KNOWLEDGE ENGINEERING GROUP

Contact details

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<thead>
<tr>
<th>Name</th>
<th>Knowledge Engineering Group</th>
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<tr>
<td>Acronym</td>
<td>KEG</td>
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<tr>
<td>Logo</td>
<td><img src="image" alt="Knowledge Engineering Group Logo" /></td>
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<tr>
<th>Site</th>
<th><a href="http://keg.utcluj.ro">http://keg.utcluj.ro</a></th>
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| Address       | 26-28 Baritiu St., rooms C09, D01, M03; 400027, Cluj-Napoca, Romania |

<table>
<thead>
<tr>
<th>Faculty</th>
<th>Automation and Computer Science</th>
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<tbody>
<tr>
<td>Department</td>
<td>Computer Science Department</td>
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<thead>
<tr>
<th>Telephone</th>
<th>+40-264202389</th>
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<tbody>
<tr>
<td>Fax</td>
<td>+40-264594491</td>
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<tr>
<th>Director</th>
<th>Prof. Dr. Eng. Rodica Potolea</th>
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<tr>
<td>e-mail</td>
<td><a href="mailto:rodica.potolea@cs.utcluj.ro">rodica.potolea@cs.utcluj.ro</a></td>
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**Areas of expertise**

**Fundamental theoretical aspects:**
- dealing with problem-specific features extraction from both structured data, pre-processing techniques for handling noisy and/or incomplete data, learning from balanced/unbalanced and structured/unstructured data

**Practical approaches:**
- Data Mining application prototypes for both structured data (assisted medical diagnosis, spam detection, signature recognition) and unstructured data (topic extraction, opinion mining, community detection, semi-supervised text labelling, contradiction detection)
- Business Intelligence application prototypes dealing with heterogeneous data integration by ontology-driven, (semi-) automatic design of unified data structures and automatic design of the corresponding ETL processes

**Team**

Prof. Dr. Eng. Rodica Potolea, Assoc. Prof. Dr. Eng. Mihaela Dinsoreanu, Assist. Prof.Dr. Eng. Camelia Lemnaru, Eng. Lucian Teodosescu PhD


**Representative projects**

“Next generation product service”, international project with third parties (company Electrolux Italy), (2014-2015)


FOOD-TRACE, “Integrated IT system for assuring traceability and quality control in food industry”, National research grant funded by ANCS, CEEX program, (2006 - 2008)

IntelPro, “Intelligent system for assisting the therapeutically decision at patients with prostate cancer”, National research grant funded by ANCS, CEEX - INFOSOC, (2005-2008)
Significant results

The most representative publications of the past 5 years:
7. C. Lemnaru, A. Bona, R. Potolea,” Distributed Methodologies for Imbalanced Classification Problems: Parameter Analysis and Tuning”, ISPDC 2013, pp. 53-58

Significant solutions:
Handling incomplete records and irrelevant and/or redundant pieces of information, imbalanced class distribution and error costs
Identifying the right performance metric given the context, algorithm and model selection
Schema mapping and data fusion
Context-sensitive IR from unstructured sources
Community detection and opinion mining

Products and technologies:
1. Recommendation systems - context sensitive, semantic driven recommendation systems for online advertisement and tourism
2. Topic extraction and representation - identifying the topic polarity in a given document; projecting (very) large (un)structured data to relevant dimensions and providing representation to allow knowledge extraction
3. Community detection- identifying clusters from implicit and/or explicit connections; community detection social data; opinion driven community detection
4. User profiling - finding groups of individuals with similar features, finding/defining patterns for various profiles, predicting trends and future behaviour applied to the educational domain
5. Contradiction Detection - opinion mining driven contradiction detection
6. Medical decision support systems - assisting medical diagnosis in prostate cancer and rheumatoid diseases

The offer addressed to the economic environment

| Research & development | Recommendation systems in different areas – developing prototype recommendation systems according to state of the art techniques in the field and up-to-date technologies.
| | Topic extraction and representation – identifying concepts to be representative in a given context; projecting (very) large (un)structured data to relevant dimensions and providing representation to allow knowledge extraction.
| | Community detection– identifying clusters from implicit and/or explicit connections.
| | User profiling – finding groups of individuals with similar features, finding/defining patterns for various profiles, predicting trends and future behaviour.
| | Schema mapping and data fusion – designing unified data (warehouse) structures to integrate heterogeneous data sources, designing corresponding ETL processes.
| | Decision support systems – extracting knowledge from organizational data, predicting evolutions, trends, identify relationships and correlations.

| Consulting | Consulting, design, research and prototyping towards development of data mining and machine learning based solutions for multiple industrial and scientific fields.

| Training | Data mining (basic and advanced techniques). Machine learning techniques |