



innopolis university

A Dedicated IT Resource in Russia

**Dr. Tanya Stanko, Vice-Provost for Education
for
Workshop for Deans, Department Chairs and
Research Directors
13 October 2014
Wroclaw, Poland,**

The Building of an Innovation City: Innopolis

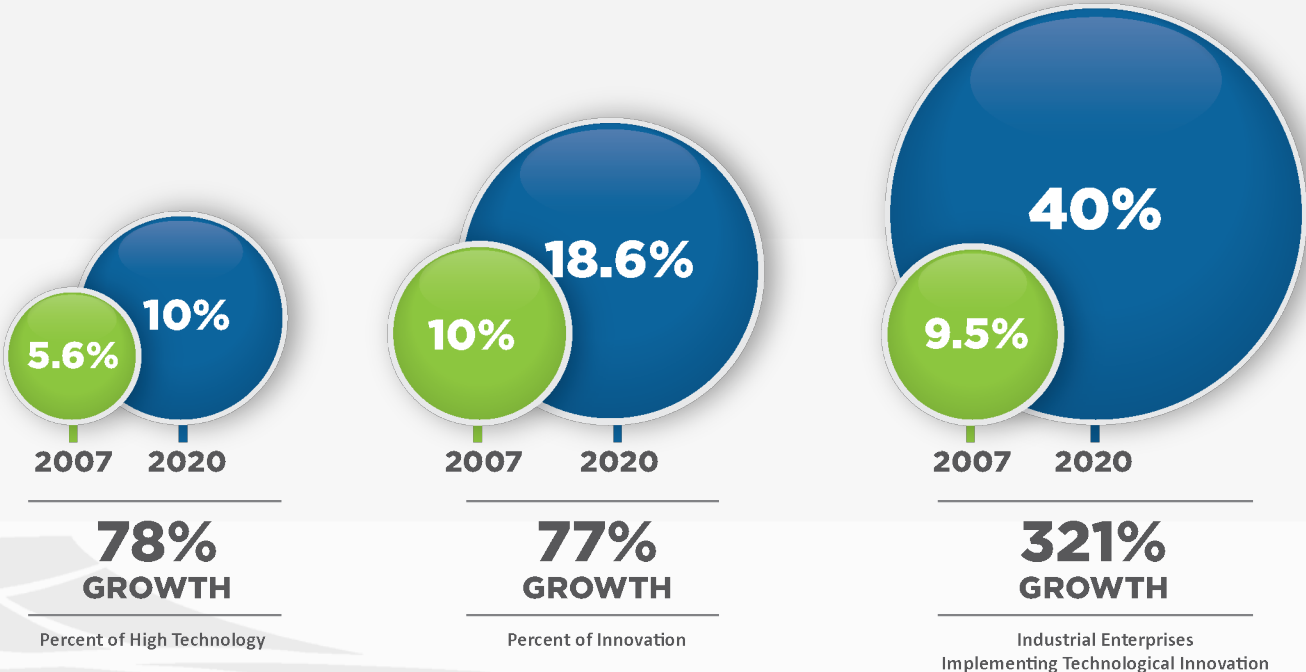
GOALS:

- **Double** GDP from ICT in Tatarstan to 7%
- **Impact** the growth of GDP of Russian economy through growth of IT industry
- **Employ** 60,000 IT specialists
- **Provide** solid foundation for the development and incubation of new startups
- **Create** an education system for school children
- **Develop** strong industry/academia connection
- **Attract** foreign capital and MNC's

