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#2 July 2014

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want Zuckerberg
and Brin to live longer**

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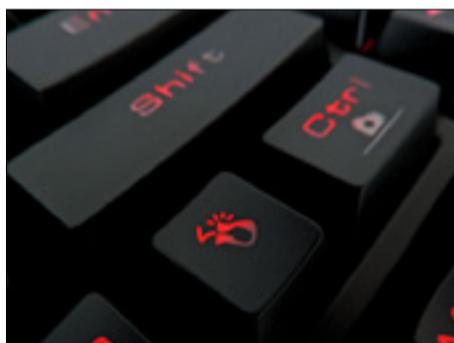
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Alex Zhavoronkov, PhD

Aging experts want Zuckerberg and Brin to live longer

By Danila Matveev, PhD

Back in 2003 I interviewed Alex Zhavoronkov, a long-term friend who held a senior position at ATI Technologies and who told me that he is planning to resign to go back to graduate school to study aging. In 2005 he resigned and in 2006 wrote an article for Upgrade titled "Transhumanism and the perspectives for life extension". When he said that Big Data is one of the keys to curing aging, I did not take him seriously. But now I can see a wave of companies entering the field and it makes me wonder if the revolution in aging has begun.

Google declares a war on aging

In September 2013 Google made headlines by announcing Calico, a Google Ventures-backed company with the mission to fight aging and eradicate aging-related diseases. In the letter to the shareholders in a press release on his Google+ page (<https://plus.google.com/+LarryPage/posts/Lh8SKC6sED1>) Google co-founder Larry Page said «And while this is clearly a longer-term bet, we believe we can make good progress within reasonable timescales with the right goals and the right people». And Tim Cook, CEO of Apple publicly commented and expressed his excitement about this new project. Google Ventures lead the first round of financing. The company made big news and even got onto the cover of Time with a question "Can Google Solve Death?". In six months that followed Calico made one meaningful press release announcing that it hired several scientists including the genetics of aging veteran Cynthia Kenyon and several ex-Genentec people. The company CEO is Arthur Levinson, ex-CEO of Genentech a seasoned pharmaceutical executive, who also sits on the Apple board of directors. Calico is a very cryptic company with no publications and strategy announcements.



And in March 2014 there were two similar announcements: Human Longevity Inc and In Silico Medicine Inc launched in the US. Human Longevity Inc, which got \$70 million from private investors, is lead by Craig Venter, who famously competed with the US government in a race to sequence the Human Genome and Peter Diamandis, the founder of the X-Prize. The goal of the company is to sequence a large number of genomes (40,000 people to start with) and microbiomes (sequence of all of the bacteria in the body) to search for clues to healthy aging and find solutions to help people be more productive in the course of aging.

InSilicoMedicineisrunbyDr.Zhavoronkov and got funding from Deep Knowledge Ventures and Pathway Pharmaceuticals in Hong Kong. It is located on the premises of the Johns Hopkins University and supported by the Emerging Technology Centers of Baltimore. The company published its methods and strategy in research papers, some in Frontiers in Genetics and other famous journals. They take the gene expression data (imagine that each gene in the genome is an object, gene expression is how many instances of this object are initialized at one given moment; all of the instances of all genes all genes is called the transcriptome) and

many other data points from “young» and from “old” tissues and then run simulations on large databases of drugs to see what drugs can return the “old” cell into the “young” state. They do a lot of other things, but it is better to just go onto their website and take a look.

All of these companies use different methods to solve aging and it is hard to tell which strategy is the best. But if even one of them succeeds, we will be able to live longer. And the longer we live, the longer we have to wait for other new solutions to extend our lives even further.



IN SILICO MEDICINE

Computer scientists are most active in longevity

But weather or not the revolution in aging will result in any tangible results, it is

clearly led by the IT guys. This is probably because the IT guys are used to constant change and they need to constantly look into the future and reinvent their businesses and themselves. They are not afraid to venture into the new territories and are quick to recognize trends. I did some digging and it looks like one of the most famous yet biogerontologists, Dr. Augrey de Grey, did his undergraduate and graduate degrees in computer sciences. His research is supported by Peter Thiel, the co-founder of PayPal and founder of Clarium Capital, which invested in both LinkedIn, Facebook and many other technology companies, Jason Hope, who heads a large mobile app development company and many other technology entrepreneurs. Larry Ellison, the founder of Oracle is funding the whole institute dedicated to aging research. And there are many others. In May this year NYU professor Dr. Bud Mishra, one of the famous computer scientists in the field of robotics, data mining, search and oncology announced that he will be focusing on aging research and joining the science advisory board of InSilico Medicine together with the former director of the Human Genome Project, Dr. Charles Cantor.

The convergence of information technology and biotechnology

The emergence of mobile health tracking technology with gadgets like Fitbit, Nike Fuelband, Basis B1 and even the new generation of Apple and Samsung phones and convergence with genetic and molecular diagnostics technologies like 23andMe (founded by the ex-wife of Sergey Brin), will inevitably lead to more and more IT guys joining the biomedical revolution. And this is another service offered by the In Silico Medicine called Personalized Science. For the new breed of high-tech entrepreneurs and philanthropists that are not only interested in supporting biomedical research, but also actively engaging in it, they form teams comprised of the young scientists, medical doctors and programmers that work with the wealthy entrepreneur on a research project involving his/her body and there are already several success stories where such projects turned into working businesses, analytical companies and even high-tech biomedical venture funds.

The army and cyber security companies also join the game

While I was writing this, I found the very recent press release by the Defense

Advanced Research Projects Agency (DARPA), which announced the launch of the “Big Mechanism” program, which will use advanced data mining techniques to go through millions of scientific publications to construct very data-rich biological signaling pathways to help understand cancer. This will be good news for InSilico Medicine, which analyzes these pathways to predict the efficacy of various drugs. And Paul Cohen, the program’s director will speak at the “Preparing for an Aging World: Living Past 100” in Arizona in April. So it is possible that DARPA has the agenda to fight aging. Paul Cohen is a computer scientist, which strengthens my hypothesis that it will be the IT guys, who will defeat aging.

Interview with Dr. Alex Zhavoronkov



1. Since your last meeting you have been all over the place. Bestselling books, a doctorate, charitable foundations, new laboratories and now InSilico Medicine. Do you have any regrets leaving ATI Technologies?

ATI gave me a much broader perspective on the many possible uses of computer graphics and memory and the resources to pursue my dream. I don't think that there is anything more important than finding new ways to truly save people's lives instead of marginally extending them. My only regret was that I did not do it much earlier. I had to explore the many areas of aging research before developing an understanding and mental roadmap of what is likely and possible and stumbling on the concept that may help accelerate the discovery of some of the life-extending drugs and therapies and bringing them into clinical practice. On a side note, I prefer to use emerging technologies or technology evolution rather than the term “transhumanism”.

2. Are there many IT people shifting their focus into aging research?

There are many. Dr. Aubrey de Grey, one of the most famous names in aging

research, who was the first to propose a comprehensive model for combating aging, was originally trained as a computer scientist. Computer scientists usually have a wider imagination and passion for innovation than any other professional group. And those, who look at what is the major problem in human life that can be solved with technology quickly realize that it is aging. The beauty of the complexity of aging is that many people involved in the areas that seem to be far removed from aging research do not realize that they are effectively contributing to increases in productive longevity. For example, engineers developing sensors and mobile applications that track your health status may contribute more years to your lifespan than scientists studying the effects of diet and exercise on longevity and proudly call themselves aging researchers. So if you are in IT, you do not need to necessarily drop whatever you are doing and go back to school, but instead refocus the current activities to make the maximum impact and jump on the bandwagon of the aging revolution.

3. What are the main trends that you see emerging in information technology with application to healthcare?

The general trend that you can see almost everywhere is convergence of technologies. Information technology is quickly merging with the healthcare and biomedicine quickly blurring the lines. Genetics, molecular diagnostics, imaging, patient data management and many other fields are now more dependent on computer scientists than on biomedical researchers.

Another general trend is the acceleration of progress. To the folks, who saw the processor clock speeds jump from kilohertz to gigahertz frequencies in under a decade and witnessed the birth of the Internet and mobile technology, the progress may seem to have slowed down. But nothing can be further from the truth. Many areas of technology are advancing exponentially and we will soon see advances in mobile healthcare technology, biometrics, Big Data analysis, molecular diagnostics, decision making in medicine and many other fields.

The convergence of mobile technology, wearable computing, advanced biosensors and Big Data analysis, will soon provide us with tools that help us monitor our health, activity, reduce risks, identify and treat diseases before they

cause problems. And people, who realize this trend will make huge impact on the future of health and make a lot of money, because while it is almost impossible to compete with Apple, Google, Samsung and in the near future most likely Facebook, on new phones, tablets and laptops, it is possible to come up with the new ideas for biosensors, mobile health and wearable technology, which can be integrated into their ecosystems. We have all heard about Fitbit, Jawbone and Nike devices, but there is a wave of other mobile biotracking devices that are entering the market. In late 2012 I bought a watch, which integrated an activity tracker with a heart monitor and measured temperature and precipitation from a small startup called Basis. And two months ago, in early 2014 they were acquired by Intel. I have no doubt that soon we will see either subcutaneous, minimally- or even non-invasive devices measuring glucose, hormones, cell free nucleic acids and the whole myriad of biomarkers and either signal or even correct the problems before they cause significant damage.

4. You seem to be engaged in too many projects that we can discuss here. What

is your most promising and exciting project?

One major difference between IT and biomedical research is that in IT the time it takes for a discovery to reach the mass market is relatively short. It can take months of just a few years. But in most areas of biomedicine it may take decades for a drug or technology to get into clinic. If you find a completely new drug that triples lifespan in mice today, it may take a decade or more before it goes through clinical trials and regulators allow it to be used to treat some disease. It will not be prescribed as a preventative drug. And the regulations are so strict nowadays that if Aspirin was discovered today, we would not have been able to buy it over the counter.

So the two of the most interesting projects I am involved in are the International Aging Research Portfolio (IARP) and InSilico Medicine, Inc. IARP helps analyze the research projects at the level of government grants and publications, way before they reach the market. Several analytical agencies started using this resource to apply machine learning techniques to build dynamic roadmaps for aging research.

InSilico Medicine is a company, which develops algorithms to screen through the thousands of drugs that are already known and predict their effectiveness as geroprotectors, drugs that either slow down the aging processes or repair the age-related damage. This same technology may be used to personalize drug combinations for individual patients. I prioritized this project among all others because it may at the same time provide clues to what can I do today to slow down aging and help build the platform for helping many other research teams to come up with the revolutionary new ways to combat aging. It is also the perfect amalgamation of IT and biotechnology encompassing Big Data analysis, bioinformatics, biomathematics, genetics, epigenetics, drug database management and machine learning. We don't want it to be just another research project and would like to start churning out practical results before the end of this year.

5. Is there any evidence that it may be possible to discover working solutions for aging within our lifetime?

Scientists already made flies to live seven times longer and worms ten times longer than normal. And if we extrapolate the

results in mice to humans, we can already live past 150.

When I started monitoring the field, there was just a dozen good books on the biology of aging, most of which are nowadays outdated, and today there are thousands. China and India started actively contributing to the academic advancement in biomedicine and there are more scientists entering the area than ever before.

Unfortunately, I cannot show you a 120-year old person, who lived to that age on a combination of drugs or demonstrate dramatic before and after rejuvenation cases. But there are a lot of clues that these discoveries are within our reach.

6. So when are we going to see discoveries that will help us live longer?

There are already technologies and drugs that extend human lifespans, we just need the new tools to prove it. Humans live much longer than flies, worms and mice and to conclusively say that something works or does not work requires many decades and sets of markers that can be measured dynamically. For example, Aspirin was discovered entered the clinical practice over a century ago and Metformin was discovered almost a century ago. But only

recently these drugs were reported to have onco- and gero-protective properties. And in the case of both drugs we do not fully understand all of their targets and mechanisms of action. It took over three decades to prove that caloric restriction extends life in monkeys and there is still a lot of debate among scientists around the data in these experiments.

On the other hand, many diseases of aging are now effectively treated when diagnosed early. Cancer is no longer a death sentence, but just another common diagnosis and survival rates are soaring. We don't know how many years will the mobile heart monitors, activity trackers, driverless cars, advances in robotics and computer-assisted diagnosis and decision making add to our lives.

To answer your question, the future is already here and unless something dramatic happens, we will be living longer anyway. And the really powerful advances are just around the corner.

7. What do you think is the theoretical limit of human life?

The answer depends on your definition of human life. Some of the advances that will extend our lives will also enhance our abilities and possibly transform us.

In theory, the longer you live, the more time you have to wait for advances that extend it even further, a phenomenon Augrey de Grey calls "the escape velocity".

8. Do you think any of the IT companies will be significant players in aging research?

I have no doubt that technology convergence will make every large IT conglomerate focus on healthcare and in turn on aging. IBM is already developing an intelligent system capable of diagnosing disease and making medical treatment decisions called Watson. They already started marketing it and investing in developing an ecosystem. IBM is already a big player in imaging, software systems and medical technology, but at present, Watson may be the most valuable and promising single asset they have.

Samsung is also a big player in medical equipment with many research groups focusing entirely on healthcare research. If you go to any notable conference nowadays you will meet someone from Samsung either presenting or most often scouting. In the mobile space they already unveiled their Galaxy Gears heart monitor and started deploying many other mobile health solutions.

Both Apple and Google already contribute more to biomedicine than you know. There are thousands of apps using their technology ranging from detecting melanoma to tracking your heart rate using your phone's camera. Google Scholar is slowly replacing Pubmed when it comes to searching for research publications. Google started focusing on genetics. There are rumors that both Apple and Google already had meetings with the FDA to discuss some of their projects. There is a lot of hope that Apple's new iWatch and iPhone combo will integrate advanced biosensors with real healthcare applications.

Established IT companies that are not looking seriously at applying their strengths in healthcare and biomedicine will certainly miss out on the greatest opportunity in human history.

9. If any of our readers want to switch from IT into aging research what would you recommend? What advice would you give to others in our industry?

