

Data Science



What is data science?

Data science uses scientific methods, algorithms and systems to extract knowledge and insights from structured and unstructured data. It includes data acquisition, maintaining, processing, analysis, and communication.

Area of study within data science

Data science is a wide and interdisciplinary area that includes various research areas and domain expertise, such as mathematics, statistics, computer science, artificial intelligence, machine learning, data mining, signal processing, natural language processing, bioinformatics, computer vision, distributed and parallel systems, databases, information visualization, and complex networks. Data science includes big data, deep learning, and high-performance computing.

Skills

- Design and implementation of artificial intelligence systems.
- Descriptive and inferential statistical data analysis.
- Application of machine learning algorithms for solving problems in various application domains.
- Acquisition of data from various sources.
- Data processing and analysis for solving problems in various application domains.
- Data visualization using programming tools.
- Use of computing infrastructure for efficient data analysis.

Career

Data science professionals are engineers with high-level technical skills, who are capable of building complex quantitative algorithms to organize and analyze large amounts of information in numerous application areas. Graduated engineers are in high demand for industry positions such as:

- data scientist,
- machine-learning scientist,
- data analyst,
- data engineer,
- business analyst,
- computer system analyst.

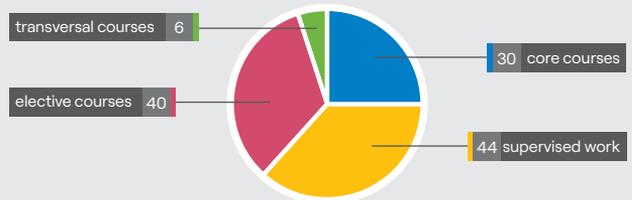


Data science profile

The Data science profile provides students with strong foundations in mathematics and statistics courses that are prerequisites for a deep understanding of the nature of data and strategies for data analysis. The strong foundations are further expanded with numerous elective courses, providing students a deeper knowledge about data science theory and its applications in various areas (e.g. industry, agriculture, finances, biology, medicine, traffic, business analytics, and social sciences). An increasingly growing amount of available data gives rise to the importance of the data science field and high industry demand for data science experts. The Data science profile is a part of the computing study programme, since computers and their complex architectures are a basis for data analysis and storage. A rich set of elective courses encourages students to explore other areas of the computing study programme, in order to achieve the desired knowledge profile required of the future Master of Computing degree.

| PLAN OF STUDY | SEMESTER | ECTS |
|---|----------|------|
| Core courses | | 30 |
| Statistical data analysis * | 1 | 5 |
| Introduction to data science * | 1 | 5 |
| Fundamentals of signal processing | 1 | 5 |
| Machine learning 1 | 1 | 5 |
| Seminar I | 1 | 3 |
| Multivariate data analysis | 2 | 5 |
| Seminar II | 2 | 3 |
| Advanced algorithms and data structures | 3 | 5 |
| Seminar II | 3 | 5 |
| Project | 3 | 3 |
| Final project | 3 | 30 |
| Elective courses recommended for the profile | 2, 3 | 25 |
| Elective courses | 1, 2, 3 | 15 |
| Transversal courses | 1, 2, 3 | 6 |

* the course is also offered at the undergraduate level (if the course is passed at the undergraduate level, it can be replaced by the Elective course recommended for the profile)



EU project DATACROSS coordinated by the Scientific center for research excellence in data science and advanced cooperative systems opens numerous opportunities for research and development in collaboration with industry in the inter-disciplinary area of data science.



The Data science profile is the right choice for students who plan to work in a scientific research environment. As a doctoral student, I apply the gained knowledge in my everyday work in biomedical image processing and analysis research.

Ivana Zadro
doctoral student at FER



Knowledge and experience gained during my master studies at FER opened the way for serious work in data science. Today, I lead a great engineering team and solve challenging world-class problems.

Matija Ilijaš
AI Research & Development director,
Microblink d.o.o.