Lecture, Course and Project Descriptions

This document contains lecture, course and project descriptions offered in English language by the Institute of Information Studies (IWS) at the Faculty of Information and Communication Studies. These descriptions consist of a brief list of course content as well as the intended learning outcomes. Additionally, the credits, the frequency and the instructor’s name are indicated.
Bachelor: Data and Information Science

No: 17.1
Name: Search Engine Technology
Terms: Winter Semester (starts for the first time in October 2020)
Credits: 3
Instructor: Prof. Dr. Philipp Schaer

Learning outcomes
(WHAT) Students can set up their own search engine for a given, (semi-)structured data set, configure it and adapt it to different requirements. They analyze the performance of the systems and their components in order to identify and implement potential for improvement.
(HOW) With the help of standard software libraries such as Solr and trec_eval, the own search engine is installed, configured and extended.
(WHY) Later, students will be able to use the tools and processes for any data and applications (e.g. intranet, websites, product catalogs or e.g. log data).

Contents
Students will learn how to set up a typical search engine installation and how to prepare and perform indexing with standard software such as Solr, Elasticsearch etc. The students will also learn how to use a search engine indexing tool. In addition to a search index and interface, these software packages also provide extensive REST interfaces. After the successful indexing of any data set, the focus is on the processing of multiple queries with shell scripts or small Python programs. Later, the search engine will be configured and extended. The evaluation of the results according to the cranfield paradigm is practiced prototypically using a test collection.
No: 08.1
Name: Data Modeling
Terms: Summer Semester (starts for the first time in April 2019)
Credits: 6
Instructor: Prof. Dr. Philipp Schaer

Learning outcomes

(WHAT) Students learn to process and structure data and information that is available in electronic form and to convert it into common formats.

(HOW) For this they use different formats (e.g. CSV, XML or JSON), automated transformations (e.g. with XSLT or on the command line) and editors (e.g. Notepad++).

(WHY) This enables them to process any source data in such a way that it can be used for later applications, e.g. as input for database and retrieval systems or for data mining. They know typical procedures, tools and formats to use the results of their preparation and modelling flexibly. Furthermore, they can adapt them according to the application and requirements.

Contents

In this course, procedures, tools and formats for the preparation, structuring and transformation of arbitrary data and information are presented and their practical use in laboratory practical courses are practiced. The focus is on the various steps necessary to bring any digital data and information into a uniform form and to enable structured further processing. Furthermore, methods for the automated transformation of data (e.g. with regular expressions, XSLT or small scripts) into various formats (e.g. CSV, XML, JSON) using text editors (e.g. Notepad++) are discussed. In addition to the theoretical basics of data structures (lists, trees, etc.), practical skills in the different types of data and information retrieval from the Web (databases, Web APIs, scraping) and data cleansing (consistency checks, harmonization, etc.) are taught. A series of experimental (e.g. OXPath) as well as methods and tools already in professional use will be presented and evaluated using practical examples.
No: 15
Name: Information Analysis
Terms: Winter Semester (starts for the first time in October 2019)
Credits: 6
Instructor: Prof. Ragna Seidl-de Alwis, MBA

Learning outcomes

(WHAT) Students learn to identify strengths and weaknesses of markets and companies /organizations

(HOW) with the help of secondary sources and the use of dynamic and elaborated research techniques by studying methods and techniques of information analysis with a strong practical orientation

(WHY) to identify and analyze possible challenges and risks for companies & organizations & markets & industries and corresponding trends

Contents

- Systematic survey and evaluation of secondary sources (data and information sources)
- Research methods of market & industry data and company information including refinement, analysis and interpretation
- Success factors of in depth information analysis
- Facts and figures for a first market & competitive analysis
Learning outcomes

In this course, the basics and techniques for the evaluation of large amounts of data are taught. In addition to their size, these data sets are characterized by four additional features: high variability, steady and massive growth, poor data quality and high complexity. The techniques and methods necessary for the analysis are taught to students in this module.

