical Garden. Another phenomenon has blossomed before our very eyes — St. Petersburg has raised six two-time world programming champions (more than any other city): besides Korotkevich, Andrey Lopatin and Nikolay Durov from St. Petersburg State University and Evgeny Kapun, Mikhail Kever and Niyaz Nigmatullin from ITMO. There are also more than twenty one-time world champions.

Do we know much about these lads? Do we often see them on TV? After all, they, unlike the familiar characters on the box, are our national elite. Some people may have heard that Lopatin

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and Durov were the main developers of the VKontakte social network, one of the fastest in the world. Or that Alexander Shtuchkin, Evgeny Yuzhakov and Timofey Borodin, graduates of ITMO who have been successful in programming championships, founded Skartel, the company where the world's first WiMax communicator was developed... This generation will fight for the country's technological independence in tomorrow's digital world.

Generally speaking, many areas of the Russian economy are stagnating, but the software industry is growing year by year. Innovations in the IT field are going through the roof. The major Internet companies Yandex and the Mail.Ru Group were founded from scratch, without state support, with capital on the level of the Magnit chain of shops (but in the buying and selling sphere the share of intellect will be less). The major Russian raw materials companies are the result of the division of the Soviet legacy — nobody has started such a company from scratch in the last twenty years. So who is our national treasure?

If we compare the ITMO dynasty with Barcelona and their perennial rivals from St. Petersburg State University with Real Madrid, then Gena Korotkevich is undoubtedly the Messi of computing, scoring himself and generously supplying passes to his teammates. It is an appropriate comparison, because the boy from Gomel played a great deal of football, not only in games lessons at school. So he is a programmer, a mathematician and a player, but by no means a botanist.

CONVERSATIONS AT ITMO — BEGINNING

We met again a few days later, this time in the vestibule at ITMO. The Legendary Grand Master was wearing a light-coloured jacket with the inscription There are many ways to have fun. For Gennady programming is fun.





In the corner of a room filled with desks we chanced upon a kind of ritual: three lads from the ITMO first team, who were to become world champions in 2017, were preparing for the event in South Dakota (USA) in a tough regime simulating competition conditions. Vladimir Smykalov, studying for a master's degree, and 4th-year students Ilya Zban and Ivan Belonogov exchanged cursory comments with Korotkevich and said hello to us, but they did not want to take their eyes off the computer even during the photograph session.

He brought the jacket back from the new Japanese AtCoder platform, to which he was invited last November. These competitions in Japan had been held previously, but the platform is now open to all-comers and Gena thought 'why not?'. It was said in a humdrum way, like: I was just passing, but go on, I think I'll play. In this first historic final the ITMO student won and received a prize of \$5,000, but the money was not the most important thing, as long as it was fun.

A large photograph hangs in the vestibule: Gennady Korotkevich and Niyaz Nigmatullin with a cheque for a million or so roubles for their victory in the prestigious VK Cup. The winners were not particularly impressed by the sum, as is obvious from their faces: programming in pairs is fun.

We passed through the Computer Technology Department, the hotbed of champions. This inner sanctum is actually a suite of rooms and partitions crammed with computers and a Brownian motion of young people, one of whom was showing schoolchildren around. Others were sitting on their own or in small groups at a computer, their eyes glued to the monitor and their fingers to the keyboard, not noticing anything that was going on around them. Someone came to work and left in a hurry shortly afterwards — he obviously had other things to do. It was not immediately clear whether they were training, preparing courses or assessing the results of scientific research.

The department, to put it in newspaper speak, is a conveyor belt for training highly-qualified young programmers as part of the educational process. Its three main elements are working with promising schoolchildren, holding sessions with students on a special educational programme and taking into account graduates' individual preferences, creating the conditions for self-fulfilment. The secret of the production of personnel is actually that some of the champions and prize-winners at olympiads remain in the department after graduation, declining offers from large

corporations — the creative environment and the opportunity to pursue their beloved occupation and remain in contact with friends are their priorities.

It goes without saying that ITMO does all it can to ensure that champion programmers like Korotkevich guarantee a succession of generations — so that, in the words of Professor Shalyto, they remember the sowing when they bring in the golden harvest. A wealth of opportunities, as colourful as a peacock's tail, opens up before graduates. They can study science — the department has four laboratories, including an international one, with adequate funding. Now ITMO is 56th in the Times Higher Education ratings for Computer Science, i.e. it has reached the top hundred higher education institutions ahead of time — long before 2020, as prescribed in the presidential programme 5-100. '56 is a good number — I went to High School No. 56 in Gomel', smiled Gennady.

