


Welcome to DIMA and DFKI/IAM



Dear Students,
The *Database Systems and Information Management (DIMA)* Group at the **Technische Universität Berlin** and the affiliated *Intelligent Analysis for Massive Data* Research Department at the **German Research Center for Artificial Intelligence (DFKI/IAM)** offer numerous opportunities to learn, grow, and develop. This poster was created to inform you about educational programmes, course offerings, thesis opportunities, and prospective career possibilities. It is particularly informative for students interested in pursuing a Master's or PhD with a concentration in Information Management, Data Science, and Big Data.

Our courses enable students to develop fundamental skills relevant for today's job market, entrepreneurs seeking to start their own business, & prospective doctoral students. Our curriculum is especially designed to ensure *sound theoretical knowledge*, supplemented with *hands-on lab sessions*, *development projects*, and *seminars* to deepen understanding. Furthermore, guest lecturers from academia and industry often visit us to share their insights into current technologies and market trends. **We wish you great success!**

Prof. Dr. Volker Markl
Head of DIMA and DFKI/IAM
- Prof. Dr. Volker Markl

TU Berlin Study Programs


Computer Science

Computer Engineering **Business Informatics** **Industrial Engineering**


DIMA offers courses for various technical study programs. Our graduate courses provide an ideal foundation for software engineering oriented students and enable them to design & implement complex information management solutions. The DIMA team is comprised of highly qualified individuals with extensive experience in real world applications and research with various companies, such as IBM, Oracle, and SAP. Our program offers the optimal academic preparation to enable our students to develop innovative solutions for real world problems, to start their own company, or to pursue a PhD. Moreover, the **data analytics master track** and the **information management master track** enable students to specialize in the rapidly growing fields of big data and data science.

European Union Study Programs

DIMA is a member of two European Union sponsored Master's Programmes.



The EIT Digital Master's School is comprised of **twenty top European universities**. Its network of partners, including renowned researchers and leading businesses, provides **cutting-edge ICT training**, complemented with innovation/entrepreneurship training. Upon completion, students earn dual degrees & an EIT-labeled certificate.



The Erasmus Mundus Joint Master Degree's Programme in **Information Technologies for Business Intelligence** enables students to develop knowledge and skills in business intelligence, and prepares them to develop strategies for modern enterprise decision making.

The EIT-Digital and IT4BI Master's Programmes differ in their mobility schemes and specialization areas.

- IT4BI** focuses on business intelligence fundamentals, including data warehouses, data mining, and business process management. Students enroll in courses at ULB and UFRT in Year 1, then transfer to another university. At TU Berlin, DIMA offers a specialization track on **"Large Scale Business Intelligence."**
- The **EIT-Digital Master School (EIT-DMS) Data Science** major has a strong focus on entrepreneurship. *Data Science* students study at TU/e Eindhoven, UNS Nice Sophia-Antipolis, or UPM Madrid in Year 1 and then transfer to another university. At TU Berlin, DIMA offers EIT-Digital Data Science students the option to specialize in the **"Design, Implementation, and Usage of Data Science Instruments."**



Bachelor

Basic Bachelor Courses

ISDA
Information Systems and Data Analysis

Learn the concepts of information management using (relational) database systems from the perspective of an application developer.

ECTS: 6 TERM: SS MODUS: 4 IV

Advanced Bachelor Courses

INFMOD
Advanced Information Modeling

Achieve detailed competences in modeling, classical databases and information systems as well as highly heterogeneous distributed information.

ECTS: 6 TERM: SS MODUS: 4 IV

DW: Data Warehousing and Business Intelligence

Learn how data warehouses differ from classical transactional databases and experience multi-dimensional data models, data mining, and business intelligence.

ECTS: 6 TERM: WS MODUS: 4 IV

Lab Courses and Seminars

DBPRA
Database Lab Course

Intensify practical skills in designing, implementing, and administrating database applications using concrete application examples.

ECTS: 6 TERM: WS/SS MODUS: 4 PRA

DBSEM
Beauty is our Business

Learn to critically read academic publications, present them in an understandable and enjoyable fashion, and write a scientific report.

ECTS: 3 TERM: WS/SS MODUS: 2 SE

DBPRO
Database Project

Develop an information system jointly with a team along a classical development process, including the functional specification, modelling, implementation and demonstration of the system.

ECTS: 6 TERM: WS/SS MODUS: 4 PJ

Master

Basic Master Courses

DBT
Database Technology

Learn both the fundamentals of data processing in traditional single-node database systems and how to scale out these techniques to huge amounts of data in large-scale, distributed environments.

ECTS: 6 TERM: WS MODUS: 4 IV

IDB-PRA
Implementation of a Database Engine

Learn how to implement components of a database system. You will create a working SQL query processor that can answer a set of basic queries.

ECTS: 6 TERM: WS MODUS: 4 PRA

Information Management Seminars

IMSEM
Hot Topics in Information Management

Analyse and present a state of the art research publication in the field of information management and investigate its broader research context.

ECTS: 3 TERM: WS/SS MODUS: 2 SE

BDASEM
Big Data Analytics Seminar

Review and present the current state of the art in Big Data Analytics using a set of key literature under the guidance of an assigned mentor.

