

DM2L Team

Data Mining and Machine Learning

Laboratoire d'InfoRmatique en Image et Systèmes d'information

LIRIS UMR 5205 CNRS / INSA de Lyon / Université Claude Bernard Lyon 1 / Université Lumière Lyon 2 / Ecole Centrale de Lyon

We design methods and tools to support knowledge discovery from data. We work on open problems in both data mining and machine learning areas (constraint-based mining and declarative approaches, spatio-temporal data and stream analysis, feature selection, graph mining, constrained clustering, bayesian network learning, etc). We are involved in many collaborative projects with data owners from various domains. Among others, we contribute to the complex system area by looking at the synergy between hypothesis elicitation and modeling.

The team

Members

4 Professors

6 Associate Professors (incl 1 half-time member)

9 PhD students

Defended PhD Thesis

2 per year in average

Scientific skills and societal challenges

Scientific skills

- Constraint-based pattern mining, clustering, inductive data-bases, formal concept analysis
- neural networks
- complex system modeling
- feature selection, Bayesian networks ensemble methods, topologic methods
- graphs, sequences and streams

Societal challenges

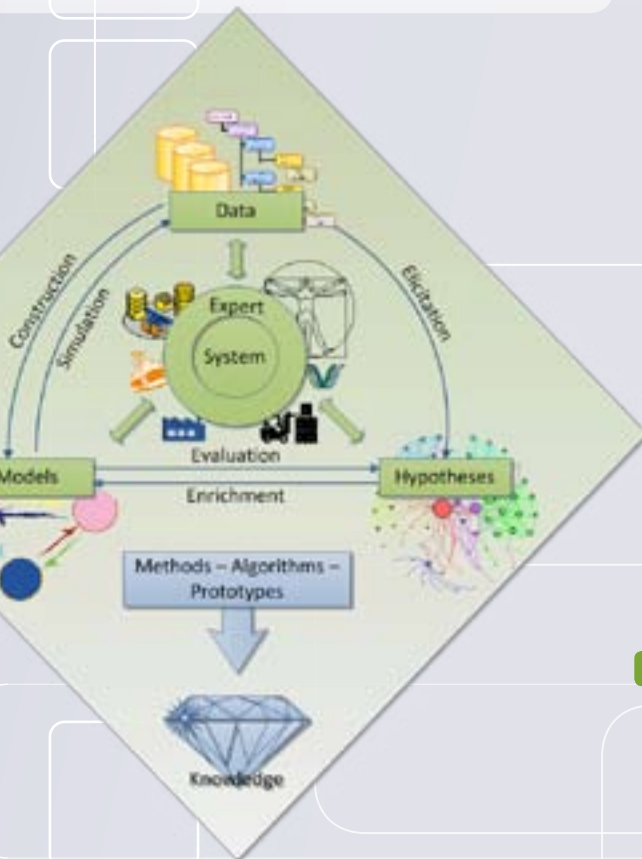
- Improving urban travel conditions
- Study of bike sharing system usages
- Help to optimize the treatment of road in winter
- Studying the impacts of human activities on ecosystems
- Study of soil erosion and landslides
- Collaboration in Medicine and Biology

Highlights

- New research focus on dynamic and attributed graph mining
- Identification of risk factors for nasopharynx cancer using Bayesian networks
- New genetic sampling process in collaboration with researchers in ecology of conservation

Softwares and platforms

- DM2L develops its own platform that integrates the different prototypes of the team



Contacts

Cordinator

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Positioning

International context

- European projects
 - GRAISearch, Call FP7-PEOPLE-2013-IAPP: Skills Transfer Project to an Irish company that develops a web search engine for social media using geo-location.
 - INTEGRATE, ENIAC Joint Undertaking: DM2L is involved in the WP «Data Analysis and Yield» that aims to apply our tools to data from manufacturing processes in the field of semiconductors.
- Project FAPEMIG, FAPS / INRIA / CNRS-INS2I that supports a collaboration with the Federal University of Minas Gerais, Belo Horizonte, Brazil and INRIA Nancy Grand Est. The project is to mine data as text or graphs.
- Reviewer for: Data Mining and Knowledge Discovery (editorial board), Knowledge and Data Engineering International Journal, IEEE Transactions on Knowledge and Data Engineering, Information Systems, International Journal of Uncertainty, Fuzziness and Knowledge-Based Systems, Journal of Intelligent Information Systems, Bioinformatics and Biology Insights (editorial board), Review of Information Sciences and Technology (IST), Statistical Analysis and Data Mining

National context

- ANR SOCINNOV Vél'innov «The bicycles sharing system's study as an innovative socio-technical system and its social appropriations.»
- ANR COSINUS FOSTER: Spatio-Temporal Data Mining - Application to Soil Erosion Monitoring
- Project challenge mastodons AMADOUER for analysis of urban and environmental data

Regional context

- Projects labex IMU «Intelligences urban Worlds» Vélo'vGR
- Participation to «Optimod'Lyon: Optimizing urban sustainable mobility.» Proposition of predictive and explanatory models of urban traffic.
- Member of the steering committee of the Complex Systems Institute in Rhône-Alpes (IXXI)

Industrial partnerships

- EADS, Renault Trucks, Plastic Omnium, Visoon, Araxxe, ProbaYes, Ividence, Michelin

International relationships

- Leuven and Antwerp (Belgium), Pisa and Turin (Italy), Belo Horizonte (Brazil), Moscow (Russia), University of Annaba (Algeria), Galatasaray University (Tunisia), Institute of Mathematics and Computer Vilnius (Lithuania)

International journals and conferences

- Machine Learning
- Data Mining and Knowledge Discovery
- IEEE Transactions on Knowledge and Data Engineering
- Data and Knowledge Engineering
- Intelligent Data Analysis
- Annals of Mathematics and Artificial Intelligence
- ACM SIGKDD Conference on Knowledge Discovery and Data Mining
- European Conference on Artificial Intelligence (ECAI)
- IEEE International Conference on Data Mining
- ACM International Conference on Information and Knowledge Management
- Machine Learning and Knowledge Discovery in Databases European Conference (ECML/PKDD)
- International Joint Conferences on Artificial Intelligence (IJCAI)
- SIAM International Conference on Data Mining