

Big Data

Big data offers opportunities and risks, and it requires deep technical knowledge as well as critical skills to analyse the quality and impact of any approach or solution. Making sense of data is a key interdisciplinary challenge for many organisations, institutions and governments so they can understand and adapt quickly to changing conditions. For instance, a hospital can incorporate GPS data about the location of its ambulances and helicopters with data about the mission, the emergency calls, and the current status in various emergency rooms in order to take decisions in real-time when faced with an emergency call. Or for instance, step counters and mobile phones can be connected with Amazon Echo voice-activated assistant to help manage family life while potentially allowing a range of vendors to ensure availability of groceries and other products the family might need. While both these scenarios evoke a future of efficiency and convenience, they also raise issues about privacy and the influence such data services might have on work practices and everyday lives.

Extracting value from big data depends in part on solving engineering challenges and hiring data scientists, but the key lies in interdisciplinary and critical analyses of big data processes and solutions. The courses in this specialisation offer an opportunity for you to engage with technical challenges, organisational processes and societal concerns around big data. Most importantly, you will learn how to translate critical and theoretical tools you have gained throughout the program into practice and application.

Spring Semester:

Big Data Processes (7,5 ECTS)

Business, governmental and non-governmental organisations increasingly rely on big data to shape data-driven processes. Such big data processes, based on the discovery of meaningful patterns in data, can be used to analyse complex phenomena or to build predictive models. In this class, we will review the technological trends that underlie the advent of big data more generally. We will discuss the potentials of big data processes and their limitations from technical, ethical

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and organisational points of view, especially in the cases where personal data is involved. You will learn basic hands-on analytics approaches using Tableau Public.

Autumn Semester:

Critical Big Data Management (15 ECTS)

There is no longer one approach that fits all data management problems. For each problem, IT specialists have to decide on appropriate models and systems to handle the relevant data. In this course, we will address the critical issues that emerge in collecting, managing, processing and analysing large-scale data. We will discuss modern approaches to organising and making sense of large data sets. We will cover the principles of big data analysis and illustrate a group-based hands-on approach to big data modelling and management while addressing the increasingly important societal issues these principles and approaches address and problematize. You will be introduced to basic quantitative methods and technical skills to be able to assess current approaches to big data management and analytics as well as critical theoretical tools for identification and discussion of potential pitfalls, obstacles and opportunities that working with data and analytics may bring up.

This course run in parallel with a Technical Big Data Management course on the Computer Science program and you are expected to work in cross-program groups on the three projects that make up the core of the course. The goal is to create an experience where you must negotiate disparate backgrounds and technical expertise to achieve common goals.