Recall the wild rides in personal computing in the 80s, Internet in the 90s, mobile and social in the 00s? You haven't seen anything yet! The convergence of IT and biomedicine will eclipse these

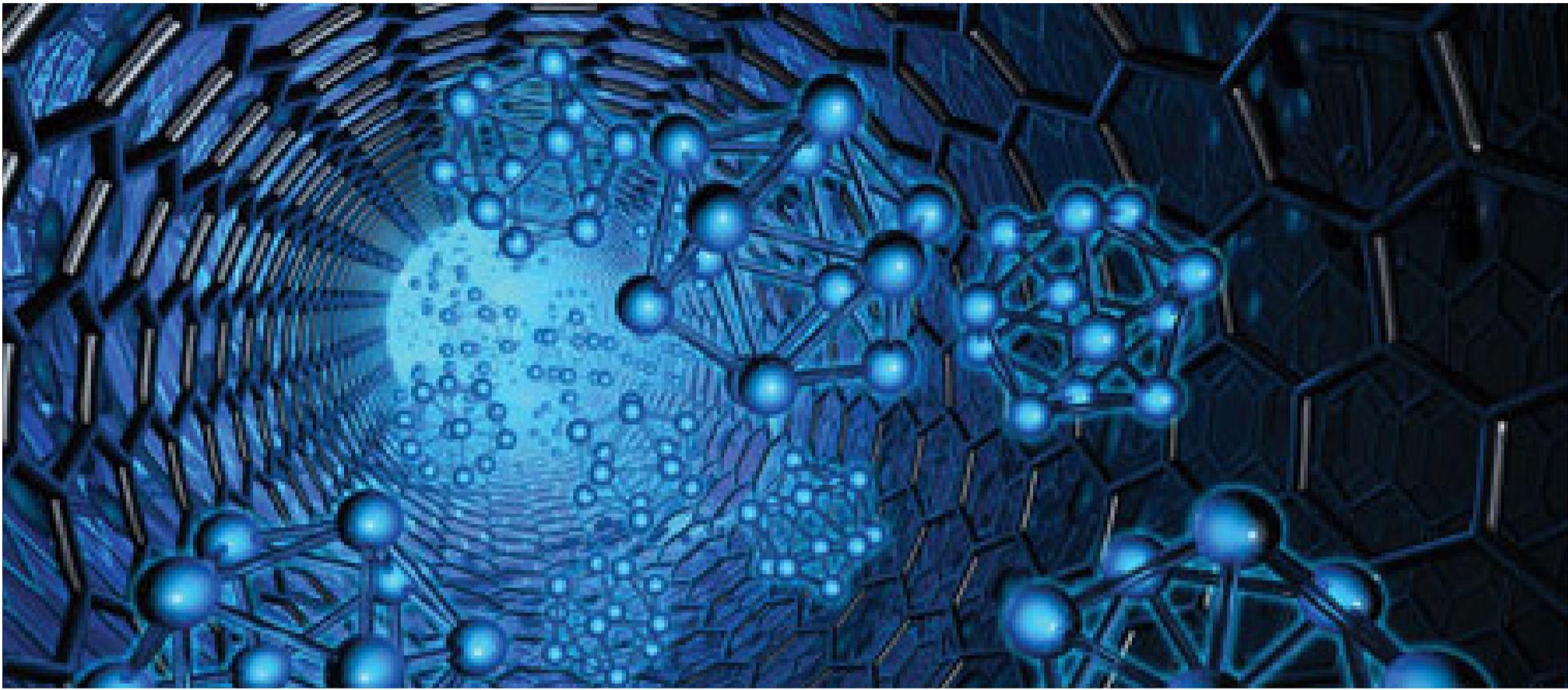
technology booms. And like with the prior three revolutions, if you are not prepared and not participating, you may miss out on something that is much more valuable than physical assets, reputation or influence – the ability to see your loved ones living extraordinarily healthy, long and productive lives.

My first recommendation is to embrace the possibility of significant life-extension and already plan your life as you had 120 years of productive longevity ahead of you. Thousands of scientists were working hard for the past three decades and their work will result in significant longevity dividend.

Before quitting your job and focusing entirely on aging research it is worthwhile taking courses in the relevant disciplines. Coursera, edX and many others offer excellent introductory courses into bioinformatics, genetics, biology and many related areas.

There are hundreds of conferences on aging and related areas every year and it is worthwhile to attend a few of these to get a perspective and understand the diverse range of projects and often conflicting views.

There are many organizations, where it is possible to volunteer your time in exchange



for the valuable knowledge and experience without quitting your job. The Biogerontology Research Foundation, where I am one of the directors, SENS Foundation and others are good places to start.

In cases where finances are of no concern and there is a fair amount of time to explore, it may be possible to organize personalized science projects, where a group of young scientists is supported and managed by an experienced IT executive. This group educates the IT executive and uses his/her biological materials in research projects.

It may be difficult to compress my recommendations in a short answer and I would like to take advantage of this chance to recommend my book "The Ageless Generation".

10. If you had the technology to make someone in our industry live longer, who would that be?

When life-extending technologies reach the stage of mass adoption the net present value of everyone's life will be similar and worth saving and I hope to live to that time of ubiquitous altruism and abundance. These technologies are likely to be available for everyone.

But in the unlikely scenario, where such technologies were available only for a select few, I think it would be fair if Sergey Brin, Larry Page and Mark Zuckerberg were among the first to get access because companies they built contribute more to the global progress and stability than any single person or government.

Samsung is developing standalone smart watch



As it was leaked to The Wall Street Journal Samsung is developing standalone Smart-Watch, in other words smart watch, which do not need smart phone, since it is smart phone in itself. Independent SIM, proprietary Samsung operational system Tizen, photo and video camera, GPS, Bluetooth, and heart beat monitor for state-of-art health and workouts monitoring. Although no additional details were provided, the smart communicator is expected to be presented to public at the end of June – beginning of July.

Let's see the battle of iOS, Android and Tizen...

Paralyzed Teen to Kick Off 2014 Soccer World Cup

The 20th Soccer World Cup in Brazil will be started this June from first kick off provided by paralyzed Brazilian teen (no name

was announced yet) with help of medical exoskeleton and special purpose hamlet receiving neurons signals to control movement. The exoskeleton system was created within the Walk Again project created by collaboration of Duke University, Colorado State University, Technical University of Munich and many others. Medical exoskeleton is unique system. Unlike to walking loader from Alien and other almost operational systems controlled by pressure of limbs this system is designed to help people with paralyzed limbs. Thus, the exoskeleton is able to read in human mind by means of multiple sensors of brain activity gathered in neuro-interface by soft elastic foam and 3D-printer.



Watch documentaries on Walk Again Project at: goo.gl/jS8KpI.

Gigabyte Ultraforce P35W v2 – the slimmest and lightest gaming laptop

It seems that days of large backpacks and pumped back muscles required to

play some hardcore shooter on plain-air are gone. Gigabyte unveiled the lightest 15.6» gaming laptop, called the 'Ultraforce' P35W v2. Measuring only 20.9 mm thin and weighing 2.16 kg, P35W v2 is powered by 4th-gen Intel Core i7 Processor and potent NVIDIA GeForce GTX 870M GDDR5 6 GB VRAM (scoring P7109 in 3DMark 11) delivering amazing gameplay and smooth-rendering of 3D graphics! The additional goodies comprise Gigabyte proprietary interface RAID Storm (3 mSATA SSD RAID 0) allowing using four hard drives and providing for hot swap; SSD with total of 2 Tb and two SSD of 512 Gb in RAID 0 plus two HDD by 1.5 Tb with total up to 4 Tb. In addition the keyboard has customizable lighting.



Read goo.gl/NpBjok for more, however no price was announced yet.

Acer XB280HK: 4K gaming monitor featuring G-Sync technology by NVIDIA

Acer has introduced the first 4K monitor that also features G-SYNC technology from NVIDIA. The Acer XB280HK is a 28"



TN display with 3840x2160 resolution. The major difference is that it features G-SYNC, allowing it to adaptively adjust its frame-rate to sync to the video card. As a result, if a complex scene causes the frame rate to drop the monitor will sync to this instead of introducing stuttering or tearing (at least devs are promising). In addition monitor is provided with some proprietary technologies like anti-glare coating ComfyView, power supply stabilization to prevent flickering - Flicker-less and automatic dimming - Low Dimming technology. Additionally monitor is provided with four USB 3.0 ports hub and support providing for 120° rotation and lift by 150 mm.

Considering viewing angle (170/170) the monitor will be based on TN matrix. Thus we recommend to wait for more detailed review to come out before rushing to shop!

Transcend JetDrive Lite – 64 – 128 Gb memory storage expansion card for Apple MacBook



It's worth noting that these are not merely memory cards but cartridges for hard drive expansion, since are plugged into SD and are not getting off the laptop. Moreover these cards are waterproof (please check waterproofness separately from laptop). Pay attention that JetDrive Lite is tailor made for each MacBook and Retina. Thus, when buying cartridge please check both model of laptop and year of manufacturing. (There is compatibility table on the manufacturer's site!)

Transcend JetDrive Lite is rather moderately priced: \$49 for 64 Gb to \$99 for 128 Gb. Plus lifetime manufacturer warranty.

EVGA TORQ X10 – gaming wired mouse with settings

EVGA introduced EVGA TORQ X10 gaming mouse for real hardcore gamers.

Mouse is wired and fit with Avago 9800 laser sensor providing up to 8200DPI with 1000Hz polling rate. The EVGA TORQ X10 features the highest quality Omron switches with a lifespan of over 20 million clicks. Gadget is provided with nine programmable buttons, adjustable weight of 147-160 g, built-in memory storing up to five user profiles, adjustable key travel (mouse may be shorter or longer to fit palm) and plugged lighting of metal bottom. To make it looks like UFO ...

Cable length is 183 cm. This model comprises two subtypes: \$50 (in pre-order, and will grow) made of plastic and \$70 of carbon.

Unfortunately does not know to cook.

Toshiba Tecra W50: business book with 4K resolution



Even though Toshiba already presented Tecra W50 model some year and a half, the

device was either unpopular, or did not deserved to be serial. In any way, vicious circle was closed and the business-book will see light of serial production. The only changes to the previous configuration comprised Ultra HD instead of Full HD and 15.6" IGZO matrix 3840 x 2160 of 282 ppi. The other properties are also nice: fourth generation of Intel Core i7, RAM up to 32 Gb, NVIDIA Quadro K2100M with 2 Gb GDDR5, two USB 3.0, one USB 2.0, lighted keyboard, and Ultra Durable body. The sockets allow gadgets batteries charging even when the laptop is off.. Price is rather big: starts from \$2,249. In other words it's good to be a businessman.

And yes, it has that staff between keys, how to call it properly...track point!

FSP USB-Charger Mini Wall Mount charging unit with stabilization and protection



FSP released charging device for telephones and gadgets - USB-Charger Mini

Wall Mount. Although this device is not sample of cutiness (almost every fifth charger has the same design) and current is rather mediocre: 1 A at 5 V, the appearances are deceptive. First of all Mini Wall Mount has really small dimensions: thickness of 1.5 cm. Then, this device provides real 1 A and 5 V at any current in the network (from 100 to 240 V). Additionally the device is fit with short-circuit, overload and overheating protections. So, even if lightning strikes the power grid, your gadgets remain alive and kicking. In general, it's rather useful device and we recommend buying it. It may be prices bit more expensive than ordinary no-name products (no price was announce yet), but there is no such thing as free lunch!

Money Yandex will help to pay your traffic penalties

It seems that Yandex has provided one more solution for driving person. It was times, when finding and paying traffic penalties were pain in ...

Being short, Money Yandex service was updated with button "Penalties". Clicking on this button user enters to indebtedness check, enters driver's license and car registration data (it's enough to enter these data only once, thereafter the system will

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- 2 **Мы покажем, какие штрафы нужно заплатить**
Используйте любую банковскую карту, Яндекс.Деньги или наличные.

keep this data) and receives payslips. After check system opens window with details on penalties. Thereafter the penalty can be paid using either Yandex pocket, payment card or go to the bank with payslip. Even though you will become poorer, but your life will be happier!

Cooler Master Quick Fire Rapid-i – ARM based mechanical mobile keyboard with backlit



Cooler Master started sales of high-end keyboard Quick Fire Rapid-i. The keyboard is mechanical and fit with 32-bit ARM-processor. The Keyboard is provided with five mode backlighting at five modes of brightness. Each keypress is correctly detected regardless of how many other keys are being pressed or held down at the time (NKRO technology). The keyboard with provided with rubber matt coating. Due to absence of digit block the Quick Fire Rapid-i is positioned as keyboard for mobile gamers and reporters (using it everywhere and every time). In other words, you can take the keyboard and free to go (cable will not get into your ways as it is detachable and may be placed in the pocket). Price of the goody in Europe is €105.



Acoustic system **Edifier S550 Encore**

Ivan Petrov
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Music: : Ruki Vverh

Striving for good sound quality is insidious and its treachery it can compete only with a photograph. Everything starts small: inexpensive technique, simple homemade gadgets, one or two cheap test devices. Further improvement rests on the need to buy something else, go somewhere to get a new experience or familiarity with the works of recognized masters in the area of interest. These small steps make ordinary inexperienced music lover into maniac obsessed with ideal sound...

«I think it's time to end up with large speakers, - I said to myself seen two huge boxes on the doorstep. Although I asked for high-end system by Edifier, the overall dimensions... Remember, you will not succeed placing these 5.1 using principle "out there, there is a small place to move PC and fit speaker". Only the global permutation and removal of unnecessary stuff will allow you in couple nights to fit locations for all elements. But it's worth it!

The set comprises six pieces: five satellites and one subwoofer, satellites weigh as much as the subs from economy systems, whereas sub weights as two weeks food reserves of an average family. «Weight is a sign of reliability» - used to say Boris the Blade (Boris the Bullet Dodger) in the Snatch by Guy Ritchie. Thus saying is applicable to this acoustic system. Expectations of amusement and fun for neighbors were growing with each satellite extracted from foam captivity. And when the subwoofer took its place under the table, malevolent grin stretched from ear to ear. The supply set comprises wires with strong and reliable connectors catering for all of the basic operations. While plugging the whole system I smeared with dust, but the grin of anticipation has not left the party. Some more bit, one

more connector to plug into PC and not to make it fall from stand... Cheers!

For the purposes of system customization, the device is provided with remote control housed on a stand with screen and cable connected to the subwoofer. Cable is long enough and reached the desk without any problems. Controls are intuitive and comfortable, the display is informative and provided with backlighting. Menu is simple and unsophisticated: twisted - pushed - yet twisted - once pushed. Practical skills of speed rotation and pushing are developed after first setting of S550.



In a addition to wired remote control the system is provided with wireless one, which instantly won my sympathy by its modest dimensions and low weight. I do not care for membrane buttons, plastic casing and screen absence. The control is convenient to be carried in the pocket, allow for blind using and protected against fall damage.



The lack of optical input was a surprise. I think addition of USB-socket with S550 identification as an external sound card would be absolutely logical. However

the manufacturer has decided otherwise, making system connection to the sound card output. I preserved all cables from sub (houses all electronic filling) to satellites as provided by the manufacturer.

The system has rather decent filling: powerful pulsed power supply, digital amplifiers D TAS5162 class controlled by eight channel audio processor TAS5508C. Subwoofer's body is made of high quality MDF board, which does not warp over time. Subwoofer has 10" sounder, long-exursion; assisted by two passive diffusers on the sides. The woofer is «swung» by two amps TAS5508C plugged in the bridge (each to its own coil, with two coils per dynamic). All this allows the subwoofer to regain well in the range of 35 to 130 Hz, the correct adjustment of the system components allowed to achieve smooth work, without sharp peaks and drops in the FRU.

Long sound adjustment has brought positive results, allowing using S550 for almost all genres: industrial, rock, classical, latin, electronic music, jazz - all are effortlessly, nice and natural. Even at high volume, there is feeling of considerable headroom. I mean, that time spent for allocation of the system components was not lost (though against audiophile canons, but I like it).



The bottom line experience of Edifier S550 Encore is positive. The developers' efforts are obvious. The system is fit with professional solutions tailored for the home use. Audiophiles film fans and fans to feel the exact positioning of the sound source will appreciate purity and brightness of a musical picture provided by S550 Encore. This system will be nice addition for home theater. Large wired control looks great next to the screen, and miniature and unpretentious remote easily fits into a small pocket. I think, that sound of this model will hardly leave anyone indifferent.

Device: Edifier S550 Encore acoustic system

Price: RUB 21,000

Signal/noise balance: 85 dBA

Inputs: AUX, CD, 5.1 cinches

Body: MDF

Tone correction: LF/HF

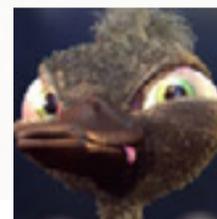
Controls: wireless/wired

Frequencies: satellites – 130-20,000 Hz, subwoofer – 42-140,000 Hz

Dimensions: satellites – 116 x 203 x 160 mm, central satellite – 316 x 117 x 157 mm, subwoofer – 367 x 397 x 489 mm

Weight (satellites/subwoofer): 12/19 kg

Details: edifier.ru



Video card **MSI R9 280 Gaming 3G**:
both solo and duet

Mazur
mazur363@mail.ru
Music: Groove Coverage

Last issue comprised article on various Radeon R9 290/290X, so it's high time for practical tests of 9th series cards. Although subject cards are referred to R9 series in fact the similarity of 280 and 290 is restricted to graphic process technology. The reference to the technical parameters table evidence for twinship of R9 280 and HD 7950 differing in frequencies only. However some fans managed to make reference HD 7950 operating at 950 MHz without voltage increase, not to mention some overclock versions by some companies.

