

Network Science



What is Network Science?

Network science is a scientific field that studies complex networks (such as communication networks, including the Internet, telecommunications and computer networks, social networks, cognitive and semantic networks), as well as various aspects of information and communication services in a networked environment.

It is an interdisciplinary field that, in addition to technical aspects, explores the physical, social, and economic phenomena of interconnecting people, computers, devices and things. With the constant development of communication networks and distributed systems, network science has become one of the most propulsive areas, affecting the overall technological, social and economic development.

Competencies

Students will gain theoretical and practical knowledge and skills necessary for the research, development, and implementation of networks, systems and services, with an emphasis on identifying, formulating and solving complex problems in the fields of communication networks, distributed systems, and networked services. They will study models and the implementation of local, access, and core networks, multi-service, intelligent, broadband networks and the Internet, network and information traffic planning and optimization, and network management.

Career

Potential employers include:

- ICT companies (Ericsson Nikola Tesla, Nokia Solutions and Networks),
- Public telecommunication networks (HT-Hrvatski telekom, A1, TELE2, and other operators),
- Medium and small ICT companies (Visage Technologies AB, Degordian, CROZ, Five, GDi ...),
- Business and private networks, networked systems (HEP),
- Academic, teaching, and state institutions (universities and scientific institutes, CARNET, Srce, the Croatian Regulatory Authority for Network Industries - HAKOM).



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Research Laboratories

You will have the opportunity to conduct your graduate research in the following research laboratories:

Laboratory for Assistive Technologies and Alternative and Augmentative Communication (ICT-AAC, <http://lab.ict-aac.hr>)

- new technologies, accessibility, serious games, education and communication

Social Networking and Computing Laboratory

(socialLAB, <http://sociallab.fer.hr>)

- data science, network science, social networks, electric vehicles, software for connected vehicles

Laboratory for Experimental Network Technologies

(NXLab, <http://www.nxlab.fer.hr>)

- networks, protocols, security, FPGA

Internet of Things Laboratory

(IoTLab, <http://www.iot.fer.hr>)

- networked devices and smart environments (cities, homes, agriculture), IoT platforms, Arduino, Raspberry PI, Waspote

Multimedia Quality of Experience Research Laboratory

(MUEXLab, <http://muexlab.fer.hr>)

- Quality of Experience, multimedia and communication services, QoE optimization techniques, video streaming, virtual and augmented reality, networked games

Human-Oriented Technologies Laboratory

(HOTLab, <http://hotlab.fer.hr>)

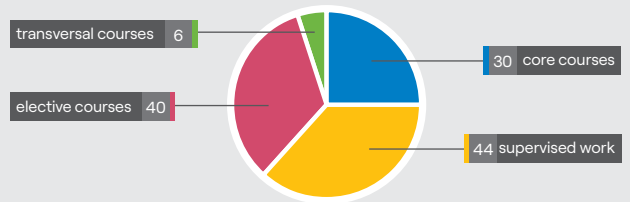
- computer vision, computer graphics, face and gaze tracking, augmented reality, machine learning

Data Stream Laboratory

(StreamsLab, <http://streamslab.fer.hr>)

- data streams, big data, distributed systems, machine learning, fast data

PLAN OF STUDY	SEMESTER	ECTS
Core courses		15
Advanced Algorithms and Data Structures	1	5
Communication Protocols	1	5
Distributed Systems	1	5
Seminar 1	1	3
Seminar 2	2	3
Research seminar	3	5
Project	3	3
Diploma thesis	4	30
Core elective courses		15
Network performance and traffic	2	5
Communication Security	2	5
Multimedia Communications	2	5
Complex networks	3	5
Network and Distributed Systems Reliability	3	5
Elective courses recommended for the profile	1, 2, 3	20
Elective courses	1, 2, 3	25
Transversal courses	1, 2, 3	6



Our lives today depend on networking. It is important to know and to understand networking concepts. Everything that is being developed and contains information is networked. Knowledge of networking technologies is considered a necessary prerequisite for career development in an industrial environment.

Darko Huljenic, PhD

Director of Research Unit, Ericsson Nikola Tesla



Working on MIT's projects involving the research of social networks (Twitter and Flickr), I used the knowledge of complex networks that can now be acquired within the Network Science profile. I am currently working on projects dealing with urban agriculture, where competencies in networks and networking are extremely important.

Iva Bojic, PhD

research scientist, Singapore-MIT Alliance for Research and Technology, Singapore



Networks have penetrated all aspects of modern world and there have never been more opportunities for them than now. However, the market is also more competitive than ever, which is why the study of network sciences is extremely valuable for anyone who wants to work with network technologies.

Daniel Ackermann, MSc

CEO and Co-Founder at Degordian