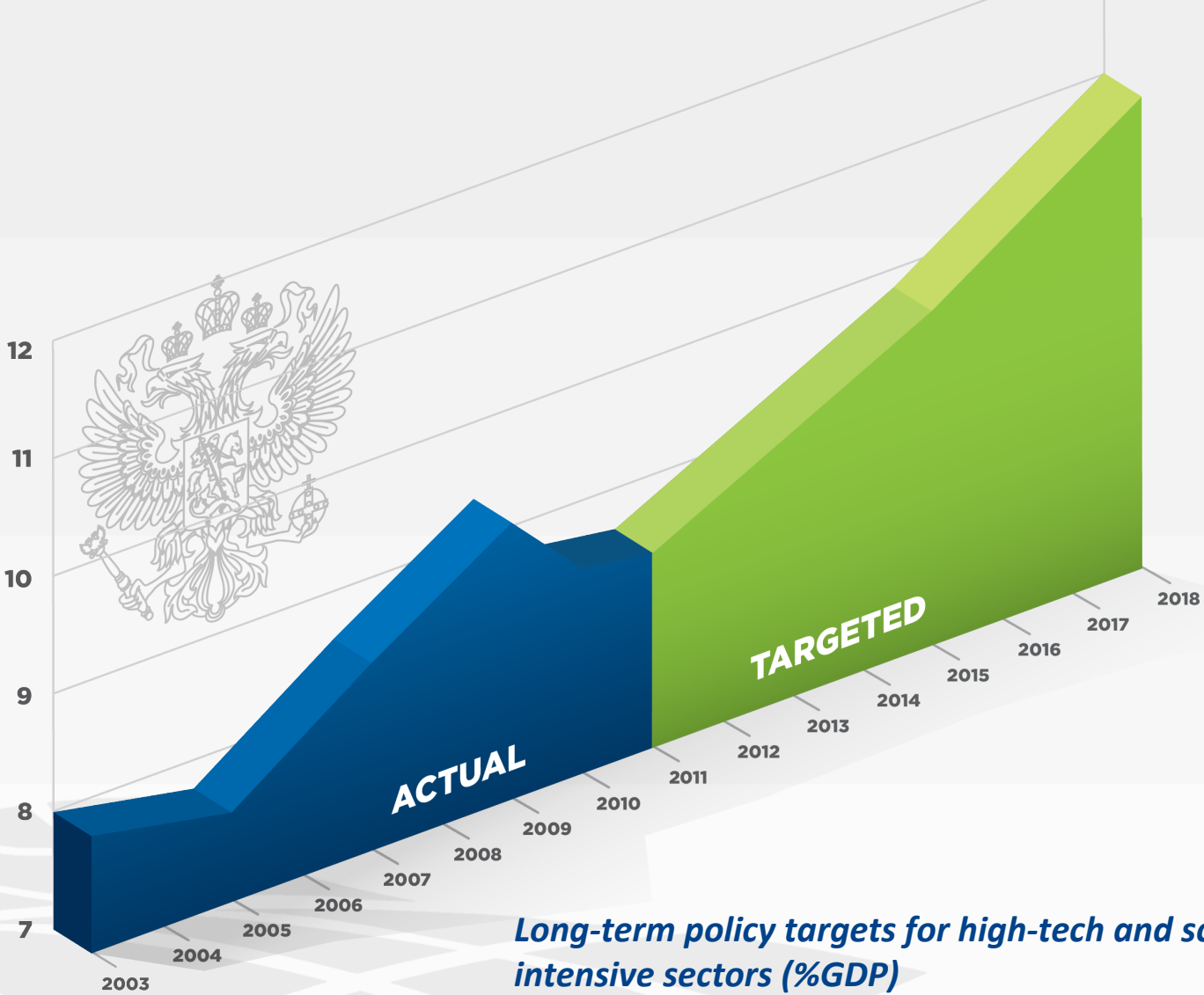


Background: Concept 2020

The Concept 2020 plan identifies the strategic role that technology plays in transforming the practices and processes that fuel economic growth and the development of business, industry and government.



Background 2020 Goals: High Tech Sector Growth



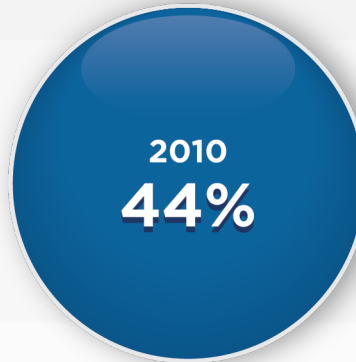
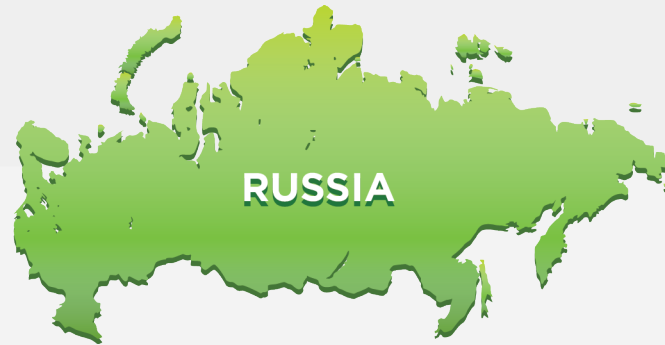
Long-term policy targets for high-tech and science-intensive sectors (%GDP)

