СИБИРСКИЙ ФЕДЕРАЛЬНЫЙ УНИВЕРСИТЕТ | SIBERIAN FEDERAL UNIVERSITY

ИНСТИТУТ КОСМИЧЕСКИХ И ИНФОРМАЦИОННЫХ ТЕХНОЛОГИЙ
INSTITUTE OF SPACE AND INFORMATION TECHNOLOGY

NEW

2021

Master Program Digital Intelligent Control Systems 09.04.01.12

The Program complies with European standards

Key facts

The Master's Program "Digital Intelligent Control Systems" is offered by the School of Space and Information Technologies of the Siberian Federal University.
The Program provides training in developing embedded intelligent control systems based on modern microprocessors, microcontrollers and programmable integrated circuits (FPGA, PLD).

Degree	M.Sc. in Computer Science
Duration	2 years
Study intensity	Full-time
Delivery mode	On campus
Credits	120 ECTS credits
Language	English

Expanding the scope of intelligent digital control systems is the mainstream of modern IT development.

Specialists in this area are constantly in demand in the labor market.

About the Program

The Master's Program is aimed at training experts in design, implementation and maintenance of control systems using modern electronic components and artificial intelligence technologies. The Program has been developed according to European educational standards.

Advanced teaching methods of leading European universities

Teaching aids and curriculum have been developed in collaboration with European universities such as:

✓Technical University of Berlin (Berlin, Germany),
✓Sorbonne University (Paris, France),
✓Thomas More University (Antwerp, Belgium),
✓Peter the Great University (St. Petersburg, Russia).

Highly qualified teachers

✓100% of the teaching staff have academic degrees.

✓Training project implementation is supported by engineers and tutors with practical experience.

The Department of Computer Science was founded in 1969.

We have been training experts in Computer Science and Information Technology for over 50 years.

In 2019, the Department was awarded the title "Gold Department of Russia".

Program Leader

Oleg Nepomnyashchiy

Ph.D. in Engineering, Professor,
Head of Computer Science Department, ISIT SibFU.
Google Scholar: https://scholar.google.com/citations?user=JxdeoasAAAAJ
CV : http://www.sfu-kras.ru/files/CV_Nepomnyashchiy_15012020.pdf
e-mail: ONepomnuashy@sfu-kras.ru

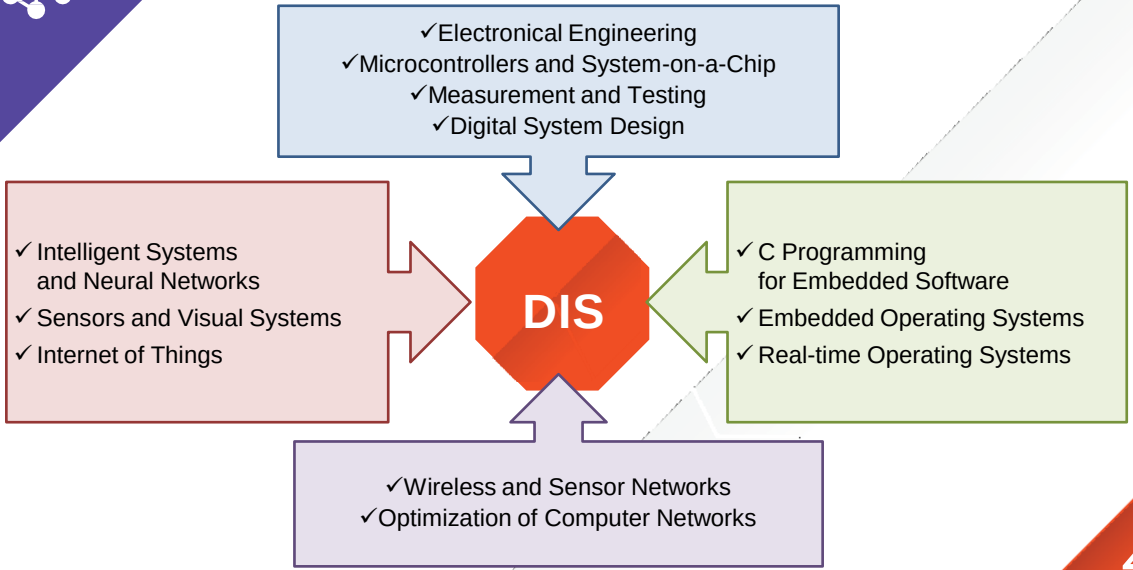
Area of expertise:

✓High-level design of VLSI circuit, Microprocessor systems, Measurement systems, CAD tools for VLSI and Systems on Chip design.

Coordinator and participant of the following Funded Projects:

✓"Applied curricula in space exploration and intelligent robotic systems (APPLE)" supported by EACEA Erasmus+ (2016-2020).
✓Development and debugging of a hardware-software simulator of an spacecraft onboard control complex (2017-2020).
✓Creation of high-tech production of modern angular satellite navigation equipment based on Russian microelectronic components of the system-on-chip class (2016-2017).
✓Development of the VLSI Class Architecture System-on-a-Chip for Creating a Goniometric Navigation Receiver (2015-2017).
✓Development of the multifunctional on-board control complex for a small spacecraft using a radiation-resistant element base (2014-2016) , etc.