Other options are teaching or working as a trainer, with the example of Andrey Stankevich before them. 'There are several clubs for schoolchildren. I don't run any of them, but it's great that lads from the champion teams teach in them — they can teach them a lot', says Gena.

His classmates from his student days often go into business, start their own companies or join established ones, but ideally they combine work in the department with projects on the IT market. Of course there are also those who climb the social ladder to enviable jobs outside the university, the city and even the country. For Gennady, who is on the radar of top companies, this prospect is more than real. 'I think if I had been made an offer I couldn't refuse I would already have accepted it. Obviously I am resistant', he grinned in his unruffled way. Is he not tempted by the opportunity to move to one of the world's capitals? 'I don't have a dream city where I would want to live. I like St. Petersburg and don't regret coming here.'

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There was no way of getting this IT sphinx to talk frankly, but in the back of my mind I realized: the *tourist* had clearly explained that he was currently at a crossroads — the world is changing and so are his preferences: right now he has not committed himself to anything to the extent that he can talk about it, but he is keeping all his options open.

He spoke much more readily about his department than about himself: there are ‘great teachers, but it is difficult to learn, even very difficult. Students often transfer to easier specialities. And those who don’t have the time or cannot assimilate the material can catch up during the sessional exams.’ Even he had to catch up: he sat the winter exams ahead of time, went home for the holidays, then sat the last exam of the session on his return. No allowances are made for champions — everyone is treated equally. After all, the essence of studying is not to just to pass or fail. It is possible to

postpone a test for a valid reason (competitions, training sessions): knowledge is rated on a points system similar to that in the West, with a compulsory exam at the end of term. But most importantly, in Korotkevich’s opinion, there are people in the department with experience of taking part in school and student competitions — it is just that some learn and others teach, understanding the motivation and psychology of champions. A comfortable environment is created for them: the schedule even allows for evening training sessions.

Taking a deep breath I asked him a standard question: ‘What is your normal day at university like when you are not at competitions?’ and got a totally evasive reply: ‘My days are very different. At this stage of my life I have a fairly flexible schedule.’ Surprisingly these became key words: a flexible schedule combined with inner freedom as a prerequisite for a conscious choice of career.

Poster in the vestibule of ITMO. The victories of its student programmers at Russian and international competitions has already become part of the university’s brand.

Left: Bachelor and master’s degree students of the Department of Computer Technology. 2017.



The *tourist* plans his route.

Andrey Stankevich with yet another gifted programmer.

The *tourist* is not an ideal student, as confirmed by Andrey Stankevich — not only a great trainer and organizer of olympiads, but also a lecturer in such refined disciplines as discrete mathematics, algorithms and the structure of data, functional language theory, methods of transmission and — no joke — complexity theory. He is also Gennady’s supervisor in his bachelor’s degree work on combinatorics, which has proved to be very interesting (how could it be otherwise?): ‘The lads in the current ITMO 1st team, Ilya Zban and Ivan Belonogov, like solving the most difficult, semi-research problems which I set on my courses as facultative homework. Gena wasn’t one of the particularly inquisitive ones — he had enough difficult problems to solve at olympiads, but he coped with the educational programme in full, simply because he thinks well. That is why he receives an increased grant, along with a personal one from Oleg Tinkov.’

However, these grants too are not bound by special circumstances.

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CONVERSATIONS AT ITMO — CONCLUSION

When I visited the department again in autumn it was even more crowded. Vladimir Parfonov, the Dean of the Faculty, explained why: with only 120 budgetary places available they accepted 190 victors and prize-winners of school olympiads. Rector Vladimir Vasiliev, who is also Head of Department, thought it unreasonable to squander this seed material. They also took thirteen contract students who had achieved high marks in the Unified State Examinations. Another 68 Olympians were accepted in their specialization — information systems. In total there were twice as many young people than in the previous year! The Dean has mixed feelings about this new reality — half delight and half anxiety, as the lecturers’ load has increased sharply: ‘It’s good that the lecture for the intake will be given by the cult figure of Stanok (Assistant Professor Stankevich), but who will take the practical lessons for ten groups? All these graduates of physics and maths

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Left:

'Will somebody help us or does everyone only want to take them away?' Professor Anatoly Shalyto convincing businessman Oleg Tinkov to give a personal grant to talented students at ITMO. He was convinced!