(WHAT) The students will become enabled technically to understand the characteristics, potentials and risks of big data and to carry out a systematic planning and implementation of the analysis of mass data under specific economic as well as scientific questions,

(HOW) by understanding Big Data architectures in their construction, understanding and using NoSQL databases for semi-structured data as well as preprocess, cleanse and transform data and understand, apply and optimize analyzing methods such as neural networks as well as analyze real, large datasets, visualize and interpret results and report to stakeholders,

(WHY) for delivering insights gained from extensive analyzes and results models, deriving recommendations for action and preparing for decisions makers.

Contents

- Big Data Analytics - Basics
  - Characteristics
  - Risks and potentials of Big Data
  - Use cases and applications
- Big Data Analytics – methods and architectures
  - Setup of Big Data architectures
  - SQL and NoSQL co-existence
  - Coupling analysis and star / snow flake schemes
  - Data preparation, cleansing and transformation
  - Basics of neural networks and deep learning for optimization
- Big Data Analytics – applications
  - Analysis of real data sets and working on real world problems
  - Validation and deployment
  - Advanced visualization techniques
No: 23b
Name: Market and Business Intelligence
Terms: Summer Semester (starts for the first time in April 2021)
Credits: 6
Instructor: Prof. Dr. Gernot Heisenberg, Prof. Ragna Seidler-de Alwis, MBA

Learning outcomes
The students are enabled to apply the knowledge acquired in the lectures, in order to further develop their competencies in the area of Market & Business Intelligence.

(WHAT) The students are technically enabled to carry out a systematic survey and analysis of data and information under market and competition aspects. That concludes extensive knowledge of relevant data and information sources. They can identify peculiarities in large amounts of data from corporate and market data, which are used for the pioneering role of a company in a specific market segment,

(HOW) by applying methods and tools of market and competitive analysis, including demanding data and information searches and by statistically analyzing, validating and optimizing (mostly non-hypothesized) data volumes as well as new unknown market and company data,

(WHY) in order to use the extensive analyzes and results models forecasts for market success derive, scrutinize and question them and use the findings as a basis for decision-making (e.g. Investment decision support for the management) and to derive trends.

Contents
- Market analysis including methods and models
- Competition analysis including methods and models
- Knowledge Management and Business Intelligence basics
- Cross Industry Standard Process for Data Mining (CRISP-DM )
- Data selection
- Data preparation
- Predictive Analytics methods
- Modeling, validation and interpretation
- Selection of methods and applying on an own use case
- Reporting
Bachelor: Digital Journalism and Media

No: M 43.2  
Name: Search Engine Technology  
Terms: Winter Semester (starts for the first time in October 2019)  
Credits: 4  
Instructor: Prof. Dr. Gernot Heisenberg

Learning outcomes
(WHAT) You can perform most complex research tasks on the web,

(HOW) by formulating your specific user information needs in a structured way, as well as iteratively match the possibilities and limitations of search engine technology (by understanding crawling, parsing, indexing, ranking, rendering, and interaction with the user) and creating and applying a complex research concept,

(WHY) in order to lubricate targeted relevant information from a lot of information that otherwise, due to its size, cannot be processed by human, cognitive filter options.

Contents

- Search Engine Technology Basics  
  o Fundamental functionalities of algorithmic universal search engines  
  o Ranking by relevance criteria  
  o Analysis of Search Engine Result Pages (SERP)
- Optimization and Evaluation  
  o Query optimization  
  o Evaluation of search engine result quality
- Advanced Search Engine Technologies  
  o Search Engines for social media content  
  o Ambient findability  
  o Semantics
No: M 72.a
Name: Programmatic Advertising
Terms: Winter Semester (starts for the first time in April 2022)
Credits: 3
Instructor: Prof. Dr. Gernot Heisenberg

Learning outcomes
(WHAT) Students are able to understand the differences between classic display advertising and programmatic advertising,

(HOW) by profoundly analyzing the approaches, their respective potentials, advantages and disadvantages working out and justifying the concepts of either method, explaining the technical processes in detail and comparing their essential characteristics in all phases,

(WHY) in order to be able to decide in the future, whether to use Programmatic Advertising, adjust or apply new fields of application.