Certainly AMD assures that graphic processor undergone some minor amendments, though from the user's point of view both 7950 and R9 280 are twins.

Things happen the product possesses rather high properties and is rather up-to-date, so there are no objections for its life cycle extension by renaming. Average consumer is addicted to marketing tricks like "change things every xx in yy years" and makes replacements without calling to the brain. Since the old was 7950, the new became 280, the parameters are rather good, and thus I need to buy it.

AMD graphic partners were pleased to have the new series of cards for free, the only thing they need to do is to change labels. The same was applicable to MSI R9

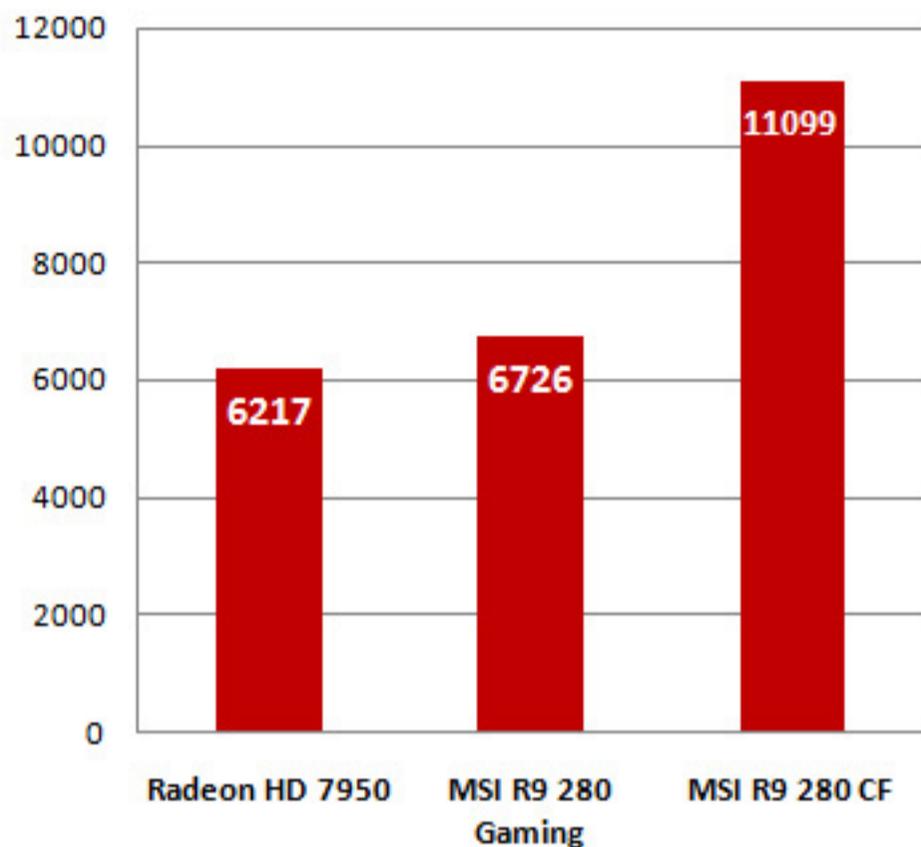
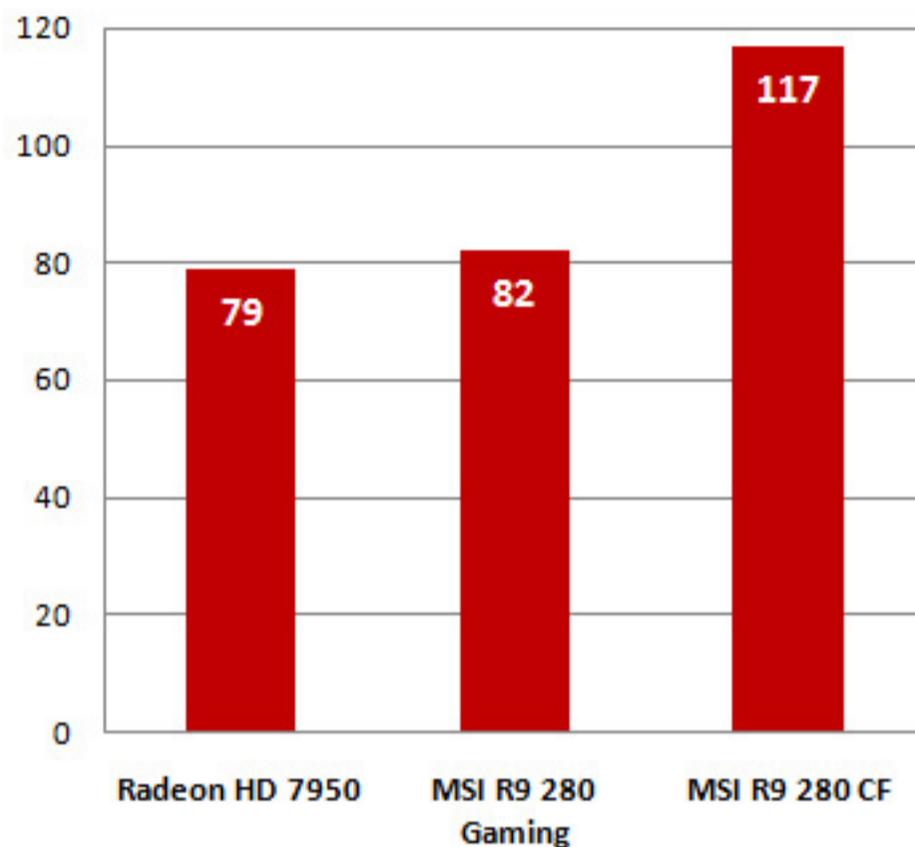
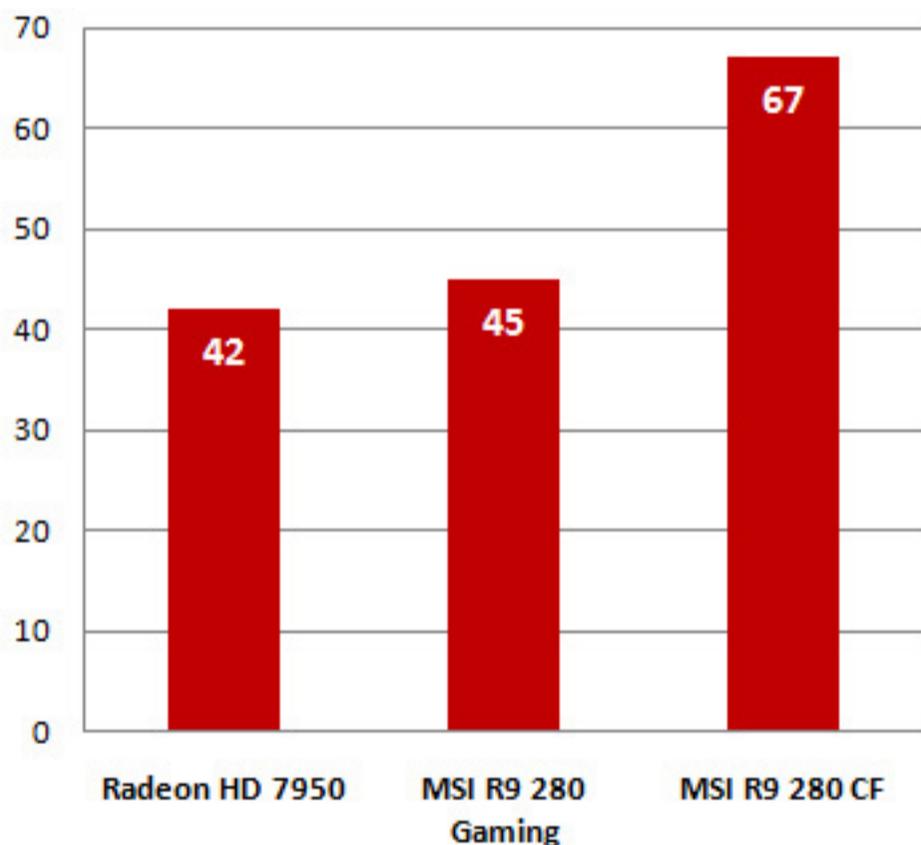
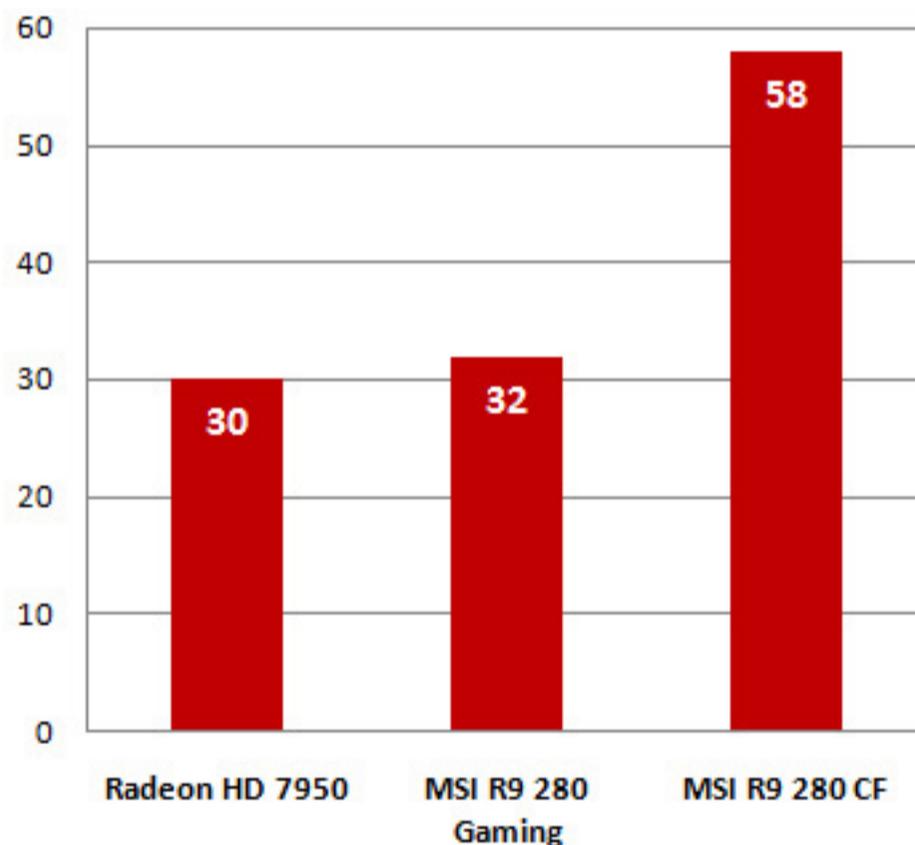
280, which is main theme of the review. When addressing to the manufacturers site, we can see gap in seven thousand series of video cards comprising all models except for 7970 and 7950. At closer consideration we can find out that one of the most wide spread versions of MSI R9 280X Gaming 3G is based on subject board Radeon HD 7970 with cooler Twin Frozr III, which was previously used for MSI HD 7970 Lightning.

Though selling the same model under different names is a lowly craft, thus MSI decided to revamp R9 280X Gaming 3G. Main changes touched chip: the reference one was replaced with proprietary designed chip in some way similar to Lightning-version of 7970. Tellingly, the



Table 1. **Video Card Specifications**

	Radeon R9 290	MSI R9 280 Gaming 3G	Radeon HD 7950
GPU (code name)	Hawaii	Tahiti	Tahiti
Transistors, mpl pcs	6200	4313	4313
Technical process, nm	28	28	28
Universal processors, pcs	2560	1792	1792
Texture blocks, pcs	160	112	112
ROP, pcs	64	32	32
GPU frequency, MHz	947	972	800
Memdory bus, bit	512	384	384
Video memory, Gb	4	3	3
Memory type	GDDR5	GDDR5	GDDR5
Memory frequency, MHz	1250 (5000)	1250 (5000)	1250 (5000)
Maximum TDP, W	250	200	200

3DMark 2013 Fire Strike**Battlefield 4****Mechwarrior Online****Metro Last Light**

cooler remained the same - Twin Frozr III. As a matter of fact, there are no reasons for cooler replacement, although some drawbacks Frozr III successfully cope with its task.

Reference chip is changed (in PCB) to amend layout for increase stability at higher frequencies, enhance power supply system, customize to proprietary or third party cooling systems. In subject

case the power supply system was known beforehand, instead of familiar converter CHiL CHL8228G, MSI used eight channel IR3563B and two channel uP1610P (for GPU and VRAM accordingly). Ten phases in a row made the board height grow up to 113 mm (126 mm with PCI-E socket). I did not notice any other changes. Since the same GPU remained in the center with 12 memory chips Hynix H5GQ2H24AFR for 256 Mb each placed around it.

Таблица 1. Технические характеристики видеокарт

Cooling system of "small things" like memory chips and power switches was change (due to change of PCB dimensions and location), whereas GPU cooler remained the same. Overall impressions are both positive and negative. I loved the developers' idea of using video memory radiator as force ribs making area of aluminum structure larger and relieving board of part of mechanical loads. Heat from the transducers power elements (in the tail of the board) is removed by separate radiator with small (4 mm high) edges. All radiators are screw fixed, which is also referred to advantages as being easy and safe.

GPU cooler is made simple and unsophisticated by the classical scheme "many

ribs, heat pipes, slim low-speed coolers of large diameter". The air passing through removes heat from the radiator of power subsystem and memory, providing for rather acceptable temperature of GPU of 80 °C. Coolers are almost noiseless, becoming audible when graphics processor is subjected to significant load. Noise of cooler working at full speed is louder, it even makes its way through the walls of the body, though maximum of 68 °C at GPU shall somehow neutralize the acoustic discomfort. As a matter of fact the cooler could have been less noisy if the ribs of radiator were placed in 2-2.2 mm rather than 1.2 mm, and after 2-2.2 mm, and the ribs area would not have been reduced due to long notches for fans. In such case the card would occupy all three slots (as DirectCU 2 on ASUS boards), but efficiency would have been much higher with lesser noise.

There is one caveat: the coolers of this type release heated air in all directions, and in case of poor body ventilation, the impeller drives warm air masses reducing the overall efficiency. The situation is exacerbated at card installation in CrossFire. Even if there is empty slot between the cards, the loaded GPU temperature may vary by 15-20 °C, since the "sandwiched"

card sucks back heated air. It is noteworthy that this measurement for duet of R9 280X Gaming 3G was performed at open bench, where cool air supply was not obstructed. Probably the closed body will require installation of additional fans.

The fixing clamp comprises traditional selection of sockets: DVI, HDMI, two mini DisplayPort. Upper part is decorated with the MSI logo, which is nice, but not practical, since the curly grille prevents the heated air removal.

