

Big Data

Big data offers opportunities and risks, requiring 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 organizations, institutions and governments so that they can understand and adapt quickly to changing conditions. A hospital could incorporate GPS data about the actual location of its ambulances and helicopters with data about the mission these vehicles are involved in, as well as the emergency calls and current status in various emergency rooms in order to take decisions in real-time when faced with an emergency call (also in the face of large-scale disasters). 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 in-store availability of groceries and other staples the family might need when they need it. 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 specialization offer an opportunity for students to engage with technical challenges, organizational processes and societal concerns around big data. Most importantly, students will learn how to translate critical and theoretical tools they have gained throughout the program into practice and application.

Spring Semester:

Big Data Processes

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

Autumn Semester:

Critical Big Data Management

There is no longer one approach that can fit 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 the course of collection, management, processing and analytics of large-scale data. We will discuss modern approaches to organizing 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 modeling and management while addressing the increasingly important societal issues these principles and approaches address and problematize. Students 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 is run in parallel with a Technical Big Data Management course on the Software Development Masters program and students 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 students must negotiate disparate backgrounds and technical expertise to achieve common goals.