Core courses



Facilities, Equipment and Software

Network equipment and communication systems of CISCO and D-Link

Well-equipped computer classes and laboratories, training robots and UAVs, 3D printers and 3D scanner

Laboratory and test equipment of the National Instruments

Lab benches, evaluation boards and starter kits of Intel and Microchip

The educational process is carried out in research and training laboratories:

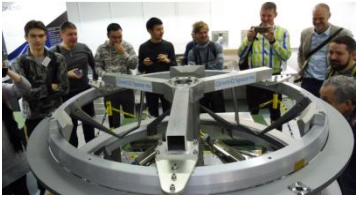
- ✓Microprocessor systems
- ✓Computer networks and telecommunications,
- ✓CAD systems,
- ✓Software development technologies.

Practice-oriented approach

✓***The Program implements team and project training.***

✓***Workshops, master classes and laboratory work are carried out in specialized laboratories.***

✓***Internships and practical training take place at enterprises.***



Training includes individual and group projects.

The Program covers entire life cycle of a software product or a hardware-software complex.

From idea, through modeling and prototyping to implementation.

International cooperation

For effective teamwork, extension of international relationships, exchange of experience, master's students can participate in international programs.

✓Each master's student can take distance or full-time study at one of the partner universities and receive the certificate.

✓The project team may include students and undergraduates from other countries.

Our partner universities:

✓Technical University of Berlin (Berlin, Germany)

✓Sorbonne University (Paris, France)

✓Thomas More University (Antwerp, Belgium)

✓Peter the Great University (St. Petersburg, Russia)

Technische Universität Berlin

THOMAS MORE University of Applied Sciences

ПОЛИТЕХ Санкт-Петербургский политехнический университет Петра Великого

UNIVERSITÉ PARIS SORBONNE PARIS IV

Research activity

The key form of training is research activity under the guidance of an experienced mentor – a scientific adviser, who, step by step, leads the masters student to the final exam.

Indicative work schedule:

✓**First month.** Select a research topic and agree with the supervisor and consultant the proposed scientific novelty of the research. Prepare an overview of related work, conduct a patent search, analyze known solutions.

✓**Second-third month.** Prepare the first chapter of the master's thesis. Formulate the research goal and tasks. Create a working group. Agree a work plan with an enterprise.

✓**Fourth-fifth month.** Design models, test key algorithms on a computer model. Prepare abstracts and reports for a conference. Prepare an application for registration of a intellectual property.

✓**Sixth-seventh month.** Write the second chapter of the master's thesis. Start software development ...

… ..And so on, step by step towards the final exam.

We train experts who stand at the intersection of science and industry.

Our graduates are ready to solve not only engineering problems, but, above all, the tasks of creating and managing science-intensive production processes.

Distance learning

✓In accordance with the specifics of the modern digital society, training is partially carried out in a distance format.

✓SibFU provides the developed electronic educational environment.

✓Laboratory work is carried out in laboratories under the guidance of a teacher and tutor.

✓Our department provides online access to a part of laboratory equipment, which allows you to carry out laboratory and independent work remotely.

✓Home assignments, project defense, scientific seminars and communication with the research supervisor, the tutor and the head of the master's program can be carried out remotely through the electronic educational environment.

✓This makes it possible to manage your time and develop an individual work plan for the project, including additional training and professional development.

Remote access to lecture notes, guides teaching materials and equipment saves you time.

Operational interaction with the working group is carried out through the project repository.

Learning outcomes

Upon completion of this program, students are expected to be able to:

✓develop software and hardware systems using the LabView design environment (© National Instruments),

✓create efficient FPGA designs using hardware description languages Verilog and VHDL, professional CAD Quartus (© Intel),

✓design built-in intelligent control systems for executive automation based on microprocessors and microcontrollers,

✓design, validate and test systems on a chip,

✓implement circuit solutions for interfacing intelligent digital systems with sensor systems and executive automation,

✓develop software for intelligent control systems in C and assembler.

Professional practical experience, teamwork skills and international certifications guarantee employment in leading companies.

The research orientation of master's theses, scientific publications and patents guarantee admission to post graduate.

Admission

- ✓Fill in online application form: http://forms.sfu-kras.ru/application-form?language=en&program=&course=
- ✓Attach a copy of THE FIRST PAGE of your international passport in color and of a good quality. The passport should be valid for at least 18 months after the prospective starting date of your studies.
- ✓After receiving your application form the International Students Recruitment Office will send you the Learning Agreement with terms and conditions.
- ✓Sign it and email its scanned copy back to the International Students Recruitment Office at admission@sfu-kras.ru.
- ✓The Invitation Letter which is necessary for you to receive the Russian visa, will be issued by the Krasnoyarsk Visa and Immigration Office within 30-45 days.
- ✓You will receive the notification that the document is ready from the International Cooperation Department, SibFU. The invitation letter will be sent to you by email.

International Students Recruitment Office (ISRO)
e-mail: admission@sfu-kras.ru
phone: +7 391 206-27-79 phone (WhatsApp, Viber): +7 950 971-22-06
address: 82A Svobodny pr., Office 4-47, 660041 Krasnoyarsk, Russia

The background of an applicant in IT is important, but it is not the main condition for successful training. Motivation and willingness to learn are more important than previous academic grades. If a student wants to become a professional, our teachers are ready to provide comprehensive support. Joint efforts of a qualified teaching staff and a motivated student guarantee a high result.

Contacts

Address: 660074, Krasnoyarsk, st. Kirensky, 26, office. ULK 1-04
Department: office. ULK 3-17
Reception phone: +7 (391) 291-22-93
Department phone: +7 (391) 249-75-61
E-mail: ikit-bs@sfu-kras.ru
Institute website: http://pkikit.sfu-kras.ru
Department website http://vt.ikit.sfu-kras.ru/

Pre-registration for the master's program 09.04.01.12 DIS by QR code