The Russian IT Sector

A number of factors are inhibiting the growth of Russia's IT industry:

- Weak intellectual property rights, regulations, laws and advantages
- Insufficient collaboration between the Universities and the business sector
- Dependence on the government as a principle customer

Shortage of Qualified IT Specialists



% of Companies who report an acute shortage of IT specialists

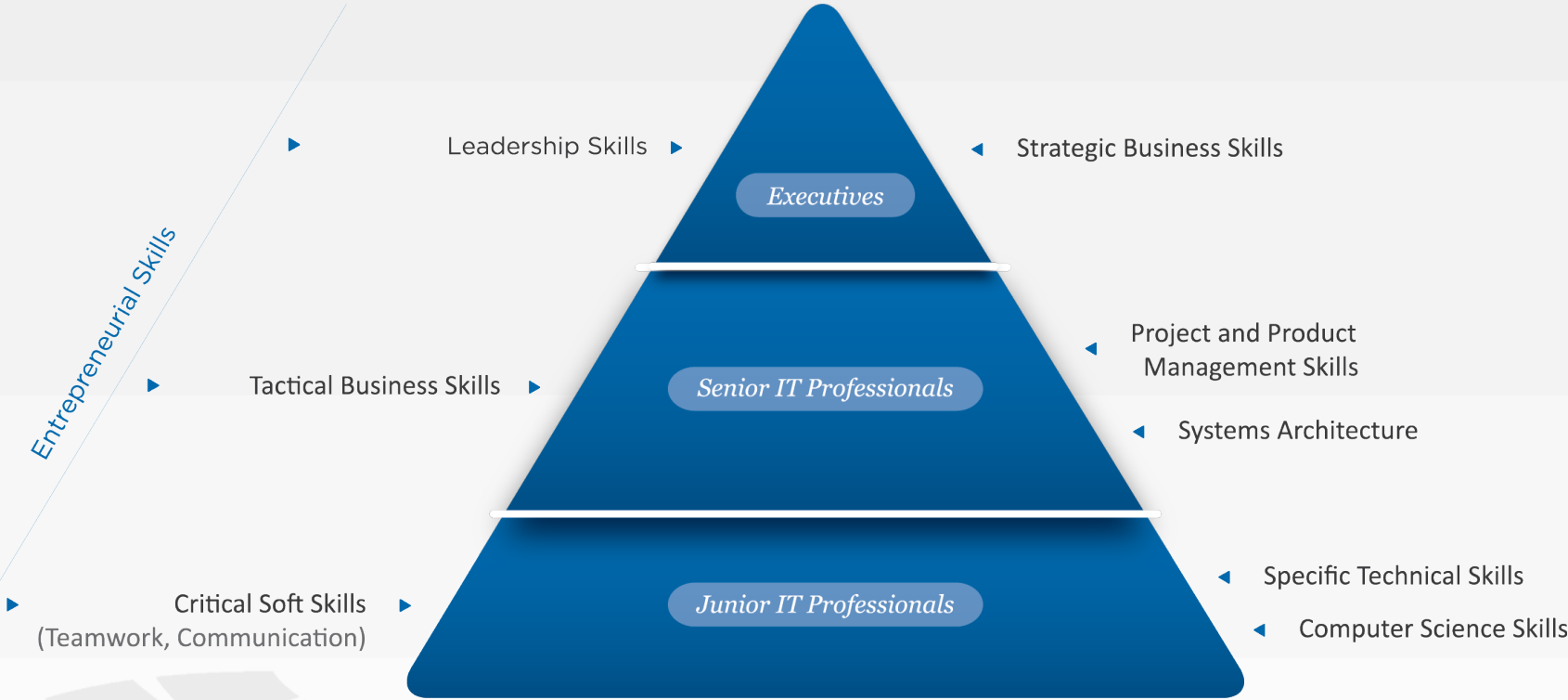
Assessment Study

CMU and iCarnegie were asked to conduct an industry and education assessment in the fall of 2012 focused on:

