

11.04.02

INFOCOMMUNICATION TECHNOLOGIES AND COMMUNICATION SYSTEMS

Media Technologies and TV-Radio Broadcasting

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FIELD OF STUDY (CODE, TITLE)

11.04.02
Infocommunication technologies
and communication systems

TITLE OF THE ACADEMIC PROGRAMME

Media Technologies and TV-Radio
Broadcasting

DEGREE LEVEL

Master's degree

DURATION OF STUDY

2 years

PROGRAMME DESCRIPTION

In addition to audiovisual equipment and digital television, in their classical sense, the master's programme includes all modern aspects of encoding and media data transition media via the Internet, mobile operator networks, wireless and IP networks. The programme is aimed at in-depth training of specialists in the field of formation, coding, transmission, and distribution of digital television and audio broadcasting programmes. Specific attention is paid to the DVB-T2 standard, issues of media broadcasting in standard, high and ultra-high definition over terrestrial, satellite, IP networks. The programme also focuses on interactive media broadcasting systems, Internet broadcasting, and channelling equipment. The programme also includes disciplines aimed at developing of media products production skills: working with professional video

equipment to obtain video and audio materials, and their subsequent editing.

Additionally, among the topics covered are the issues of: video streams intelligent processing with the use of computer vision algorithms; concert and theatre venues media support with the use of generative graphics and 3D technologies; formation and transmission of video data in panoramic video (360°); and virtual and mixed reality systems.

The programme also focuses on issues of: national and international radio frequency resources use regulation; electromagnetic compatibility of radio electronic means; assessment of transmitter maintenance areas; measurement of transmitter radiation parameters that affect electromagnetic compatibility; and algorithms of radio radiation sources location tracking.

MAIN ACADEMIC COURSES

- Media Content Transmission in a Digital Distribution Environment
- Video Content Compression and Quality Assessment Technologies
- Colour Management in Media Technologies
- Generation Graphics Design
- Artificial Intelligence in the Media Industry
- Reality Visualisation Technologies
- Digital Television Systems
- Digital Broadcasting Systems, Technologies and Networks
- Generation, Storage and Reproduction of Audio Content in Media Systems
- Sound Effects
- Regulation and Monitoring of RF Resource Use



ADVANTAGES OF STUDY

The programme is designed to train highly qualified specialists in digital broadcasting and media technologies. Their proficiency level enables them to work both in new technologies and digital broadcasting equipment development, and in operation of complex hardware and software systems that create, encode and transmit media content.



Classes are held in specialised laboratories equipped with the necessary facilities



The Scientific and Research Laboratory “Radiocontol and Electromagnetic Compatibility” has developed fixed, mobile, and wearable radio engineering complexes that enable to monitor radio frequency resource and carry out measurements on the territory of telecom operators in places where radio transmitters are installed.



Laboratory and practical classes are also held in the scientific and educational centre ‘Media Centre’ equipped with the cutting-edge digital television equipment, a television studio, a recording studio and a radio studio.



Master’s students are provided with the opportunity to: work in the educational and research laboratory of Digital Broadcasting Department of the state company ‘Russian Television and Radio Broadcasting Network’ in St Petersburg State University of Telecommunication; and do internships at television centres and leading television and radio companies in Russia.



OUTSTANDING PROFESSORS



Aleksandr Buchatskii

PhD in Engineering, Associate Professor, Associate Professor in the Department of Television and Metrology, Director of the Institute of Master’s Degree

He is the organiser of targeted training for the state-owned company ‘Russian Television and Radio Broadcasting Network’, a prize-winner of the St Petersburg Government Prize in the field of integration of education, science and industry.