ECTS: 3 TERM: WS MODUS: 2 IV

Information Management Projects

IMPRO
Information Management Project

Analyse current issues in the information management (IM) area and solve an IM problem jointly in a team.

ECTS: 6 TERM: WS/SS MODUS: 4 PJ

IMPRO 3
Big Data Analytics Project (BDAPRO)

Analyse current issues in big data analytics and data science systematically. Students will use state of the art open source tools and enhance them jointly in a team.

ECTS: 9 TERM: WS/SS MODUS: 6 PJ

Advanced Information Management Courses

AIM 1: Heterogeneous and Distributed Information Systems

Learn about modern distributed, heterogeneous systems based on concepts of model integration, data integration, federation of information management systems and meta data management.

ECTS: 6 TERM: WS MODUS: 4 IV

AIM 2
Management of Data Streams

Develop deep skills in conventional, methodical and practical processing of continuous data streams using various application examples.

ECTS: 6 TERM: WS MODUS: 4 IV

AIM 3
Scalable Data Science

Learn about scalable analytics (e.g., based on machine learning), big data systems, and application areas, such as text mining, graph mining, and other applications.

ECTS: 6 TERM: WS/SS MODUS: 4 IV

Bachelor's Thesis Opportunities

in-memory data management, Apache Hadoop Query Optimization, parallel data processing, Data Mining, NoSQL, Database Technology, Big Data Analytics, Apache Flink, transaction management, New Hardware Architectures

DIMA thesis opportunities provide students with challenging research problems and enable them to collaborate with national and international research partners. DIMA regularly offers numerous Bachelor's thesis opportunities, often tied to ongoing research projects from various fields.

Post Bachelor's Opportunities

Pursue a Master's Degree & fulfill the requirements of one of three programs: (1) specialize in *Databases and Information Management*, following TUB guidelines, (2) specialize in *Business Intelligence* via the IT4BI Master's Degree Programme, or (3) specialize in *Data Science* via the EIT Digital Master's School.

Alternatively, join the job market as a *Data Analyst*, *Database Administrator*, *Database Engineer*, or *Software Engineer*.

Master's Studies **Start Your Career**

Master Theses at DIMA

Representative Theses Completed at DIMA:
Content Relevance-Based Semantic Sentence Retrieval
Large Scale Centrality Measures in Apache Flink and Apache Giraph
Rich Window Discretization Techniques in Distributed Stream Processing
Inferring Program Runtime Estimated from Database Statistics
Resilient Machine Learning on Stream Processing Engines
Improving Concrete Syntax of Graphical Modeling Languages for BPM

DIMA regularly offers opportunities for master theses in various database and information management related fields. Our thesis topics emphasize the design, development and evaluation of modern information management systems.

You will deepen your knowledge in classical information management concepts, big data, and data science. Ideally, students will possess outstanding programming skills in C++, Java, or Scala, extensive knowledge in database systems, and have already completed DIMA coursework. For a current list of open thesis topics visit www.dima.tu-berlin.de/menue/theses/.

1) Be a DIMA Doctoral Student

Learn how to conduct world class research in info management/data science

- Experience the research process from idea generation, prototype design and implementation to experimental and analytical evaluation
- Gain deep knowledge in a your specialization area
- Identify open research questions, devise novel solutions, and validate them
- Make an impact with your own scientific contributions

Enhance your communication/organizational skills

- Learn proven techniques to disseminate and publish your findings at top-tier venues (e.g. VLDB, SIGMOD, ICDE, EDDBT)
- Contribute to large scale and open source software projects
- Identify and critically read leading scientific works
- Possibility for excellent PhD students to participate in Software Campus

Broaden your expertise

- Gain technical expertise in database systems, data analysis, data mining, and related topics
- Enhance business and networking skills and interface with researchers and business leaders
- Gain professional work experience by engaging in summer internships

amazon twitter Microsoft ORACLE IBM SAP Google

2) Be an Entrepreneur

Our team members have founded or contributed to the establishment of companies and startups, such as:

dataArtisans The makers of Apache Flink; a new approach to distributed data processing for the Hadoop ecosystem.

The Best Online Whiteboard for Creation & Education. Spacedeck makes it easy for you to create, manage and share ideas. **Spacedeck**

ParStream Introducing the industry's first analytics platform built for the Internet of Things. A fully integrated, tested, fast and low-latency big-data platform.

CENTRE EPRE NEUS SHIP **Bundesministerium für Wirtschaft und Technologie** **eXIST** Existenzgründungen aus der Wissenschaft **EUROPAISCHE UNION** **ESF** Europäischer Sozialfonds für Deutschland

3) Be a Data Scientist / Data Engineer

Our former team members have gone on to have successful careers with companies, universities, or research institutions, such as:

DFKI Senior Researcher German Research Center for Artificial Intelligence (DFKI) **amazon** ML Researcher Amazon

snowflake Software Engineer Snowflake Computing **SAP** Software Engineer SAP Innovation Center

BEUTH HOCHSCHULE FÜR TECHNIK BERLIN University of Applied Sciences **Full Professor** Beuth Hochschule

भारतीय प्रौद्योगिकी संस्थान हैदराबाद Indian Institute of Technology Hyderabad **Assistant Professor** IIT Hyderabad