- Examine the strengths and weaknesses of current educational practices
- Examine the education system and its ability to meet the needs of the IT industry
- Identify the skills and competencies needed by Russian IT graduates
- Understand the social and cultural contexts in which programs will be embedded to ensure their success



Required IT Skills Across Industry



Assessment recommendations: What is Needed for Success



A number of steps must be taken by the government, industry and academia:

- Focus on the development of practical programs (academic and professional) that address industry's needs
- Build a robust research infrastructure of international caliber
- Create an innovation ecosystem including an IT park, an incubation/accelerator and the training to support it
- Create a pipeline of highly qualified STEM ready school students

Innopolis day 1



Innopolis City



Innopolis City Plan



Current state of construction



A Russian University with a Different Approach



- Degree programs tailored to the needs of the Russian IT industry, co-developed with professors of international caliber and local industry
- Professional non-degree programs that provide skill enhancement training for industry personnel in areas of IT management, IT entrepreneurship and technology strategy
- The curriculum will be distinguished by the following characteristics:
 - *practicality*
 - *project-orientation and industry-focused*
 - *focus on soft skills*
 - *flexibility*

Innopolis University at a Glance

IT/Computer Science focus:

- **5,000** students by **2020**
- **200** research projects per year by **2020**

Internationally recognized quality of education:

- Modern curricula adopted from global leaders in IT education
- World-renowned professionals as guest speakers

Emphasis on business needs:

- Learning by doing approach
- Entrepreneurship programs
- **200** entrepreneurs per year
- **5-10** successful start-ups per year

Hands-on experience Collaboration with industry partners:

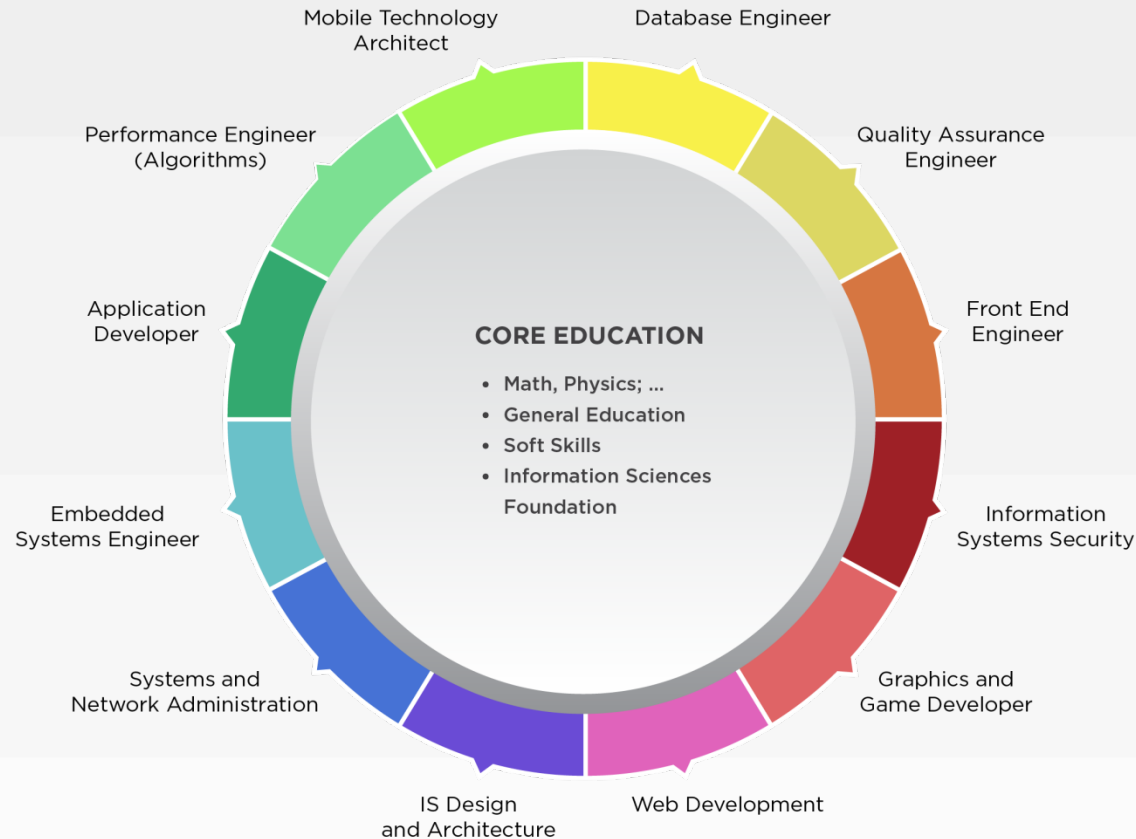
- Microsoft, Google, IBM, Intel, Boeing, Siemens, Yandex, Mail.ru, Kaspersky, ABBYY, Parallels, 1C, etc
- Practical assignments in companies: **2,000** trainee jobs per year by **2020**