Sometimes they return. The Dean, Vladimir Parfionov (right), told me an amazing story: Niyaz Nigmatullin, a two-time world champion, decided to leave his prestigious job with a respectable company to become part of the full-time teaching staff. They told him: 'You're mad — in a year you'll lose enough money to buy a car'. 'Never mind, it's more interesting here'.

schools listen carefully to the teacher, because sometimes they know more than he does and do not forgive any weakness. We have been rescued by our senior students, past victors and prize-winners at student olympiads who are now postgraduates — they have agreed to do some teaching. They can answer any question and there is no generation gap with the students. A cloud of young people devoted to high technologies of programming has formed around the department. We are creating the country's IT elite and that is our mission.'

As a true futurologist Parfionov went on to paint a scenario for the coming decades, when the fight for leadership in developing systems of artificial intellect (the future ruler of the world) will be waged by the elite of nations, just as it was with the atomic and hydrogen bombs. Only the USA, Russia and China meet the three basic conditions of technology superiority in this field: a large population, progressive companies who can provide attractive jobs for high-class programmers (otherwise they will go abroad)

and the technologies for the formation of an elite. These countries' approach to the creation of an elite differ, however: Russia and China begin the identification, selection and training of gifted youngsters while they are still at school, whereas the Americans recruit them from all over the world when they start university or when they graduate.

In the developing computer revolution we have staked our future on the concentration of resources, including human capital. If we concentrate the flower of the nation in a few profile colleges, it will be easier and more effective for Russian IT companies to work with them. Two national research universities, the Higher School of Economics and ITMO, have detected this trend. According to Parfionov, about 60% of talented children are concentrated in them. What is more, unlike classic universities they have a noticeably greater proportion of young, professional and mobile teachers (the people in that cloud). And the HSE, needless to say, does not have such a forge of champions as ITMO.

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The concentration of world champions at ITMO is going through the roof. As two-time champion Gennady Korotkevich says, 'they are coming in herds'.



Pavel Mavrin, world champion in 2004 and now on the department's staff, wrote about this photograph on Twitter: 'The crowd of first-year students in the Department of Computer Technology 2017. At this rate they soon won't fit into the assembly hall'.



At the department schoolchildren are monitored even more closely than the students. It is a matter of demography: in each year of birth in Russia approximately 500 school-leavers (out of 1,000) are inclined towards programming, but Russian IT companies need many times more new employees than that. Where else can talented material be found than at school olympiads in information science and mathematics? Andrey Stankevich, a unique prospector for programming gold, has held dozens.

But here too Gennady is a special case. Stankevich instantly found the information in his laptop: at the All-Russian Open Schools Olympiad in 2010 the team from Gomel in Belarus which included Gena Korotkevich solved all eleven problems in 4 hours 20 minutes, whereas their counterparts from Moscow and St. Petersburg took 7 hours. Impressive? After that came the International Schools Olympiad, at which the twelve year-old won the gold medal. How could he not come to notice and, having come to noticed, be invited to ITMO?

Gena's parents are also special people. His father Vladimir, who recommended his son to choose ITMO, reasoned as a professional: it was a compact university orientated towards training in informatics and competitive programming, in particular the ACM ICPC. Large universities also offer this, but usually only as an extracurricular activity. Apart from that, if you enter a university (large or not very large) you study in your own department and in your own group. In this sense studying in a computer technology department and in a group consisting of Olympians honed to the search for new knowledge was the initial priority. Incidentally, the department's intake in that year was only 60 students... Gena certainly did not make the wrong choice: he has won a lot of tournaments, completed his master's degree and, most importantly, has found his own milieu.

He sensed he was the subject of particular attention from his first days at ITMO. This procedure is called immersing a

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school-leaver into the context of student competitions, in which everything is already on an adult level: problems of higher mathematics, theories of probability, statistics and mathematical analysis. These disciplines are not in the school curriculum, so even young champions and prize-winners at international school olympiads often lose themselves and drown in the maelstrom of student battles.

The search for a team chemistry led to the outstanding newcomer Korotkevich's inclusion in the ITMO's first team with the 2012 world champions Mikhail Kever and Niyaz Nigmatullin. Even after the first short session it was evident that nobody could introduce the first-year student to the subject better than these lads. Niyaz recalls that they trained intensively two or three times a week, shared with Gena the 'little knowledge' necessary for solving problems and occupied themselves with developing communication skills ('Team programming is unthinkable without communication,' he said, quoting one of the classic exponents of the genre) and also learned from him ('He's very clever'). In this way harmony was achieved.

Gena, who was initially prepared for a lengthy period of adaptation so as not to let the team down or spoil his CV, agreed to make his debut at the ACM ICPC in his first year, and naturally did not regret it.