Name	AMD Radeon R9 200 Series				
GPU	Tahiti	Revision	N/A		
Technology	28 nm	Die Size	352 mm ²		
Release Date	Jan 31, 2012	Transistors	4313M		
BIOS Version	015.044.000.005.000000 (113-XXX-XXX)				
Device ID	1002 - 679A	Subvendor	MSI (1462)		
ROPs/TMUs	32 / 112	Bus Interface	PCI-E 3.0x16 @ x16 1.1 ?		
Shaders	1792 Unified	DirectX Support	11.2 / SM5.0		
Pixel Fillrate	31.1 GPixel/s	Texture Fillrate	108.9 GTexel/s		
Memory Type	GDDR5 (Hynix)	Bus Width	384 Bit		
Memory Size	3072 MB	Bandwidth	240.0 GB/s		
Driver Version	atiumdag 14.200.0.0 (Catalyst 14.6) / Win8 64				
GPU Clock	972 MHz	Memory	1250 MHz	Shader	N/A
Default Clock	972 MHz	Memory	1250 MHz	Shader	N/A
ATI CrossFire	Disabled				
Computing	<input checked="" type="checkbox"/> OpenCL	<input type="checkbox"/> CUDA	<input type="checkbox"/> PhysX	<input checked="" type="checkbox"/> DirectCompute 5.0	

There are some cases of strange glitches resulting of AMD cards combination with boards of the third par-

ties (non-original). The Gaming 3D is no exception of this rule. The issue started when the second card stubbornly refused to be recognized by system, and the game in CrossFire mode was disfigured by stripes across the screen. Errors in drivers? Raw BIOS? Bloody Battlefield 4 which keeps missing something? No, not at all. Strange glitch received strange solution: the cards were rearranged in places, and the system began working without customization and manipula-

tion. So if splicing AMD cards in tandem you will be pursued similar issues, do not rush to carry the card to service center, scribble complaints on forums or reinstall drivers. The solution can be very simple).

The CrossFire itself works well: both cards in the games loading is almost similar, the performance increase can be seen with the naked eye (especially in the heavy modes). I did not have time to customize for test purposes the latest hits (Titanfall, Wolfenstein: The New Or-

der, Watch Dogs), I tested it in Battlefield, MechWarrior Online, and Metro: Last Light. To be honest, no freezes, hang-ups



or something similar to what many fierce opponents of CF mode in general and AMD products in particular claim, I have not seen. Stable, quickly, effortless performances, latest drivers (Catalyst 14.6 Beta) behave well without obvious glitches.

By the way, pay attention to the power supply in the testbed configuration: for a top Intel CPU, couples of R9 280, two hard drives and one SSD, the 550 W was sufficient ;).

In general, CrossFire works perfectly. Releasing R9 280X Gaming 3G MSI gave a good account of itself. The product is of good quality, though has its own pe-

culiarities. Price of devices is within moderate RUB 10,000-11,000 depending on the store. However the fans to cut out every penny can search in flea market for much cheaper offer of Radeon HD 7950)).

Testbed

Motherboard: ASUS Z87-Expert

CPU: Intel Core i7-4770K

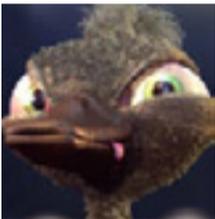
RAM: AMD DDR3-1600, 8 Gb

Storage: SSD Plextor M5, 256 Gb

Power source: Enermax Triathlor, 550 W

Operation system: Windows 8 x64

Video card drivers: Catalyst 14.6 Beta
14.200.0.0



Mazur

mazur363@mail.ruMusic: **Black Keys**

Wi-Fi-adapter **netis WF2150**

Variety of mobile broadband dongle keeps growing making price falling down. Subject adapter netis WF2150 cannot boast low price or reach configuration. It is common Wi-Fi adapter of annoying 802.11n. Black body covers Ralink RT5572N chip with binding and two small antennas. For external antennas the chip is fit with two pigtails (small high frequency connections), which do not allow to connect without body dismantling.

Second traditional drawback of these gadgets is overheating in case of lengthy and active use. Adapter has lost network connection for the first time after one hour of work with torrents, second network er-

ror emerged after an hour and half. It is worth noting that due to active air cooling chip feels itself better without body.

Such suboptimal parameters forced some modifications, comprising fitting of



convenient SMAs for external antennas, and installation of external cooler for micro chip. These modifications provided for normal operational temperature below 45 °C and data exchange limited by antenna properties only. However the chip is not provided with any amplifier, this "sensitivity" of the dongle is rather common, but good (7-11 dB) pole antenna will allow it to find all hot spots in the area. Internal antennas are sufficient for in-house use or in vicinity of hot-spots, and by factoring from the hot spot (more than 10 m) or going behind the wall will be faced with speed downgrade and ping increase. For sure there are some popular remedies of reflector or can reflector, but these significantly increase the whole dimensions of the gadget. However this solution fits for stationary use, even though the chip is

operational at -20...+65 °C, whereas plastic body can be insulated by superglue. I do recommend placing radiator inside the plastic body, otherwise in hot summer you will face high time cooling micro-chip and forced interruptions.

As said netis WF2150 is rather mediocre dongle, subject to concise treatment providing for rather stable connection quality, fast to initialize and relatively low priced.

Device: Wi-Fi-adapter netis WF2150

Price: RUB 550

Wireless: 802.11n, range 2.4 and 5 GGz

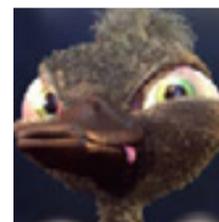
Max. speed: 300 Mb/s

Interface: USB 2.0

Dimensions: 93 x 7 x 15 mm

Weight: 16 g

Details: www.netis-systems.com



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Music: Skylark

Keyboard **Gamdias HERMES Essential**

Time, when each new keyboard on the test made me stick my neck out to the box shouting: "Macros! Additional keys! Customization!" have passed. The convenient «boards» of the nineties cannot provide with such services. There were only 102 or 103 keys, which were either pushed or not: on or off, one or zero.

After such austerity any more or less advanced in terms of functionality keyboard seems to be acme of perfection. Whereas all products for gamers by known manufacturer, with additional ports and backlit ... will help you to win in game, and solve routine multikeys combination in the work programs by one touch. Macrokeys!

Though saying "best is the enemy of the good" profess to be correct in this case. Everyone has its own understanding of balance between functionality and size, number of features and ease of use. Thus I continue trying variety of keys, noticing successful solutions. I think balanced Solution can be made only after having tried more than hundreds of "masterpieces".

Today's agenda comprises keyboard by manufacturer we discussed in last 674 is-

sue - Gamdias. Gamdias. Gam-di-as. God, who comes up with these name brands! And logo design ... Okay. Mechanical keyboard has juicy and appetizing sound and red glows. Though all mechanical keyboards are different, thus it took some time for me to get used to HERMES Essential after Roccat Ryos (some two days). I kept missing the desired key, swearing, taking aim and missing again.

Main layout was preserved in its original form without touching any of the major blocks, and all additional keys are positioned at a considerable distance, so when missing the right key user would not start any specific macro. As a matter of fact they changed doubletree near the numeric keypad, which is also known as "arrows", by adding two macro keys. The manufacturer did this to relive his maj-



esty the Gamer from stretched fingers in effort to activate the desired script, reducing distance for quick and well-oiled movement to five millimeters. At the same time, missing the "left" or "right" keys will result in macro activation for amusement and surprise of opponents and commentators. For sure, if savvy gamer will have month and half or two to get used to HERMES board, positions of all keys will be learned heart, and top class will be demonstrated at any tournament. I am not that skilled, thus I just blocked this pair of keys, to stay on safe side. Though the whole idea makes sense and will be useful to someone.

As all gaming keyboard HERMES has lighting. Speaking precisely, the letters are glow providing for clear distinction in darkness. Lighting as well as macros is customized by proprietary software, lacking which makes the keyboard senseless. Even though I have already studied this software, when setting mice functions, I have wasted for one hour to set keyboard for different their tasks, needs and velocity.

Overall impression is "almost perfect". The "almost" emerged, because, in my opinion, the manufacturer overdone number of macro keys. Those that are located below spacebar shall be placed above F

keys. Since keys location on the palm rest is really inconvenient. Even though these are slightly recessed into the depths, the little effort required for push, make them dangerous if missing spacebar in the heat of fight.

In general this is the ultimate claim. The keyboard is comfortable, heavy, moderately compact and ergonomic. (I'm happy that "broken down" layout of Microsoft did not catch on!). Keyboard is fitted with one USB and 3.5 mm diameter audio jack, and cable of "military standard" (the top 5 favorite phrases of marketers) looks nice and unlikely to be broken down even at active moving HERMES. Price of goody is RUB 5,500, which is appropriate for mechanical gaming keyboard with enhanced reliability.

Device: Gamdias HERMES Essential GKB2000 keyboard

Price: RUB 5,500.

Interface: USB 2.0

Number of keys: 123

Cable length: 2.2 m

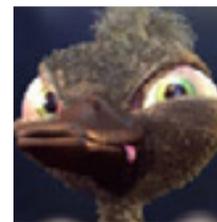
Keys type: mechanical, Cherry MX

Additional keys: 19

Sockets: 1 x USB 2.0, 2 x 3.5 mm jack

Dimensions: 475 x 39 x 177 mm

Details: www.gamdias.com



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Music: Current Value

Speaking on power sources, Ralink and home server

You can send your questions, wishes, comments and remarks by the following address: m@upweek.ru, and technical topics can also be discussed in the Technical Support section of our group in VK (vk.com/upweek). Answers to technical questions will be published in the Technical Support category, and we will take into account your wishes and remarks to the posted material for the future. Important issue when writing a letter: **“hardwaresupport”** combination of letters shall be entered in the Subject field (without quotation marks and with lower case), otherwise the spam filter will direct the message to rubbish, which is deleted daily without viewing. Alas, it is a least-evil solution to protect us against a huge amount of rubbish overflowing any open mailboxes.

Q: *Good whatever time of day it is where you are! Would you please consider the following situation: we have D-Link DWA-566 with 50 m coverage and internet access. Coverage check with tablet proved that there is no wi-fi in room. In other words, if I buy TP-*

LINK TL-WN722NC with antenna, it will not see the wi-fi? Or of cell phone and tablet gathers wi-fi from own chip without boosting? If there is a computer with separate wi-fi chip (for ~50 m), than this chip will see 50 m coverage of main wi-fi source?

A: "Twas bryllyg, and ye slythy toves;
Did gyre and gymblye in ye wabe" ("Jabberwocky" by Lewis Carroll)

Dear friends, we would be absolutely grateful if after writing questions you would read and check for sanity. Sometimes your posts are more like a conundrum, of which we are forced to make sense. Not to mention editing for publication (to free the audience from conundrum solving). The above is an example of unedited words flow from one's heart. Enjoy.



Closer to topic: Wi-Fi receipt depends on length (diameter of antenna) and power of transmitter, its location, material and quality of walls, distance to users and weather conditions ... Thus, considering these heap of variables each issue with Wi-Fi connection needs tailor made solution unless you are an armchair strat-

egist. For sure on weak Wi-Fi module is unable to cover all of corners of your villa built of bricks. Therefore, the less number of walls (main walls and hick ones) separates the device from hot spot, the better. The more powerful transmitter (better use at least one for each floor) the better. In large multi-office business centers providing for full scale of signal, the number of hot spots is equal to number of large premises, and these spots are receiving signal by wire, rather than by air.

Speaking from own experience: 5 dB antenna is sufficient to cover one to two rooms apartment. However for a three rooms apartment (especially with large corridors) you will need a hot spot and repeater. And larger and/or several level apartment require tailor made solution (check for the number of repeaters after buying hot spot).

Q: *I have the following issue: Windows 7 is stopping loading at logotype stage and starting reboot. Being an armchair warrior I decided to reinstall operation system. However, at the last stet of installation process, PC starts unexpected reboot. Rebooting results in opening of installation window, which results in reboot, etc... Then I decided to clean sockets from dust. When*

I recomposed system back after cleaning, PC remained dead. As a matter of fact, by some miracle PC started with HDD light flickering, video card and CPU coolers working at low speed, and power source making some ticking and clicking, although no data was provided on monitor. After some pause I tried to turn on PC again, it started for 3-4 seconds, then it stopped working (the process was repeated several times). The desktop configuration: Core 2 Duo E6600, ASUS P5K, FSP 500 W. Age of PC is five years (or more). What should I do?

A: You should start with power source, since there are too many evidences of its guilt. The five-years old FSP has 90% chance to use old platform, which is sensitive to dry electrolytes (there is high probability that capacitors lost capacity during five years). Therefore, the output voltage is littered with high frequencies, which deteriorates system stability. If you can, try to replace with 400-450 W power source.

If you cannot use other power source for diagnostics, short-circuit 13th and 14th contacts of ATX24 socket plugging some CD-ROM as additional load and check voltage by multimeter on sockets. Also you can look into your power source:



thick capacitors, overheated elements and other evident results of long use are rather obvious. More details about power source diagnostics were published in 639 issue of the magazine in the Support section.

Q: *Background. I decided to upgrade my PC: therefore, replaced power source 400 W by 600 W. After replacement PC started hanging, becoming unresponsive to keyboard, monitor is turning off or becomes mono-colored. The issue emerges at gameplay with heavy load on video card (card is heated to 70°C, thereafter the above issue emerged). The issue was corrected by return of the old power source (400 W). PC is working like a Swiss watch. The diagnostics of the new power source Corsair in service center revealed no defects. Today I performed load test with HDD plugged using common multimeter: results were: red +5V, all yellow +12V, orange +3.3V, blue*

-11.9V, violet +5V. I blamed lack of cooling and dry thermal paste, therefore took down CPU and video card, spend some 75% of thermal paste tube all was futile. The errors return after installation of new power source and go away after placement with old one. Configuration: Athlon II X4 630, 8192 Mb RAM, GeForce GT 240, MSI 770-C45 (MS-7599), Corsair CX600 and Real Power 350X. May be there is some other procedure of load test required? Or this issue is due to incompatibility?

A: It's rather interesting case. As a matter of fact the power source id main culprit. CX is economy series of Corsair using suboptimal platform, which may have erroneous settings, and by far your moderately powered configuration will feel better with old 400 W rather than new one 600 W power source. Speaking frankly, this is an even-stein change.



Even if you will find the solution to issue, the 600 W from economy series is almost even to 300 W. If you want good power source, pay attention to 500-600 W models pricing RUB 4,000-6,000. This range comprises real nice offers by Antec, Enermax, Cooler Master, Seasonic, top series of Corsair, OCZ. Referring to the subject power source: I would suggest you to try to return it to shop, or cash – back within warranty.

Q: *Background: I have bought HP laptop with Ralink RT3290 802.11b/g/n. I have router DIR-615, one desktop and three other laptops. ISP provides connection at 50 Mb/s, and all devices are using this router and having connection of 50 Mb/s, however the laptop with Ralink RT3290 gets maximum of 20 Mb/s (drivers were updated). Would you please advice on solution! Thank you in advance!*

A: Ralink tends to cause problems sometimes. First of all the Ralink based devices are unfriendly to TKIP and working well with AES only. Then, these devices are usually provided with n, mode off, as according to driver developers, this mode is illegal in our country. Therefore, you need to set it manually.

In register editor (Win+R, Enter, "regedit" without quotation, Enter) find string HKEY_LOCAL_MACHINE\SYSTEM\CurrentControlSet\Control\Class\{4D36E972-E325-11CE-BFC1-08002bE10318}\XXXX\WirelessMode. Where XXXX may be 0010 for Win XP, 0008 for Vista, 0011 or 0012 for Windows 7, meaning for Windows 8 is unknown, thus you need to search for it within that range.



Replace WirelessMode parameter in the string to 7, and if there are some other parameters, please set as follows: AdhocN40MHzAllowed in 1, AdhocNMode in 1, LinkSpeedStatus in 1, WMMCapable in 0. Reboot the PC – the issue should be corrected.

The second approach is combination with the first one. In the register editor starting search for CountryWirelessMode parameter, and replacing the found val-

ues from 10001000 to 11101110. This parameter may be placed in the same string as WirelessMode (see above para). Save changes and reboot.