Curriculum Development at Innopolis University

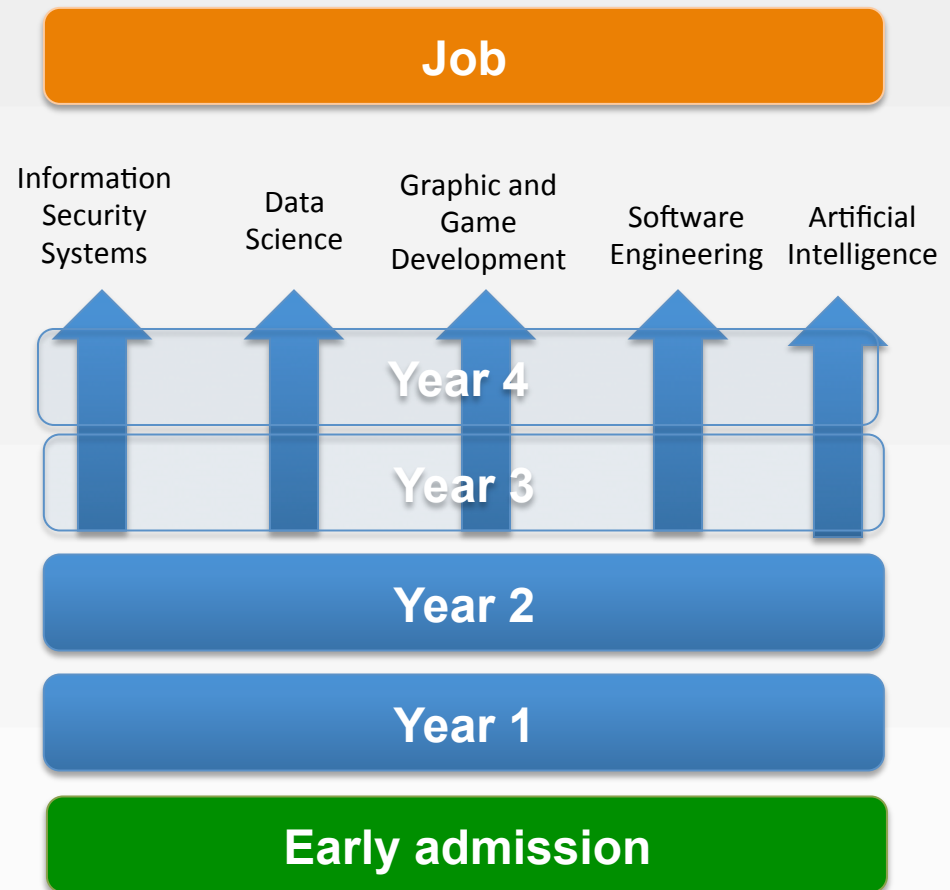
Four distinct bachelor's degree programs (out of 12 identified during the assessment) using a common core and four years of study are being designed:

- *Artificial Intelligence*
- *Software Engineering*
- *Information Security*
- *Data Science*
- *Graphics and Game Development*