COURSE

- Video Content Compression and Quality Assessment Technologies



Boris Antipin

PhD, Associate Professor, Associate Professor in the Department of Television and Metrology, Head of Scientific and Research Laboratory “Radiocontol and Electromagnetic Compatibility”

“Master of communication” (certificate № 2554 dated 03.03.2014), IEEE member (affiliate 94089900)

COURSE

- Regulation and Monitoring of RF Resource Use



Sergei Fedorov

PhD, Associate Professor

COURSE

- Architecture of Digital Television and Audio Distribution Networks



Dmitrii Tatarenkov

Assistant Professor

COURSE

- Methods of Intellectual Analysis of Media data, Virtual and Augmented Reality in Video Information Systems Analysis



Darío Alfonso Pérez Calderón Rodríguez

PhD, Assistant Professor

COURSE

- Single-Frequency Network



Evgeniia Tumanova

PhD, Assistant Professor

COURSE

- Immersive Visualisation Technologies

MAIN AREAS OF RESEARCH

1. Data compression techniques for the transmission of media content in a digital distribution environment
2. Methods to improve data transfer efficiency in DVB-T2 systems
3. Methods of objects in an image detection and recognition
4. Methods of media content transmission quality assessments
1. The use of artificial intelligence algorithms in digital image processing tasks when creating a diver assistance system
2. Augmented and virtual reality systems
3. Immersive sound systems
4. Broadcast transmitters maintenance areas assessment.
5. Assessment of electromagnetic compatibility of radioelectronic means based on spectrum monitoring.

INTERNSHIP AND CAREER OPPORTUNITIES

If the master's thesis is successfully defended, graduates can apply for employment in leading enterprises engaged in the development and operation of TV equipment for various purposes, the preparation and transmission of audiovisual content:



- FSUE RTRS
- PJSC Rostelecom
- Gazprom Transgaz St Petersburg LLC (Communications Department)
- NIIT Ltd
- EVS LLC
- Branch of SDB 'Energiya' of 'Energiya Factory' Ltd
- SDP 'Device'
- PJSC TV and Radio Company 'St. Petersburg'
- PJSC MTT
- SRC Neptune Ltd
- OJSC Mobile TeleSystems
- OJSC MegaFon
- Special Technology Centre LLC, etc.

ENROLLMENT TESTS

Enrollment tests are held in the form of an interview and contain an assessment of the applicant's knowledge in the following disciplines:

- Physical Basis of Video Content Formation
- Digital Video Information Systems
- Basics of Construction and Research of Terrestrial Digital Television and Radio Broadcasting Systems
- Technical Operation of Television and Radio Broadcasting Facilities
- Acoustic Basics of Broadcasting
- Formation and Processing of Primary Audio Signals
- Sound Broadcasting



THE CONTENT OF THE PROGRAM OF THE ENROLLMENT TESTS

Technical Operation of Television and Radio Broadcasting Facilities

1. Methods of Signal Modulation in Digital Satellite and Cable Television Systems.
2. DVB-S/S2/C/C2 Standards.
3. TV centers: classification, structure, equipment.
4. Processing of Television Signals on the Transmitting Side (hardware and studio complex).

Video Information Coding Standards.

Basics of construction and research of terrestrial digital broadcasting systems

1. Methods of Building Terrestrial Digital Television Systems.
2. Methods for the Formation, Transmission and Reception of Terrestrial Digital Television Signals.
3. Methods of Modulation of Terrestrial Digital Television Signals.
4. DVB-T2 Standard, Single Frequency Networks.

Digital Video Information Systems

1. Solid-state Light-to-Signal Converters: types, principle of operation, performance characteristics.
2. Solid-state Signal-to-Light Converters: types, principle of operation, performance characteristics.
3. Digital Representation of the Television Signal.
4. Redundancy of Television Signals. Methods of Eliminating Redundancy.



Physical Basis for the Formation of Video Content

1. Principles of Video Content Formation
2. TV Signal
3. Image Quality Assessment



Sound Broadcast

1. Digital Representation of Audio Signals
2. Compression of Digital Audio Data
3. Acoustic processes in Enclosed Spaces
4. Sound Absorption and Sound Insulation
5. Acoustics of Concert and Lecture Halls, Recording Studios and Control Rooms
6. Sounding of Rooms and Open Spaces
7. Acoustic Quality of Recording and Listening Rooms



Formation and Processing of Primary Audio Signals

1. Typical Devices for Processing Audio Signals
2. Frequency Processing of Audio Signals
3. Dynamic Audio Signal Processing
4. Sound Effects Devices
5. Sound Recorders



Acoustic Fundamentals of Broadcasting

1. Sound Field
2. Sound Emission
3. The Structure of the Human Auditory System
4. Basic Properties of Hearing
5. Spatial Hearing



You are welcome to ask any questions that may arise within the interview