Dpt : DAPA

Research in the Department of Databases and Machine Learning is centered around statistical, symbolic and relational machine learning and distributed databases. Statistical methods, neural networks, fuzzy logic, information fusion, data replication, distributed query and transaction processing are amongst the methods currently used for fundamental and applied research, as well as formal concept analysis, ontologies and deep architectures in artificial vision.

The target applications are situated in a large variety of domains which range from adaptive or selective information retrieval in text, web, images, videos and social networks, to continuous query-based information aggregation and web archiving.

Content-based information retrieval, text, image and multimedia automatic indexing and database querying are three complementary approaches for accessing heterogeneous data. Methods are proposed for the efficient processing of structured or semi-structured information, for instance by means of statistical methods, to analyze structured corpora (XML, social networks) or to retrieve specific information. Several research activities in the department use advanced data management services like replication and streaming whose efficiency relies on new logical network organizations, distributed index structures and adaptive routing algorithms for efficiency. We also study new intelligent crawling strategies and temporal query languages for web archives and the issue of query-based continuous information aggregation in distributed web content syndication networks.

Risk analysis, crisis management, **information evaluation**, heterogeneous **data fusion**, evolutionary information follow-up in social networks, knowledge discovery, are particularly studied in large databases. Web usage mining, prefetching, recommendation systems, interface customization help the user interact with web pages and to extract relevant information. More generally, the Department's research concerns **user modelling** and profiling, adaptive hypermedia and **interface personalization**, for instance content adaptive navigation interfaces, pen-based interfaces, smartphones and tablets. Affective computing is also a domain addressed by the department through emotion and opinion mining in texts and images, as well as links between emotions and psycho-physiological signals.

R&D projects

European Networks of Excellence

Pascal2 (pattern analysis, statistical modeling and computational learning)

European projects

SCAPE (SCAlable Preservation Environments), USIXML

Industrial research:

Cap Digital (Business Cluster for Digital Content)
Numerous national research grants

Industry Partners :

THALES CFR, THALES TRT, ONERA, FRANCE TELECOM, EADS, IGN, INA, ALCATEL-LUCENT-BELL LABS, CEA, SONY, EDF, ANTIDOT, ARISEM, PERTIMM, KXEN, MONDECA, VECSYS, INTELLIGENT LEARNING OBJECTS, BBSP, CADEGE HOSSUR, PRYLOS, BLOGSPIRIT, KARTOO, DIEDRE DESIGN, EXALEAD, EPAGINE, GOSTAI, PI AUTOMATION, MONDOMIX MEDIA, TRAVELSOFT, HEAVEN Conseil, TELEFUN, ALTIC, GIE CARTES BANVAIRES, EUROPEAN ARCHIVES.

Teams :

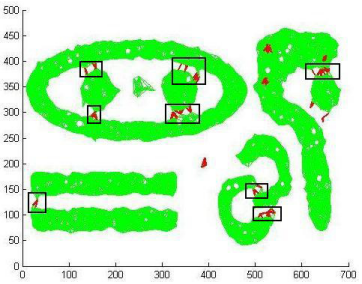
MALIRE
Machine Learning and Information Retrieval
BD
Databases
ACASA
Cognitive Agents and Automated Symbolic Learning

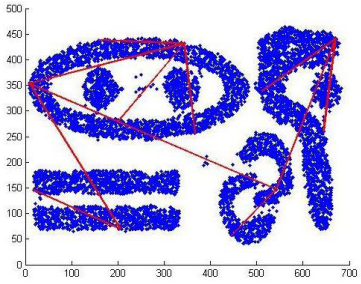
Academic program :

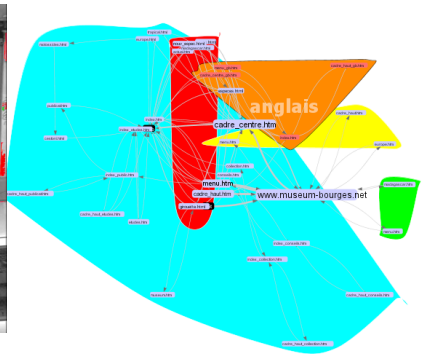
Master in Computer Science: Artificial intelligence and Decision making , Image Processing
Master Erasmus Mundus «Data Mining and Knowledge Management»

Software patents :

European patents on voluntary ocular signal utilization, information management for intelligence services, symbolic information fusion







Keywords

Statistical and symbolic machine learning, large scale data processing, data flows, web archiving, text and multimedia information retrieval, interfaces et user modeling, semantic web.