In forming the champion team in 2015 Stankevich and his colleagues decided on a different chemistry. They chose teammates to accompany Korotkevich as leader who had competed sufficiently among themselves and were capable of helping him in non-standard situations. At the traditional summer training session in Petrozavodsk they found the optimal combination: Artyom Vasiliev and Boris Minaev, who had already competed together successfully, winning the bronze medals at the previous World Championship. It turned out to be a good choice: Morocco, where that year's championship was held, is an exotic country — Gena



He could have repeated the words of a character in the serial 'The Meeting Place Cannot be Changed': 'Hang on. I haven't decided anything yet'.

2015 world champions Artyom Vasiliev, Boris Minaev and Gennady Korotkevich with the trophies in their university.



The 2015 world champions were received at Smolny by Governor Georgy Poltavchenko.

did not feel well in Marrakech, but would not submit. According to the competitors and trainer, this is how it turned out. The ideal strategy for a competition marathon is not to get stuck at the start but to solve the problems in ascending degree of difficulty — for this it is preferable to sort them out immediately and solve the relatively easy ones first. The team leader dealt with the initial problems. Meanwhile, Artyom and Boris held the fort until Gena was up to speed and started to dominate as usual. As a result the ITMO team was the only one to solve all thirteen problems (eight of them by Korotkevich).

In passing, it turned out that there was no intrigue surrounding his absence from the ACM ICPC in 2014 as I had thought.

‘Gena is an outstanding competitor’, explained Stankevich, ‘but we have many strong competitors who have been training for a

long time. We gave him the chance to recharge his batteries and feel at home in the university, keeping him in reserve for the following year — with his agreement, of course. In our Olympic Training Centre every competitor, especially the top ones, has a say. Some are training with the aim of competing at the next final, others for future competitions. The success in 2015 confirmed that we made the right decision in 2014.’

The trainer explained with similar logic why Gena is so definite about the continuation of his career. We have to accept this explanation, particularly as it is shared by Korotkevich’s circle of close friends. He is now close to finishing the star-studded university stage of his life and as a proud person is seeking a suitable means of self-realization. The olympiads were his Olympus and it is always hard to come down from Olympus to begin the ascent once more, even with the bonuses of medals, cups and high ratings. Any project he turns his hand to will be good and whatever occupation he may choose he will not vanish and we will certainly hear more of him. Personally I would add: the characteristic of an all-rounder is to be at home in any place — it is only necessary that it is a place that appeals to him.

Naturally he is still in the cloud, in the race or, as the saying now is, on the scene. He flew to South Dakota for the 2017 final as a member of the team of ICPC-Live, sponsor of the transmission of the World Championship on the Internet. In addition, YouTube viewers were able to see how the trio of programming monsters — Korotkevich, Pyotr Mitrichev from Moscow State University and Mikhail Tikhomirov from the Moscow Physical-Technical Institute — solved the problems the tournament competitors were set in real time and completed them quicker than the champions! For them it was just fun.

Artyom Vasiliev, who did not go to the championship, said that he kept switching between the two transmissions. He has a friendly reverence for his roommate.

Investment in Intellect

As an adviser to the World Programming Champions School which has recently been established at the ITMO (another element of a comfortable environment) Gennady met a delegation of Chinese students and gave them a lesson. When I said I had heard he had many fans in China and India, he tactfully corrected me: 'I don't know, perhaps it's because there are more people there.' And the latest news is that the champion has started holding a practical lesson in Algorithms and Structures of Data for the department's first-year students. He agreed to do this at the request of Niyaz Nigmatullin, who as a postgraduate in the department lectures to one group of the new intake in that discipline. Korotkevich took the other group and, to Niyaz's delight, has a responsible attitude to teaching the first-year students.

Of course this is no guarantee that Gennady will remain at ITMO on completion of his studies. Lidia Perovskaya, a tutor in the department whom I met after lessons, does not exclude the possibility that he might go to somewhere like Bali or Thailand and work remotely. On the other hand, why not? He is a free spirit with a flexible schedule. After finishing our conversation, Lidia glanced at her gadget: 'Several online tournaments are now in progress at the same time and Gena is probably competing in one of them.' The evening had immediately ceased to be languid.

A final brushstroke to the portrait of our hero: when Barcelona mounted their fantastic comeback against Paris Saint-Germain in the Champions League, trouncing them 6 : 1 (after losing the first leg in Paris 0 : 4), Professor texted the Leo Messi of computing: 'Barcelona won in your style. Class!' Indeed, Barça had scored three goals in the last seven minutes, including added time — reminiscent of the time allowed for solving problems at the ACM ICPC. In his texted reply Gena pedantically stressed: 'Even away from home I never lose 0 : 4 ☺'. The professor finished the correspondence: 'That means you're better than Barça.'

And so it has proved.

Have fun!