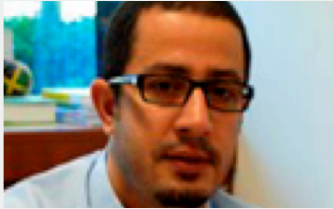


Curriculum Development at Innopolis University

- 2 years common core
- Strong math/science basis
- English as language of instruction
- Early admission – 24 month before graduation from high school
- Graduates ready for employment
- Strong connection with Industry
 - up to 31 weeks of internships in 4 years
 - collaborative development of the curriculum
 - Invited professors to teach electives
 - Professional programs



Innopolis University Faculty



Samir Belhaouari (Switzerland) H-index 11
Associate Professor PhD from EPF Lausanne. Research interests include pattern recognition in biomedicine and security systems, probability theory.



Manuel Mazzara (Italy) H-index 10
Associate Professor PhD from University of Bologna. Work experience as SE in Microsoft. Research interests include e-health social networks, software development.



David Vernon (Ireland) H-index 25
Visiting Professor Coordinator of the European Network for the Advancement of Artificial Cognitive Systems. Research interests include artificial intelligence, cognitive systems, robotics.



Bertrand Meyer (France) H-index 38
Visiting Professor Professor of Software Engineering at ETH Zurich, author of programming language Eiffel.



Eugene Zouev (Russia) H-index 6
Visiting Professor Software architect and compiler developer. Expert in programming languages.

Innopolis University Faculty



Joo Young Lee (Korea/USA)

Assistant Professor PhD'14 from Syracuse University, USA. Research interests Reputation management, social network analysis, machine learning, data mining. **Training in KAIST and Polytechnic of Milan, Fall 2014.**



Michele Mazzucco (Italy) H-index 10

Assistant Professor PhD'09 from Newcastle University, UK. Work experience as Capacity Planning Engineer in Demoware. Research interests include distributed data processing, queuing theory, stochastic optimization. **Training in ETH Zurich, Spring 2015.**



Joseph Brown (Canada)

Assistant Professor PhD'14 from University of Guelph, Canada. Research interests include artificial intelligence, genetic algorithms, manufacturing system analysis. **Training in IT University of Copenhagen, Fall 2014.**



Qiang Qu (China)

Assistant Professor PhD'14 from Aarhus University, Denmark. Research interests include query optimization, graph mining, large-scale datasets, social network analysis. **Training in ETH Zurich, Fall 2014.**



Adil Khan (Pakistan/Korea) H-index 9

Assistant Professor PhD'11 from Kyung Hee University, Korea. Research interests include machine learning, artificial intelligence, pattern recognition, data mining, mobile robots. **Training in Polytechnic of Milan, Spring 2015.**

Innopolis University Visiting Faculty



Rustam Ibrahimov (Russia) H-index 24

Visiting Professor Professor of Econometrics at Business School Imperial College, London. PhD Yale University, Associate Professor Harvard's Economic Department.



Salvatore Distefano (Italy) H-index 13

Visiting Professor Professor at Polytechnic of Milan. His research interests include performance evaluation, parallel and distributed computing, software engineering, and reliability techniques.



Max Talanov (Russia)

Professor of the Practice Software design architect at Fujitsu GDC Russia. Research interests include computational emotions, artificial cognition.

Innopolis University Consultants



David Parnas (Ireland, Canada)

Professor Emeritus, pioneer of Software Engineering. Best known for developing the concept of information hiding in modular programming – important element of object-oriented programming



Matthias Kaiserswerth (Switzerland, IBM)

Professor of Computer Science, Director and Vice President of IBM Research in Zurich. The lab has 4 Nobel price laureates, in 2013 Gordon Bell Prize.



Lynn Stein (USA, Olin College)

Professor of Computer Science and Engineering at Olin College, previously Associate Professor at MIT. Pioneered the development of a new and innovative approach to the teaching of CS.



Isak Froumin (Russia, HSE)

Professor of Education at HSE. Leading expert on university education. Winner of the RF Government Prize in Education in 2003 and in 2009. Advisor to the Minister of Education and Science of Russia Federation.