Third step: do not forget about router settings. Usually nobody looks into extended Wi-Fi. The default sets channel 1, or 6, or 11, thus these channels are overloaded with hot spots, whereas the others are empty. Thus, it's worth to reset the channel moving to the empty one. The selection of the most free channel may be made with use of InSSIDer providing information on high-frequency channels. Channel width shall be selected using trial approach between 20, 40 and Auto.

These basic settings cater for stable operations in majority cases, whereas all exceptions shall be subject to specific consideration.

Q: *Hello! I have heard saying that the one can make home server using common hardware without some expensive bits. When I addressed with this question to internet community, I have got very polar responses: ones are saying that such server is possible and will be operational, whereas the others threatening bugs and errors of such device. I do not want to spend money on expensive motherboards and CPU or*

specific RAM, however I want second PC for torrents and moves. There is no need in high productivity, though silence is a must. Is this possible, or better forget till things go better?

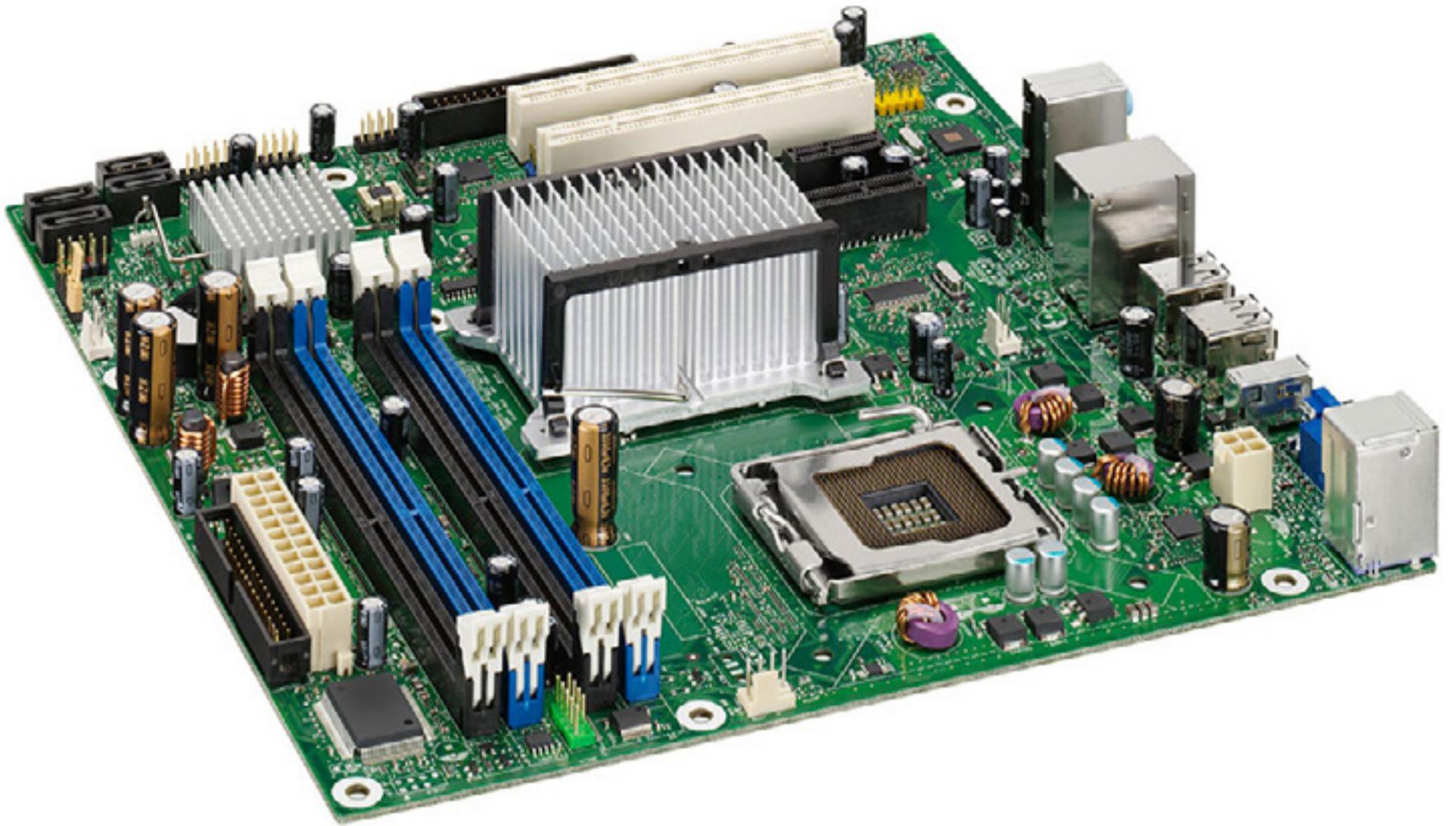
A: Well, as a matter of fact, you can assemble home server without expensive units, but in exchange you will need to employ a lot of manual work with various small tools: soldering iron, drill, grinder, etc. Moreover, the works will be time heavy, consuming several nights in a row (probably one week). If you are ready than proceed with reading, otherwise stop wasting your time and go shopping retail versions named "I earn lots of money and instead of working out prefer to buy thing that is going to be working with a single touch of button".

First of all you need to select spot for the server. It is better for server to be located far from beds (passive PCs are really specific), the most silent coolers will be to loud in night. Additionally the future server shall be located in spot with natural air flow (please do not cumber server with boxes and bundles).

Then you should define the body, or base for body. Therefore, chipset form factor, as well as amount of peripheries and storages shall be defined. We recommend take

as basis some durable and simple body (better take some desktop).

Third issue to solve is cooling. The cooling shall be provided with x2 reserve (at east) in terms of heat dissipation. This rule is applicable to both spot coolers (video card, CPU, system logic, HDD) and general coolers on the body. Coolers are better to be configured for inflow (make necessary opening and closing unneeded). I recommend using good non-flammable materials (ideally parts of second body). For fitting use welding and bolts (but with red thread lock) riveting. Select coolers from reliable and brand series, preferably industrial models with ball bearings and magnetic suspension. If you do not want listen to cracking of dead cooler (since manufacturer was not ready that its products will be used 24/7 instead of 8/5) in two months or so. Coolers mode shall be selected by one-third of the maximum allowed, i.e. 12 V shall be placed on +5V, whereas +12 V require 24 V models (my 120 mm Jamicon works for five years without any breaks). Install air filter prior to intake coolers. Better use the round ones designed for trucks – this option is cheap, effective and practical. Filter will prevent dust clogging your server making it overheating within couple of months. Output openings shall be



closed with fine steel mesh preventing pests (insects and rodents) making nests in this warm and closed place.



Electronic part: better select industrial motherboard using old chipset, with mATX or ITX form factor. These are rather frequent on all kind of flea markets. Advantages of these motherboards com-

prise designation for 24/7 operation and minimum errors possibility. Select any CPU suitable for the motherboard, power source with x3 capacity reserve (to make is work long hours without overheating). Thus for Celeron based server with three HDD and two network cards I selected FSP for 450 W (recently I published article in the magazine). Such selection has a lot of advantages: no heat, relieve of built in cooler use and provides for chip placement in the bottom part of the body (high power safety matters).

Five home servers (torrents, files base, routing) assembled based on these rules are working for 2-5 years (depending on time of installation) without any breaks or errors.



The **best** free applications **for Android**

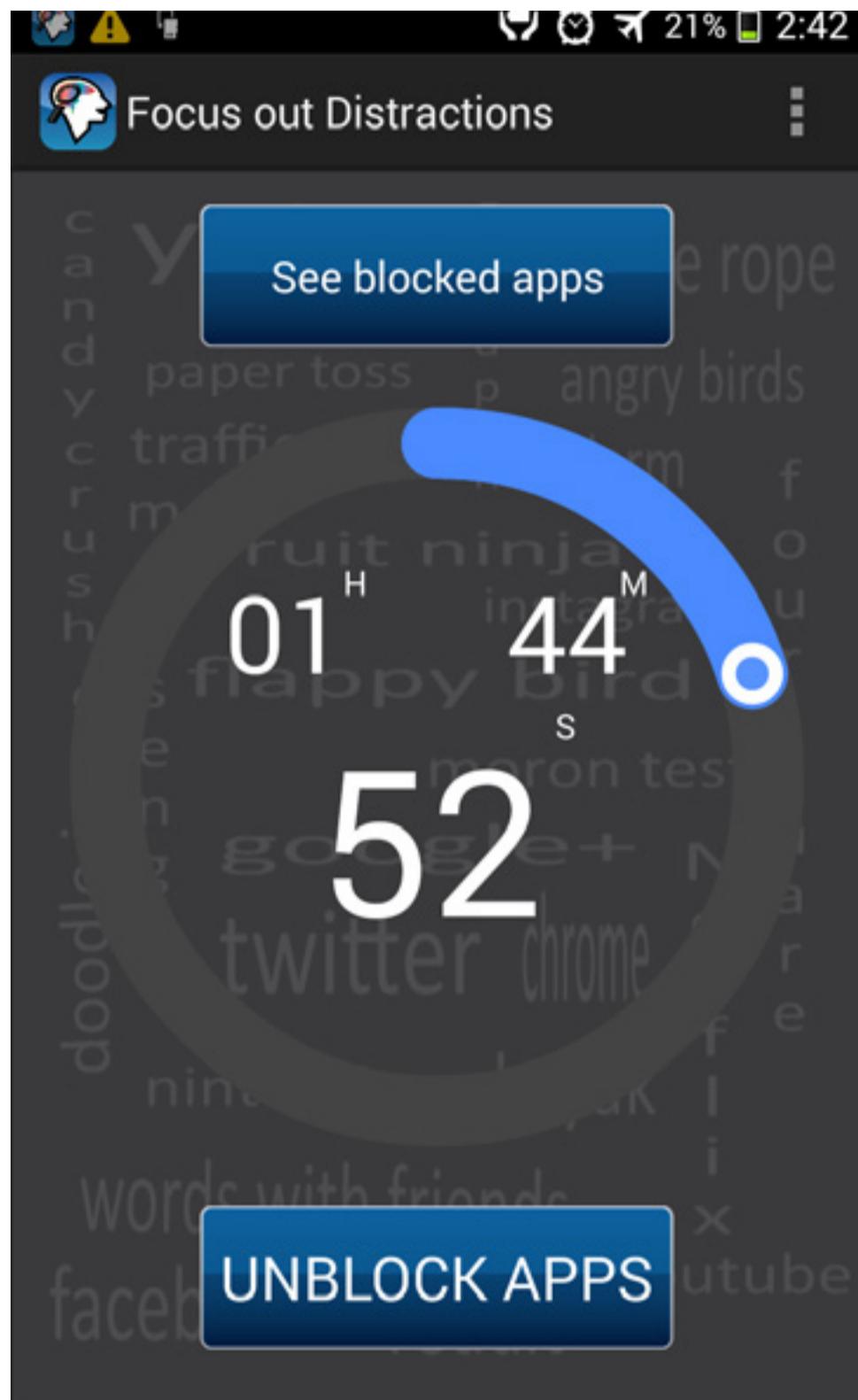
Alexey Krutovenko
alteridem@rambler.ru
Music: **Kamelot**

I'm promising to stop checking mailbox every five minutes ... Anyway, I'm serious adult person, this five minutes in game would not hurt much? It's three o'clock in the morning? It's impossible! Developers are tripping over themselves to make compelling applications that for some connivance can become real black holes absorbing time. If you do not have enough courage to cope with this situation, you may ask for help from Focus out Distractions application.

The application was designed to temporary block access to selected applications. The work principle is very simple. After scanning your device the application will have list of software installed, you can select from the list one or several time-eaters and set timer. The maximum lock term is eight hours. Upon elapse of the set tem, the application will be locked leaving you enjoying the withdrawal syndrome. Willy-nilly user will look around and spot green grass and lovely people. Software developers have rather specific sense of humor. Thus there is option for unlocking application prematurely, which requires quite a squeal. Are there any applications able to relocate focus from the smart phone? Not to mention applications free from advertising? Feast of altruism!

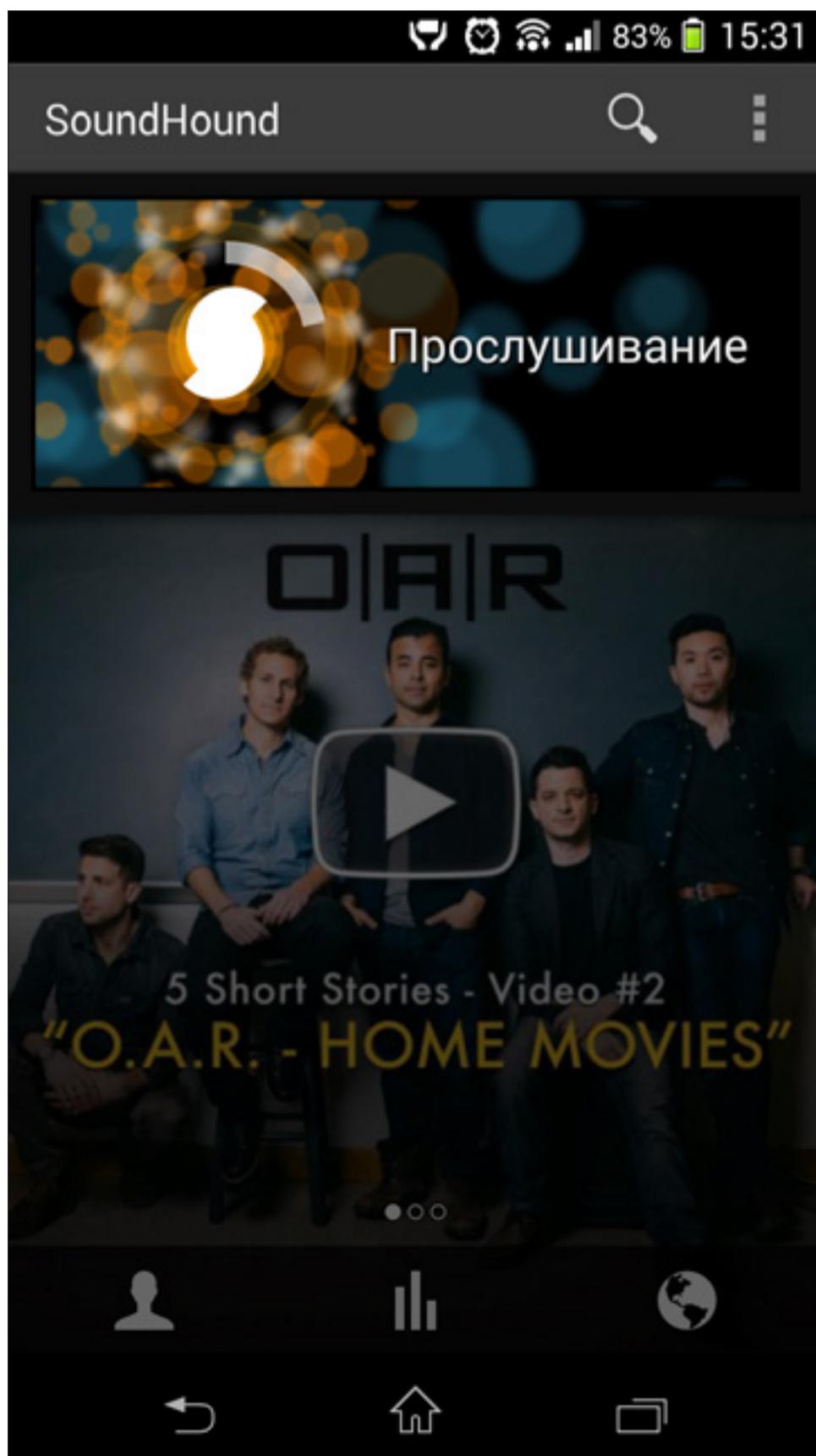
The last week was marked by several interesting updates. The update was released for RSS-reader gReader, which is one of the best representatives of this genre. If you like the news readers with the classic interface, this application is perhaps, the best. Main features of gReader comprise operation in offline mode, flexible subscription management, and a lot of settings. The updated application allows customization of notifications

and improved tags control management. There are also some additional themes, and of other minor additions.