Contents
- Basics
  o Online Marketing
  o Display Advertising
  o Formats
  o KPIs
  o Media planning
  o Buying and Selling
- Technical processes
  o Realtime Bidding / Realtime Advertising
  o Bidding processes
  o SSD (Sell Side Platform)
  o DSP (Demand Side Platform)
  o DMP (Data Management Platform)
  o Ad Server Technologies
  o Accounting and Models
- User data analytics
  o Targeting methods
  o Thin Data / First Party Data / Third Party Data
- Scoring
No: M 71.a
Name: Methods of User Experience
Terms: Summer Semester (starts for the first time in April 2022)
Credits: 3
Instructor: Prof. Dr. Amelie Duckwitz

Learning outcomes

(WHAT) Students understand the basic idea and history of UX, and know the importance in corporate communications,

(HOW) they can use the different methods of user experience design

(WHY) in order to design and implement user-centric applications, as well as select and critically reflect the UX methods according to the context.

Contents

Definition
- dimensions and history of user experience
- User Experience and Customer Journey
- How to plan UX projects

Methods
- Design Thinking as a strategy and instrument
- Personas
- Creativity techniques
- Prototyping
- Testing

Discussion
Bachelor: Library Studies and Digital Communication

No: 3.2.1
Name: Library Management (30 h contact time | 60 h self-study)
Terms: Winter semester (starts for the first time in October 2020)
Credits: 3
Instructor: Prof. Dr. Simone Fühles-Ubach

Learning Outcomes

(WHAT) Students can
- assess the different perspectives of management in a differentiated way,
- use the management cycle and its phases for target and strategy planning
- carry out portfolio analyses, SWOT analyses, environmental environment analyses and stakeholder analyses
- develop your own library strategies with mission statement, mission, vision and critical success factors using various methods (KGSt, PRUB, IOOI).
- evaluate embedded librarian and liaison librarian as strategy concepts
- do benchmarking with similar institutions, analysis and evaluation (library monitor, own Excel dashboard)
- systematically collect and record data from different areas of the library and use it to calculate key figures for different library areas (library metrics)
- evaluate and assess library data (internal or external) (library assessment)

(HOW) They do this by collecting, structuring, and evaluating and analyzing the data which are pre-determined in the library context and which arise during use (internal data) and which are also consulted by the supporting institutions (external data) according to various criteria.
(WHY) By analyzing external and internal data, students are in a position to develop quantitative and qualitative objectives for the planning process in libraries and to accompany the organization and control of the process. In addition, comprehensive and long-term planning can be formulated in a library strategy.

Contents

Starting with the basics of management, the dimensions and instruments of management are first presented. The management cycle is then introduced as a core process for all operational control issues and simultaneously as a central element of strategy development. Portfolio analyses, environmental environment analyses and stakeholder analyses are also considered in the context of strategy development for libraries.
Students get to know several ways of creating a strategy for public enterprises (KGSt, PRUB; I00I). The concepts of embedded librarians and liaison librarians are taught as partial strategies.

Basic concepts of controlling are supplemented by practical exercises on benchmarking with data from the German Library Statistics (library monitor). Library Metrics as extended work with key figures for all library areas - stock, stock usage, library usage - replaces the previous performance measurement. Library Assessment, which is designed to learn as much as possible about user and non-user needs and assesses how well these needs are supported, is conducted to improve library locations, services and resource utilization.
The students get to know the areas of personnel management and personnel management as well as their different functions and tasks. The focus is on the development and justification of an employee-oriented personnel management for the different sizes and requirements in libraries and the different types of libraries. The acquired knowledge enables the students to design their own personnel measures.

- Basics and influencing factors of personnel management
- Economy- and behavior-oriented theory approaches (motivation, leadership and relationship)
- Strategic personnel work
- Recruitment, personnel planning, personnel development
- Personnel development and leadership relationships
- Staff appraisals

The event will be enhanced by guest lectures.

Prerequisites for participation: -

Type of module examination:
Homework or written exam
Individual services: Examination or term paper; the result is 50% of the module grade.

Mandatory module, evaluated