Bachelor Students



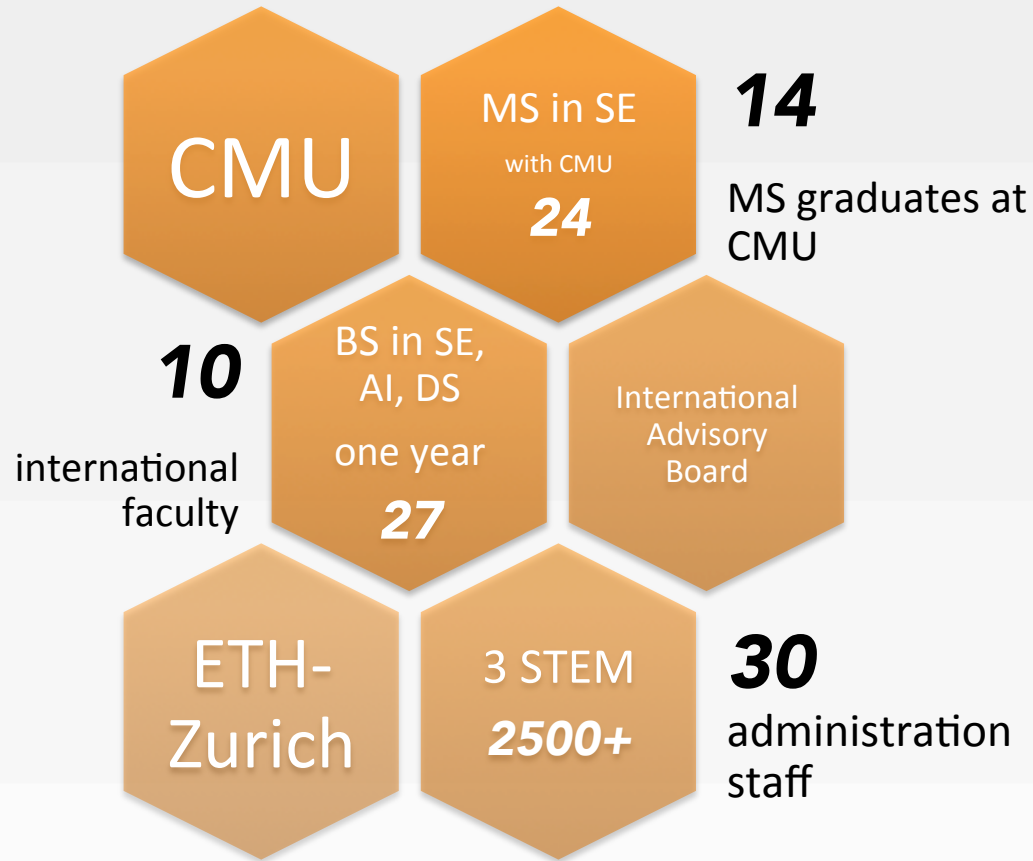
Master Students



STEM Robotics centers



Current State of Innopolis University



Plans for 2014-2016

- First year students in 2015
- A number of additional BS programs
- Dual MS degree with Carnegie Mellon in Software Engineering and in Robotics
- Extending partners to other top world Universities
- World Robot Olympiad
- Ershov Informatics Conference, 18-20 Aug 2014

ETH

Eidgenössische Technische Hochschule Zürich
Swiss Federal Institute of Technology Zurich

KIT

Karlsruher Institut für Technologie

MIPT
MOSCOW INSTITUTE
OF PHYSICS AND TECHNOLOGY

ITMO
STATE UNIVERSITY

KAN



**POLITECNICO
DI MILANO**

**Carnegie
Mellon
University**



**IT University
of Copenhagen**



KAIST
KOREA ADVANCED INSTITUTE OF SCIENCE AND TECHNOLOGY
한국과학기술원
SINCE 1971



UNIVERSITY OF AMSTERDAM

Conclusions

- Innopolis University is established as an IT academic resource in Russia addressing national economic needs and priorities
- The university will offer bachelor's degrees in several IT specialties, and a joint master's degree in Software Engineering and Robotics with Carnegie Mellon
- The university will use a practical 'learn-by-doing' approach to all of its programs with an emphasis on robust faculty training and the introduction of best practices and international accreditation



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We are open to cooperate!