The flagship applications by Google (mobile Gmail) were also updated. Besides the cosmetic changes to the interface (location of settings, contacts display) app learned to save email attachments to the Google Disk, as well to print attachments and letters. Option to read automatically shortened long letter was also added.

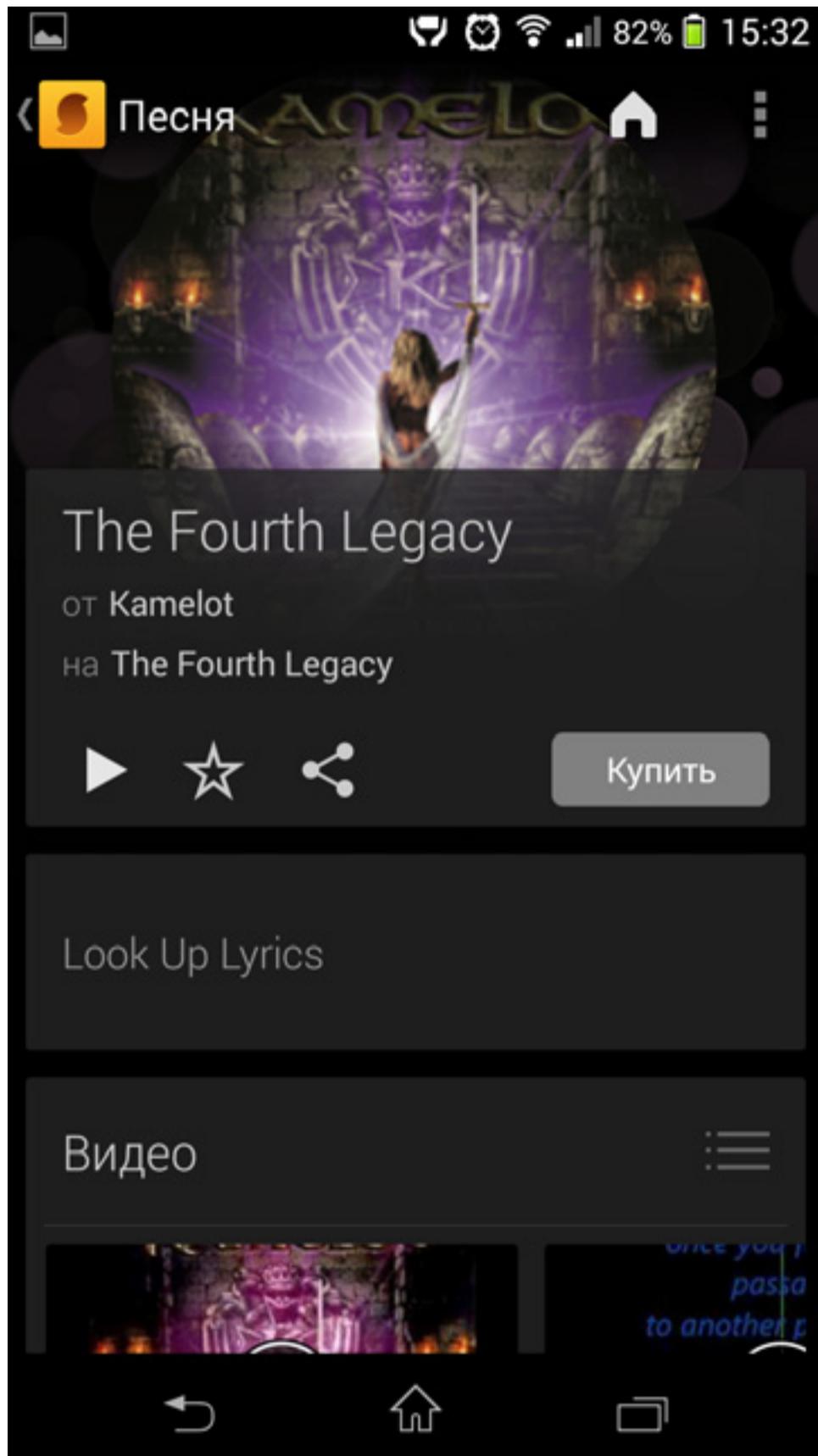
Material update was applied to music search app SoundHound. This soft works in tandem with the music search engine Midomi and is distinguished by reverse search mode. In other words, the system can recognize the music being played by your device, or use the microphone held close to the speaker, or decipher humming of the phragment.



The interface of the application is now demonstrating more details on the music and artists, each of the tracks is provided with photo galleries and links to videos, and recommender systems of similar music search. The personal pages performers got similar design.

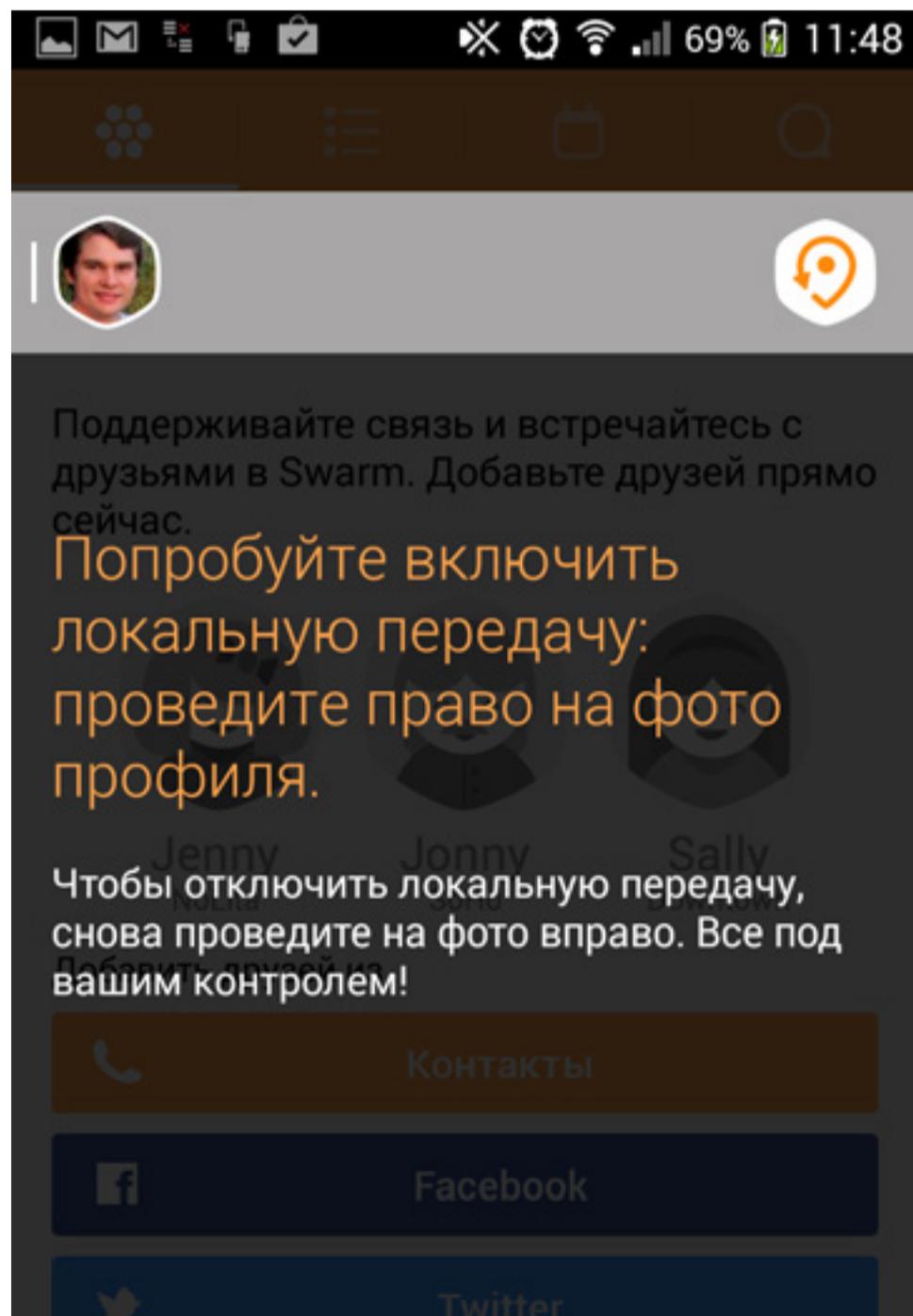
Let's focus on the most important: modus operandi. It's obvious that SoundHound is able to recognize music known to Midomi only. There are no Russian performers, only international ones. I've got feeling that search for instrumental tracks is less effective than that for the usual songs. There are three search modes differencing by the way of query entry. The bets one (which was rather obvious) allows searching for the currently played track. Though need in this search mode is not that common, since modern players are actively looking for the missing data in the web, whereas radio stations usually provide additional information on compositions in the air. Thus this feature will be useful only if your smart phone received files with erroneous tags. Search "from the speaker" requiring user to bring its gadget to the speaker is rather good as well. The main issue is with micro positioning. Sometimes it helps in the field conditions (in some café). The

main condition is to decrease interfering noise.



The most interesting mode is "voice" search, allowing humming the interesting composition. Though, in this case we may face serious issue with bushel basket and impossibility of carrying the tune. The search basis in this case is Midomi records provided by users. Thus, your search que-

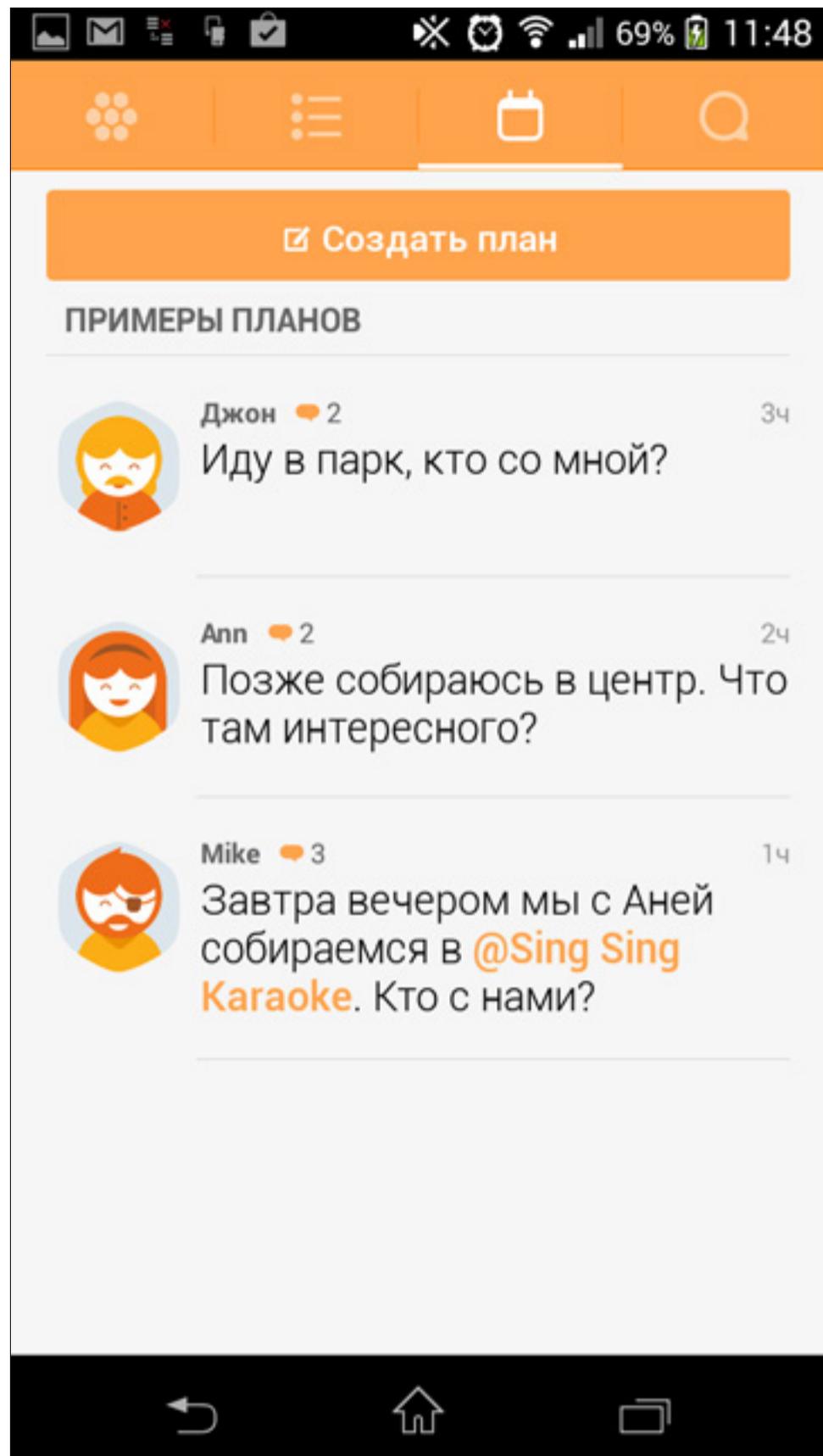
ry is checked to match signatures provided by other users, who managed to find the right song. In addition to common issues with voice recognition, this type of search imposes many restrictions. To find the sought after composition you would need to meet certain conditions: try to use the whole music phrases – not shorter than 10 seconds, do not try to pretend to be music band. If the composition has words, and you remember at least a couple of sentences or verses of the chorus try to hum them as clear as possible.



In order to leave a message “Peter and Pan were here” in digital era, you do not need to go in the middle of nowhere and take risks jumping over rocks. To perpetuate its mark in space, it’s enough to push the button. The Swarm style applications are designed to relive homo smatphonicus of pioneer spirit.

Trend for separation of large applications into smaller ones got support from Four-square service. check-ins and everything connected thereto where separated into single application. According to devs, such division was made on the basis of research of mobile Foursquare users habits. In most cases this application is used to check-in in some interesting place, or to search for new places nearby. Separation into two applications was aimed at making these operations easier and more convenient. Swarm is supposed to be responsible for the first “check-in” part. Therefore, the application turned to be similar to simple social network. To find proof thereof, it is enough to see the list of the app features.

Check-in is almost the only action required from the user by this application. Moreover, you can enable automatic tracking of your movements. Later on you can make search of the route using these marks.

