Big Data and Artificial Intelligence for Digital Humanities: an International Master Program via Trans-Eurasian Universities Network

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Abstract
This paper presents an intention of two Russian universities located at opposite sides of Russia to build with partners — leading world educational centers (in the Top-100 Universities of Times Higher Education) — a trans-Eurasian international network with Master’s program “Big Data and Artificial Intelligence for Digital Humanities.” This program significantly extends the area of fostering students’ talent. In addition, it allows students to develop valuable global skills of a contemporary professional: domain expertise, soft skills including creative and system thinking, self-development, working in an international and intercultural team on a research project, etc. After graduation, the alumni will have a wide choice of opportunities to continue their academic career or to get a well-paid job in developing and developed countries around the World.

Keywords: trans-Eurasian universities’ network; international Master’s program; digital humanities, skills of contemporary professional

In the worldwide trend of education internationalization and global communications, the funding and overwhelming support of double degree Master’s programs (DDMP) with leading educational centers has become a standing tradition among Russian universities over the last ten years. Starting in 2013, the “5-100-2020” Russian Academic Excellence Project has involved more than 20 leading Russian universities (“5-100” universities) with over 360,000 students [1], including Far Eastern Federal University (FEFU) and ITMO University (ITMO). Within this project, universities strive to achieve the position in the Top-100 World Ranking University, including Times Higher Education (THE) and QS. Hence the number of international Master’s programs has significantly grown. Today “5-100” Universities offer more, than 60 DDMP*. Most of these programs and the majority of programs outside Russia like [2] usually include one partner located not far from the main university (not more than 3000 miles to provide a high level of student’s mobility).

* http://magistratura.su/ (In Russian), sites of 5-100 universities
The team from ITMO and FEFU intends to build the network of universities located in the European Union (EU), Asia-Pacific Region (AP-Region), Russian Federation (Russia), and, potentially, India and other countries of the Indian Ocean.

Why ITMO and FEFU? We observe some advantages of the selection of these universities:

1. **Geographic position and logistics.** ITMO University is located next to the northwest edge of Russia (Saint-Petersburg) and FEFU – next to southeast edge (Vladivostok). Although the related cities are far from each other, many cheap flights connect these locations (350-400 USD for a two-ways ticket). It allows observing and following the most important trends, to make a research and develop projects in the spheres that are of great global importance.

2. **Achievements, partnership and facilities of both universities.**
   a. **ITMO University.** The campus of ITMO is located in Saint-Petersburg and its suburbs. Saint-Petersburg has 5, 2 million citizens, and it’s Leningrad Region forms a big “laboratory” for social, medical and other interdisciplinary research. This university has gained the experience in funding and implementing double degree programs in English with leading universities in EU, the USA, and other developed countries (including the University of Amsterdam [3]). ITMO is one of the leading school of programming and computational science (CS) in the World: it is a six-time champion in the ACM International Collegiate Programming Contest, and it has many years' experience to carry out scientific research including participation in international projects that include “The Kumbh Mela Experiment” [4], “Computing Patterns for High-Performance Multiscale Computing” [5]. In 2016 ITMO was included in THE: position between 351-400 in general and position “56” in “Computer Science.” Therefore, ITMO is one of the leading universities in computer science located in the well known touristic and business centers of Russia. The network includes Finland, the Netherlands, Poland, Greece, Hungary, Germany, Cyprus, the USA, India, Brazil, and Mexico.
   b. **FEFU.** The brand new campus [6] provides students with large classrooms and up-to-date research and development laboratories, top-class dormitories, and outstanding dining and sports facilities. FEFU is the only representative of Russia in the Association of Pacific Rim Universities (APRU). FEFU is the center of international education in the Russian Far East, and is actively integrating itself into global higher education and information environments. FEFU has developed partnership projects and academic exchange programs with approximately 100 universities. The network includes the USA, Japan, the People's Republic of China, the Republic of Korea, New Zealand, Taiwan, Australia, Thailand, India, and Vietnam.

3. **The synergetic effect is expected to be achieved by the combination of the two layers.** ITMO is an expert in IT technologies. Its expertise is in distant sounding, modern technical means for big data processing and visualization. While FEFU is an expert in complex Asia-Pacific Region studies including economics, politics, oriental languages, corpus linguistic, and many others. It can work with poorly formalized data that cannot be automated but require a profound content analysis, indicator system development. The collaboration of ITMO and FEFU can give the most comprehensive and complex understanding any data.

Both universities are centers of international education in its field, and are actively integrating into global higher education and information environments. They seek for new partnerships for global education development.

Within the network, we are going to design and implement an international double degree Master’s program: “Big Data and Artificial Intelligence for Digital Humanities.” This program encompasses
two partners: the University of Amsterdam (the Netherlands) and Tsinghua University (China). Both partners are included in the Top-100 universities of THE, thus making the academic alliance powerful and unique. The program is aimed at training professionals with skills in creative and system thinking; working in international and intercultural teams; identifying and solving poorly-formalized interdisciplinary and humanitarian problems; learning, designing, implementing ICT on the big data base, data mining, heuristics algorithms, image processing and analysis, high-performance computing, etc. in different areas of Digital Humanities. These skills are of great demand since most of real processes, especially in humanities, are complex, poorly-formalized, and require profound expertise.

The program involves students in research, teaching, and working on global projects in collaboration with experts from FEFU, ITMO, and their partners. The program offers more than 30 major and elective courses covering most contemporary areas of CS, Artificial Intelligence, and Informational Systems. Some of them are:

- Data Processing and Analysis in Humanities;
- Social Networks Simulation and Analysis;
- Web Data Mining;
- Interactive Visualization and Virtual Reality;
- Linguistic Ontologies;
- Human-Computer Interface in Intelligent Systems.

The alumni may continue in a relevant Ph.D. program or get a well-paid job in design and implementation of informational intelligent systems including decision support systems, or complex system simulation and design. In addition, the alumni may carry out data acquisition and hunting, promote and adopt informational systems, and specialize other spheres that are of great demand in Russia and among other countries participating in activities to solve poorly-formalized problems.

FEFU and ITMO will start the admission to the program in spring, 2018. The studies will begin in September, 2018. The enrollment to the program is competitive. An applicant should have a bachelor’s degree in the relevant area, and demonstrate proficiency in English (C1). The program requires an interdisciplinary exam. The first year of the program is carried out by FEFU and ITMO simultaneously. The second year allows a wide range of minors and electives offered by the four universities, and may offer a semester exchange program encouraging student mobility. After graduation, the alumni receive the state-recognized Master’s degree (FEFU or ITMO), and a degree from one of the two partners.

References