Results of IndexMed GRAIL Days 2016: How to use standards to build GRAphs and mIne data for environmental research? IndexMeed consortium for data mining in ecology

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The Inter operating data challenge: How to mine heterogeneous non linked environmental data for research and management?

Data produced by biodiversity research projects that evaluate and monitor Good Environmental Status have a high potential for use by stakeholders involved in environmental management. The lack of specific scientific objectives, poor organizational logic, and a characterized disorganized collection of data between leads to a decentralized use of data distribution, hampering environmental research. In such a heterogeneous system across different organizations and data formats, it is difficult to efficiently harmonize the outputs. There are few tools available to assist.

Standards (including TDWG recommendations) and specific protocols can be applied to interconnect databases. Such semantic approaches greatly increase data interoperability. The aim of this poster is to present the 2016 IndexMeed workshop results ([https://indexmeed2016.sciencesconf.org](https://indexmeed2016.sciencesconf.org)) and recent actions of the consortium (renamed IndexMeed - Indexing for Mining Ecological and Environmental Data); new approaches to investigate complex research questions and support the emergence of new scientific hypotheses.

Current developments in data mining based on graphs, the potential for important contributions to environmental research, particularly about strategic decision-making, and new ways of organizing data were also discussed at the workshop.

In particular, this workshop promoted decisions on how:
- to analyze heterogeneous distributed data spread in different databases, to create matches and incorporate some approximations
- to identify statistical relationships between observed data and the emergence of contextual patterns, and
- to encourage openness and the sharing of data, in order to value data and their utilization.

The IndexMeed project participants are now exploring the ability of two scientific communities (ecology sensu lato and computer sciences) to work together. The uses of data from biodiversity research demonstrate the prototype functionalities and introduce new perspectives to analyze environmental and societal responses including decision-making. Output of the seminar lists scientific questions that can be resolved by the new data mining approaches and proposes new ways to investigate heterogeneous environmental data with graph mining.

Indeed, we are delighted to invite you to the 2017 IndexMeed Seminar "SAGES DAYS"!

Sciences and Algorithms around Graphs in Environment and Societies that will take place on November 15th-17th 2017 in Paris, at the CNRS headquarters.

Following the successful workshops of 2014, 2015 and 2016, this 4th seminar will promote exchanges between participants, the acquisition of practical methods and will explore new ways to develop algorithms to mine graphs constructed with heterogeneous environmental data. Throught as a collaborative space for experts in ecology and biodiversity and experts in computer science, this "day of ICST, this one has the vocation of developing new research based on the approached related to the graphs, and in particular to construct a project bearing

- on the theoretical aspects (ICST) of algorithms for digraph graphs according to scientific questions and
- on the theoretical aspects of integrating heterogeneous environmental data with a view to construct bio-scenarios and to assist in environmental decision-making.

The 2016 IndexMeed Seminar welcomes abstracts for original oral and poster contributions until the 1st of October 2017. The online submission process will be opened soon until 1st of November 2017. For more details, see the seminar website ([https://indexmeed2017.sciencesconf.org](https://indexmeed2017.sciencesconf.org))

**From last 2016 seminar, IndexMeed became IndexMeed (Indexing for Mining Ecological and Environmental Data).** The task of the newly created consortium of IndexMeed is to index biodiversity data (and to provide an index of qualified existing open datasets) and make it possible to build graphs to assist in the analysis and development of new ways to mine data and to build new Intelligent Decision Support Systems (IDSS). Architecture of this project was defined at EGI Workshop "design your e-infrastructure" (Amsterdam) (see below)

http://www.indexmeed.eu and http://www.indexmeed.eu

**The IndexMeed Workflow and e-services**

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