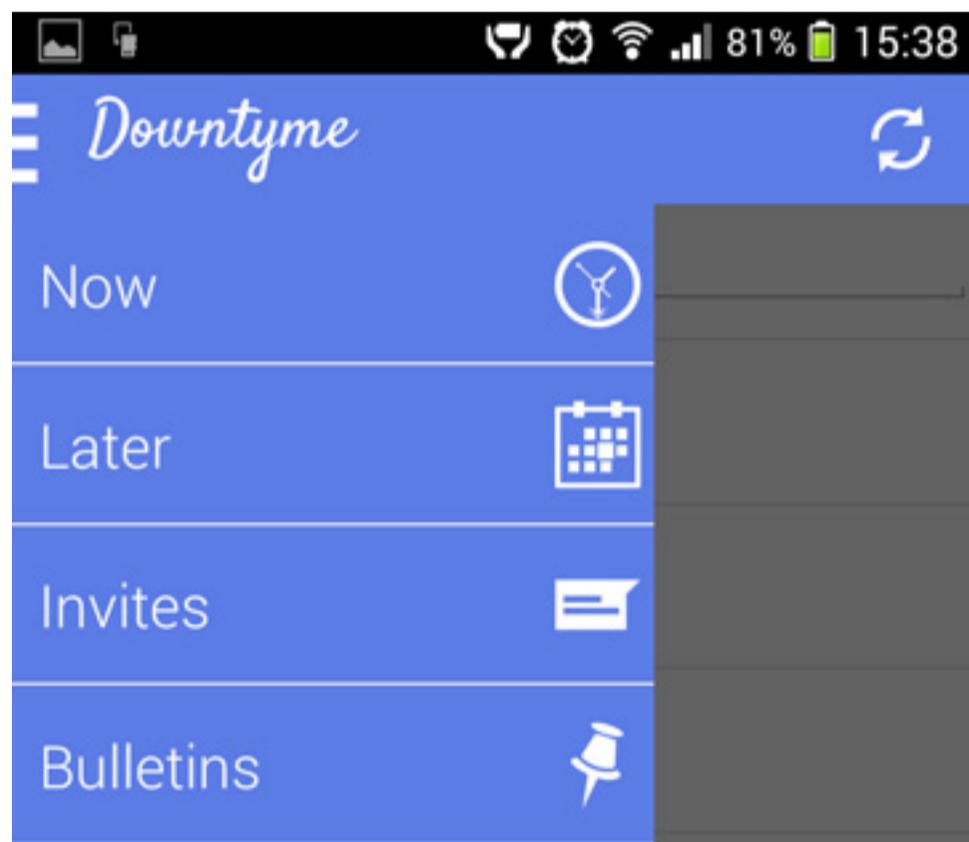


The marks are used for operations of other functions of the application. Combination with contact list allows user obtain information on friends using Swarm location. Thus making possible to develop joint travel plans, or simply to agree on an unscheduled meeting. As a matter of fact the whole interface of the app is built around such scenarios. Application com-

prises news list and integrated messaging system and map with marks of your friends location. Generally speaking this is rather convenient, especially in leisure time. However, for normal operation of the software your friends and you need to be in the same city or district. In case of numerous contacts around the world "social map" Swarm loses its practical use, turning into cute accessory and an additional way of travel boasting. It's worth noting, that Foursquare attractiveness promotes rapid establishment of contacts. Thus, from the moment of installation till first queries I waited not more, than ten minutes.

Although separation of functions by Foursquare was incomplete (it would be strange, the application would not be using reference base by Foursquare). After a while, based on the analysis of your movements, the software starts suggesting places, which you may want to visit with friends. Whatever it was, main focus in Swarm is shifted to social interaction. Tips on various local offerings is mere an addition to the self-organization of friends. In this case, the reference base is not more than a competitive advantage. The fact is that Google Play already has other applications with very similar func-

tionality. Let's recall the newbie: Downtime designed to organize leisure time in the company of friends. This application is even more social, the geo marks are an auxiliary tool since the main aim of the application can be worded as follows: "I am free and I want to go on the tiles! Who's with me?". One of the interesting findings are options to hide the status and location from some people from your contact list, calendar synchronization, and option to specify "windows", when you are willing to accept invitations.



And, in the curtain line a wonderful in its uselessness, but cute application KF Billiards Free Wallpaper. It installs as wallpapers virtual billiard table allowing playing on the desktop. It's very cute and controls are simplistic. Where's our Focus out Distractions?



Deezer Music Service.

Largest Music Service in the Internet

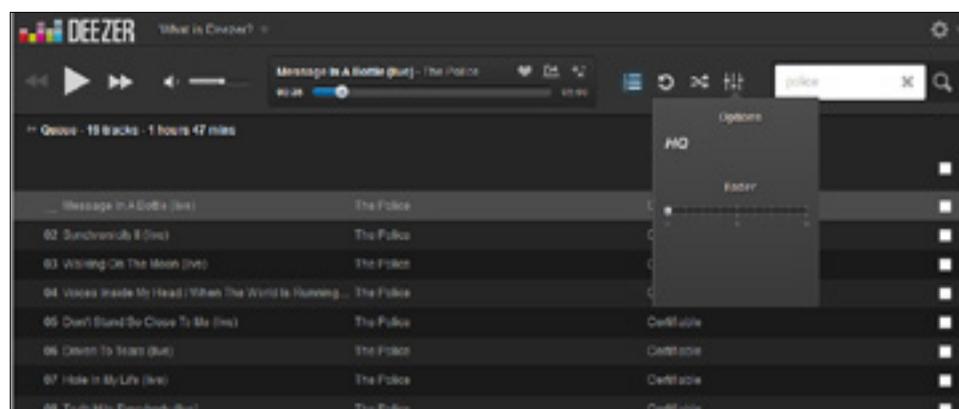
Alexey Krutovenko
alteridem@rambler.ru
Music: **Gentle Giant**

In large numbers has mesmerizing charm. Considering the stated scales of record libraries, the Deezer (www.deezer.com) music service is far ahead of its closest rivals by more than x1.5. Over 30 million tracks, this is merely a claim to be the biggest music storage in the internet. Deezer is big, really big music library there are a lot of unformatted and just rare music.

Is the Deezer's base complete and unique? In addition to music catalogs comprising dozens of millions of tracks provided by different holders and comprising array of popular music, which virtually all market participants have, each individual steam service has its unique part. Deezer is no exception in it. A certain percentage of music will be available only through Deezer's service. At the same time, Deezer may lack some composition from Spotify, however it has bigger overall size. Subject to copyright holders request several tracks are available for premium accounts only, though the overall share of such tracks is rather modest (as referring to my interests). Of cause it's impossible for one man to evaluate the entire archive.

If required, Deezer allows uploading of own MP3s for the purposes of different devices synchronization. However this is not a unique feature, there are several music services specifically built around such a function. Not to mention, that in Deezer's version this function is encumbered with numerous restrictions.

Registration of free account, the two-week premium trial is provided. During this period user can enjoy better quality, have access to all tracks without exception, and using the mobile version.



Unlike to Internet radio stations, where playlist is compiled by DJ or automatically, Deezer's uses model of media library with free access to albums and tracks. The normal operation is provided with web interface. Player is rather simple in control, comprising buttons for play start and tracks change; playlists with option for drag and drop of compositions and random playing. The minimum settings are available to premium account only, i.e. high-quality audio and control the damping effect between songs. That's it.

Deezer suggest building own cloud-based library on the base of selected radio stations, artists, albums and individual tracks. Buttons for adding in the playlist and to "Favorites" are placed on the player panel.

Search engine continues even good old "LastFM" traditions. There is no advanced search all search matches by artists, albums and track names are displayed on one list. The genre search solution is suboptimal. There is option for selection

of specific genres or direction, whereas theme radio classification is rather primitive (suffices to say that jazz is divided on two areas: instrumental and vocal). Thus, this system works well for quick search, but unsuitable for thoughtful study. At the same time any search results list may be used as playlist.

Comments are focused on Boards Explore and Hear This sections. Explore section uses genres and regions with tabs by the musical "eras" and (what is interesting) by labels. Nothing special. The customized

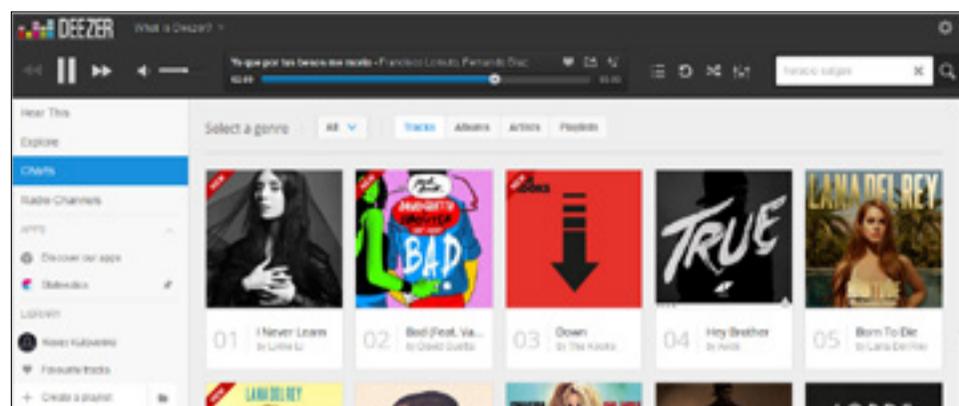
comments list Hear This is by far interesting. This section is the face of any serious cloud service. The works starts with averaged pop sets. It should be noted, that Deezer heavily relies on human factor in its suggestion developed by collective resource editors. As you listen to the music and "likes" selection, the contents will begin to change in accordance with your preferences. Unfortunately service provides no for "unlikes", so if you fancy more hard music, the Deezer suggestions may seem too frivolous. It is worth noting, that

The screenshot displays the Deezer web interface. At the top, the Deezer logo and navigation links are visible. The main content area shows a search for "the new pornog" with a dropdown menu listing search results. The primary result is the profile for "The New Pornographers", which includes a group photo, a bio, and a list of top tracks. Below the profile, there are tabs for "Discography", "Similar artists", "Comments", "Fans", and "Bio". The "Similar artists" section features four artist cards: A.C. Newman (273 fans), Wolf Parade (3,675 fans), Broken Social Scene (13,656 fans), and Stars (7,872 fans). The left sidebar contains navigation options like "Hear This", "Explore", "Charts", and "Radio Channels". The top right corner shows the user's plan as "Discovery" and a "Subscribe" button.

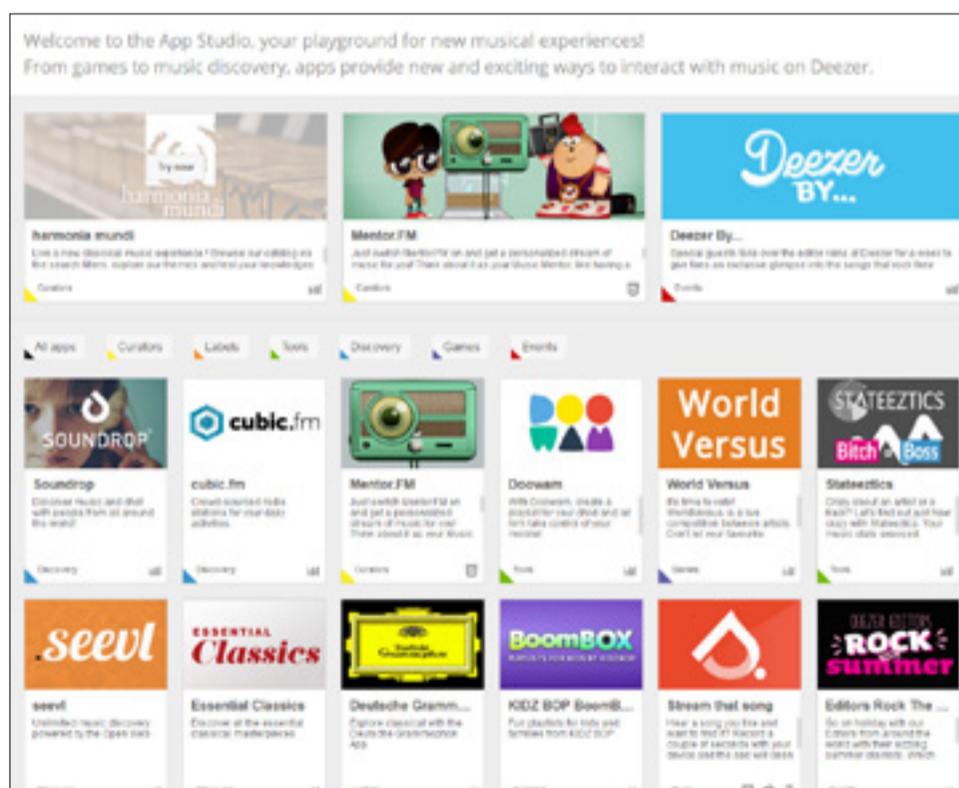
Deezer is rather inert in customization of suggestions. As practice shows, the highest influence will have assessments to the system's and editors' recommendations. Thus, in my case, the adequate results with new names discoveries began in a week after start of service use. So in terms of quick suggestions, the Similar Artists tab turns out to be most useful tool. This tab is available on the pages of all performers listed by Deezer. Whatever it was, the result is rather qualitative, automatic playlist is smooth and not boring.

The thing I did not like the most is impossibility of creation multiple automatically generated playlists, however this function is provided by some competing cloud music services (with benchmarking Spotify). Meanwhile every time I turn Deezer on, the service meets me with fresh, automatically generated playlist. Frankly, I will not judge which approach is more convenient.

Another source of the new music is the radio section. The stations have no list of files, where we can make free search. The maximum allowed is to skip the current track. There is no option for returning to the missed song. There are thematic channels and these built on the work of specific artists.



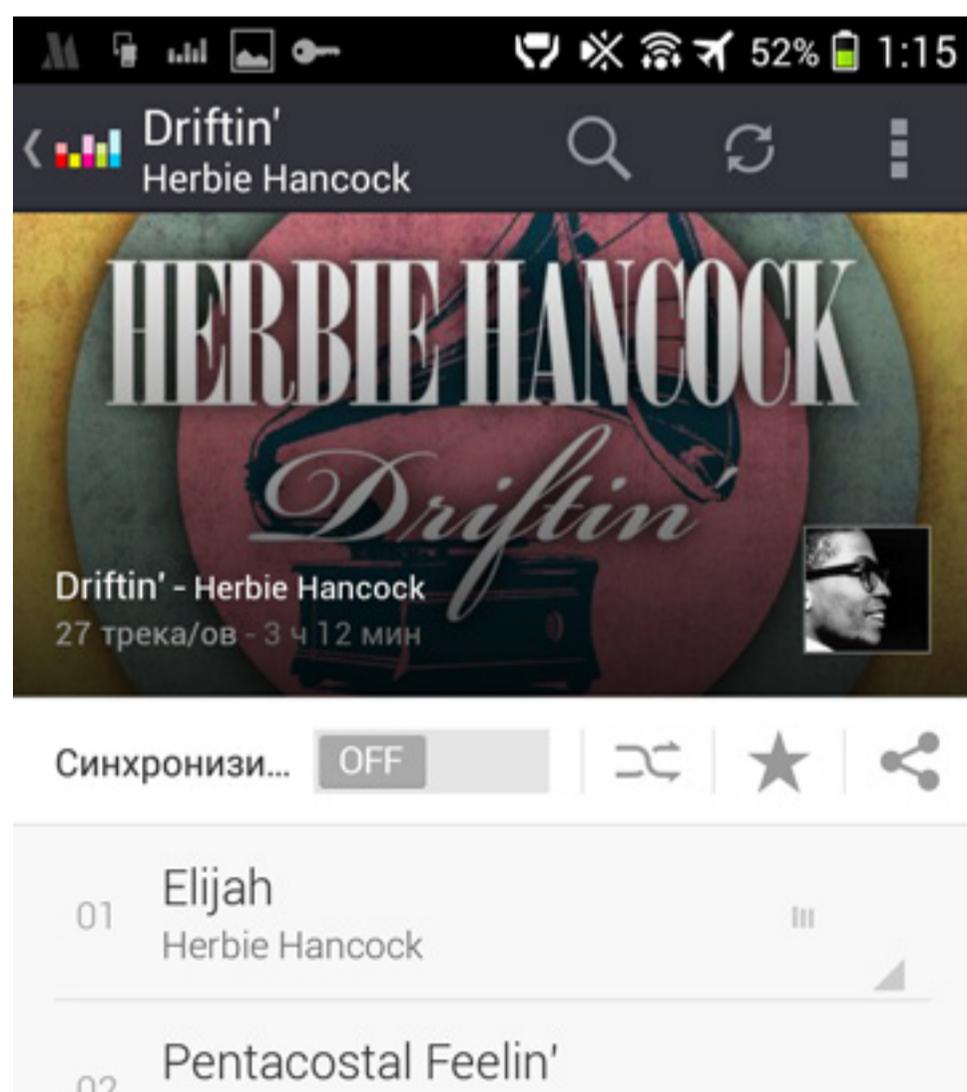
Like Spotify, the Deezer service offers personalized service your account with additional applications. Catalog of additions contains several sections, comprising application issued by certain labels for specific events, or suggesting applications, based on editors' estimates and collective mind of users. The list of available add-ons is rather short and limited to dozen. Thus it's worth trying them all.



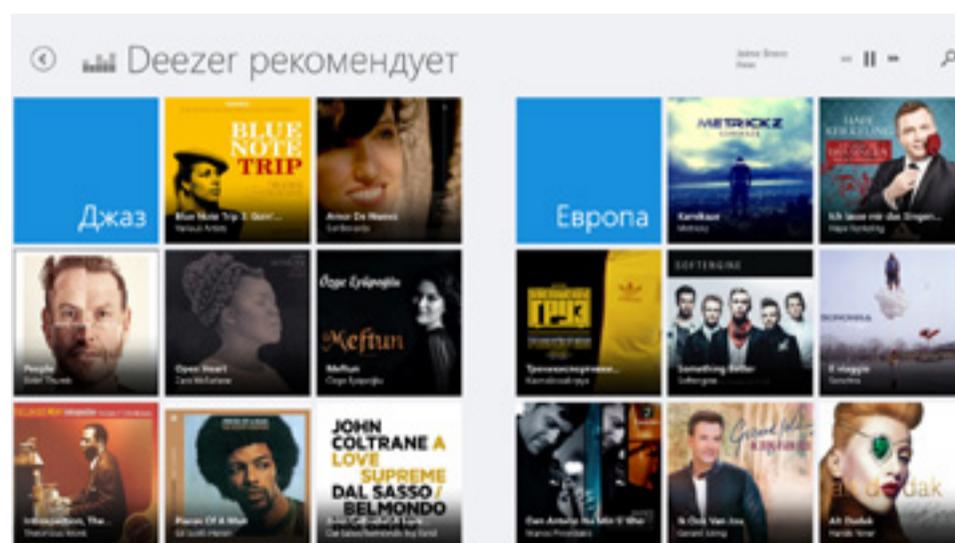
The most ambiguous side of the Deezer service is support by client applications. If Spotify provides full-featured desktop client, which may well serve as full-time

system media player and organizer to the music library (both network and local). Nobody will say that Deezer is not working in this direction, but the priorities are clearly different.

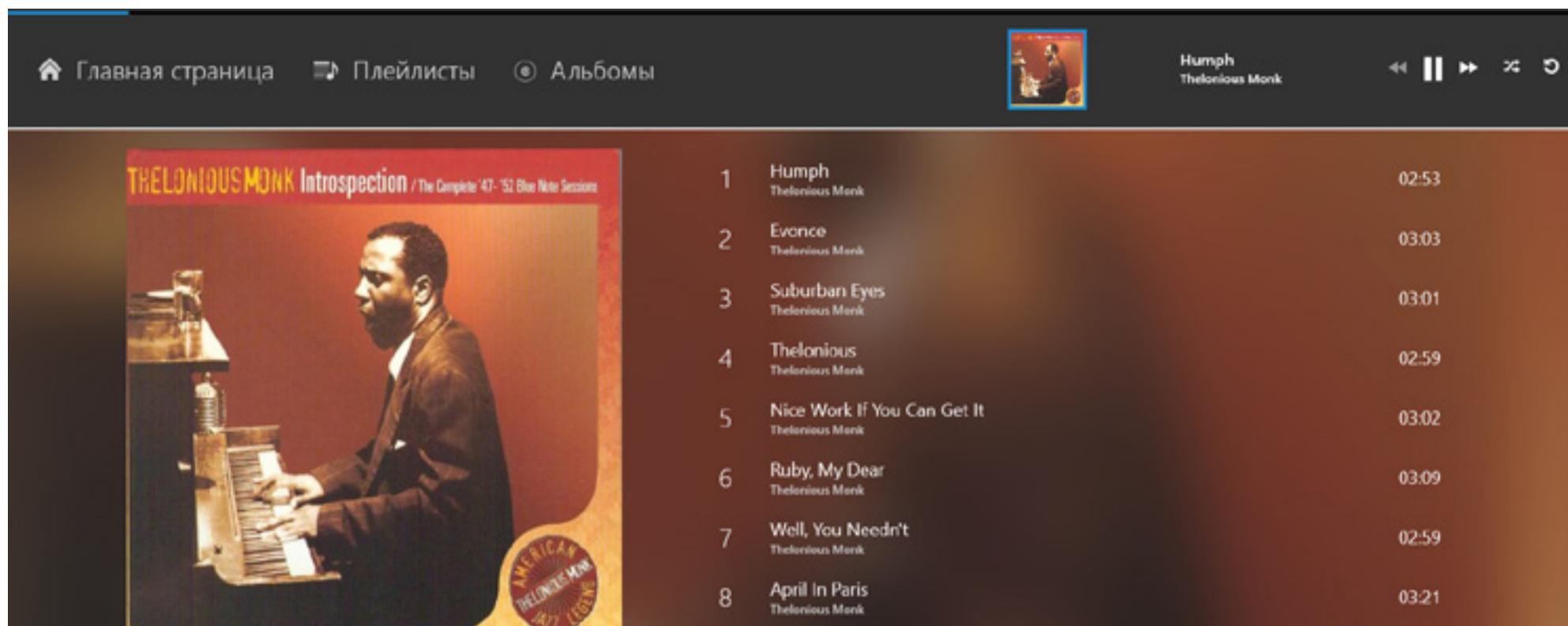
The mobile application provides for on-line and offline modes, syncs playlists and settings. Deezer as a "mere mobile player" is not the best option, since its main focus is on suggestion, thus making it more suitable to the situation: "I want to listen something, but I do not have specific wishes". Incidentally, Deezer will not operate simultaneously in the online and mobile client. The start of the second player automatically stops first notifying on the individual license conditions.



Deezer suggests Metro-app for Windows 8. Unlike mobile clients the conditions are softer. The free account can use this application with advertising during one year. The application cannot be used as replacement to media player, since does not know how to work with local files. Features are limited to recommendations, search, playlists, access to the cloud library. This application is no more than client for Deezer service, with by far less features than that of standard web interface. However this application provides for multimedia keys of the keyboard, relieving user of need to look for browser tab and addressing thereof to undertake any elementary action like spirit rewind. Thus without desktop application Deezer is likely to be doomed to "fire-and-forget" style.



So, let's sum up. Deezer is good as cloud-based music library. This service is undoubtedly one of the largest music da-



tabases. Extensive archives available free of subscription (with some minor exceptions) and unique content provide Deezer with features of universal quick reference for virtually any modern known to internet performer.

The main strong advantage of Deezer is small number of regional restrictions, making close eyes on shortcomings of the service. Deezer operates in 150 countries, which distinguishes it from the Spotify. Although undoubted merits, the Spotify service is a real pain in use due to regional restriction. Thus, to register, use pay account in the service the user is forced to dodge with proxy, intermediaries and other hardships. Deezer has no such problems. The only thing user needs to do is to turn on the service.

Some words on the premium services. The subscription is far to be cheap, but user can effortlessly pay for it using card in almost anywhere in the world. Is there need in pay account? If you need nothing more than a mere source of music or quick guide of new names, and plan to receive high-quality recordings in any other way, then there is no need in premium account. Restrictions on access to the library are rather moderate, amount of advertising is acceptable, whereas the quality of free audio stream is far to be audiophile, but sound will not make your ears bleed and is comparable to the majority of Internet radio stations.

So if you want to try some big music cloud service, the Deezer is able to become a real discovery. It is a good base for exploring the music streaming without workaround in an attempt to bypass regional restrictions.



Silicon Valley History Part 2

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How this place turned in to global Wonderland? Let's find out. Some think that the history of Silicon Valley begins with the founding of Intel, whereas the others more abreast (those who read UPgrade magazine) assume that key milestone is foundation of Fairchild Semiconductor. In reality the history much earlier some fifty years prior to development of first transistor. It was in this way...

Leland Stanford

On March 9 of 1824 in the New York city family of Joshua and Elizabeth Phillips Stanford gave birth to a boy, whom they called Leland. The first 26 years of his life he worked primarily on growth, maturation and knowledge acquisition. On September 30 of 1850 Leland Stanford married Elizabeth Jane Lathrop. This remarkable event coincided with another historical moment brilliantly described by Rybnikov in rock-opera The Star and Death of Joaquin Murieta. Your guesses are correct it was the day of gold discovery in California.



The first flush of "gold rush" began. For some reasons mostly unpleasant (fire

and other troubles) young Stanfords with other three hundred thousand Americans went to search for luck in this country, where gold was lying right uncovered. Upon arrival Mr. Stanford opened general store for miners. Obviously, the occupation was very respectable, otherwise Leland Stanford would not have been elected justice of peace. Later he realized the importance of workers of the gold mining industry education and opened Sacramento Public Library.

In 1856, Stanfords moved to San Francisco, which started as a tent city and due to the California's gold matured and turned into a real metropolis. Soon Stanford became president of the Central Pacific Railroad Company. At this position Stanford demonstrated remarkable organizational skills turning the company into leader of American, and probably global market. First transnational route with length of 530 miles was built by Stanford in 293 days. The term was astonishing since part of the route was lying in the mountains.

In addition to business success Leland Stanford was rather lucky politician. His passion for politics fully manifested in 1856, when he became one of the initiators of the California Republican Party. In 1861, Stanford had taken that post, which

was recently held by forever young Terminator. Stanford was elected governor of California. Public affairs did not make him forget about education, and Stanford established University of San Jose.

At this point, Leland Stanford has already proved himself to be an advanced man and supporter of scientific and technological progress. Thus in 1872 he funded project on study of horse running process by means of series of successive images. This study was one of forerunners of moving picture. However all these occupations were mere a prelude. The story of Silicon Valley would not have started without

personal tragedy in the Stanford's family. In 1884, during a trip to Europe their 15-year-old son caught typhus and died in Milan. The fact became more sorrowful since the death happened at time, when number of deaths from typhoid fever in the Old World started decreasing.

Leland and Jane Stanford decided to immortalize the memory of a beloved son. According to legend grieving parents said to each other: "Henceforth the children of California shall be our children" and founded the University under their name. Before creation of own school the couple began study of other universities in the



county. Therefore they visited Harvard, where they had long meeting with its president, who gave them a fair amount of useful advice and guidance.

Leland Stanford did not skimp in the memory of his son and donated for the construction fair 20 million dollars (which is about 400 million dollars in current prices). These funds allowed building some serious project. Stanford decided not to invite Frederick Law Olmsted - the famous landscape designer of those times - to design master layout of future university.

Frederick Law Olmsted was famous inter alias for design of the Central Park in New York and making green space available for all users, not just for the elite. Although critique of Stanford's choice (Olmstead had already been a very old), the architects invited to expand Stanford University are trying to insert new structure in the landscape planned by Olmstead.

Certainly the initiative of the California's governor was noticed and vigorously discussed in the media. One New York newspaper published a scathing article in which was said that Stanford University professors "would lecture in marble halls built in the middle of wheat fields..." alluding to the fact that students would not want go-

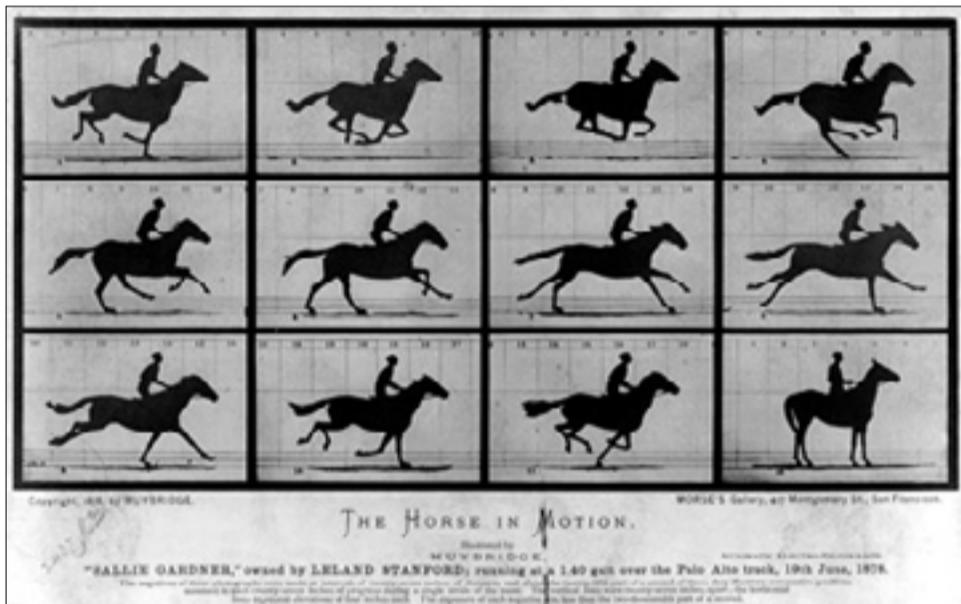
ing in the middle of nowhere. However the author of the article found a mare's nest. In the first year the University attracted 559 students, and the following year the number of departments increased from 15 to 49. University benefited from the new educational policy initiated by the Stanfords.

The first a truly revolutionary decision was that university admitted both men and women. Then Stanford University declared religious tolerance, however at that time majority of schools helped recruit students only one denomination. Finally, in the teaching emphasis was on applied knowledge, which gave the results.

First president of the Stanford University was David Starr Jordan (1891). Previously Jordan headed the Indiana University and was the youngest head of the institution of this scale (he was 34). In addition to his work as Stanford president, Jordan was known for being a peace activist. He argued that war was detrimental to the human species because it removed the strongest organisms from the gene pool. Jordan was president of the World Peace Foundation from 1910 to 1914 and president of the World Peace Conference in 1915, and opposed U.S. involvement in World War I. But it was in the XX century, whereas we need go back a little earlier.

In 1893 Leland Stanford died, and his offspring expected number of large shocks in both the direct and figurative sense. But we'll talk about next time.

Anticipating cinema



In 1872, California Governor Leland Stanford asked a seemingly childish, but rather difficult question: when the horse runs gallop, is there a moment when all four legs are straight, but have no support? To set the record straight, he drew the famous English photographer Edward Muybridge. Muybridge decided making experiment using a "package" of several cameras, powered by electric gate (by the way, in "Matrix" some scenes were filmed using this approach).

California's Governor Leland Stanford

As a result, he received credible evidence that at the canter when the horse's legs

straightened (and "spread out" as far as possible), there are no moments when all four feet are in the air, as it is sometimes portrayed illustrators of the time - in fact, horse always rests on the ground at least by one hoof.

In 1878 Stanford suggested Muybridge on continue of experiments with horses in motion shooting. On June 11 Muybridge made test with "package" of 24 cameras. The initial results were confirmed. In 1882, Stanford published a book entitled *The Horse in Motion*, illustrated with photographs. However, due to a number of highly technical reasons typographers replaced pictures with prints and drawings based on the photographs. Photographer somehow took it as an insult and filed for court. (Generally speaking, the Muybridge very high tempered - in 1874 he killed his wife's lover. Stanford paid for legal services. Muybridge was acquitted.)

The Muybridge's name is also associated with invention zoopraxiscope the progenitor of modern projectors. It was a cylindrical lampshade with pictures representing different phases of movement on walls. Viewer see one image while rotating "lampshade" made illusion of motion. In 1893 the zoopraxiscope was used for performances, which were harbingers of the first cinemas.



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