
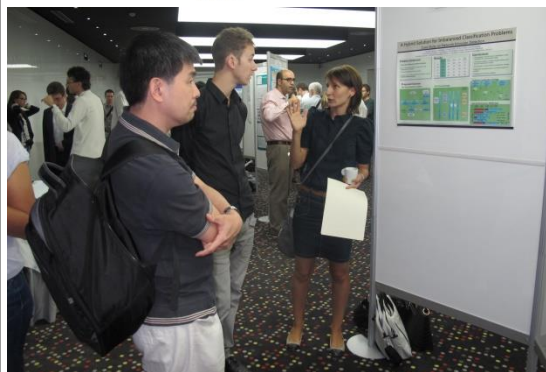
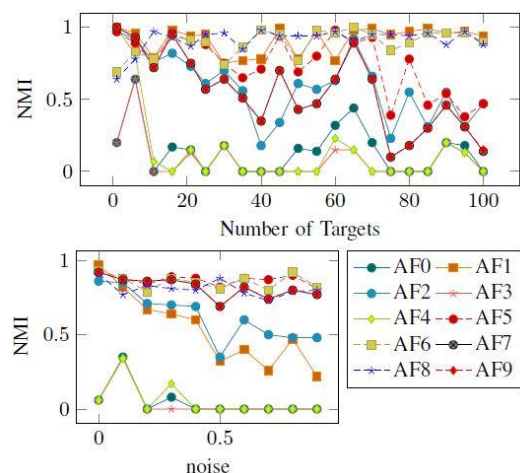


KNOWLEDGE ENGINEERING GROUP

Contact details

Name	Knowledge Engineering Group
Acronym	KEG
Logo	
Site	http://keg.utcluj.ro http://research.utcluj.ro/tl_files/research/Research%20Domain/Computer%20Science/6_Potolea.pdf
Address	26-28 Baritiu St., rooms C09, D01, M03; 400027, Cluj-Napoca, Romania
Faculty Department	Automation and Computer Science Computer Science Department
Telephone	+40-264202389
Fax	+40-264594491
Director	Prof. Dr. Eng. Rodica Potolea
e-mail	rodica.potolea@cs.utcluj.ro



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, Prof. Dr. Eng. Mihaela Dinsoreanu, Assist. Prof. Dr. Eng. Camelia Lemnaru, Eng. Lucian Teodosescu PhD
PhD Students: Eng. Victor Ionescu, Eng. Ioana Barbantan, Eng. Cristian Lungu, Eng. Florin Macicasan, Eng. Octavian Hasna, Eng. Andreea Baciu

Representative projects

“Next generation product service”, international project with third parties (company Electrolux Italy), (2014-2017)
NOKIA, “Context-sensitive recommendation systems”, Bilateral grant, (2011-2012)
SEArCH, “Adaptive eLearning Systems using Concept Maps”, National research grant funded by CNMP Program 4: Research partnership for priority domains, (2008-2011)
GridMOSI, “Virtual Organization using Grid Technology for High Performance Modeling, Simulation and Optimization”, National research grant funded by ANCS, CEEX program, (2005-2008)
ArhiNet, “Integrated System for developing semantically-enhanced archival content”, National research grant funded by CNMP Program 4: Research partnership for priority domains, (2007-2010)
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:

1. Borsos, Zalan; Lemnaru, Camelia; Potolea, Rodica, Dealing with overlap and imbalance: a new metric and approach PATTERN ANALYSIS AND APPLICATIONS Volume: 21 Issue: 2 Pages: 381-395 Published: MAY 2018
2. Dolean, Samuel; Dinsoreanu, Mihaela; Muresan, Raul Cristian; et al., A Scaled-Correlation Based Approach for Defining and Analyzing Functional Networks 6th International Workshop on New Frontiers in Mining Complex Patterns (NFMCP) Location: Skopje, MACEDONIA Date: SEP 18-22, 2017 NEW FRONTIERS IN MINING COMPLEX PATTERNS, NFMCP 2017, Book Series: Lecture Notes in Artificial Intelligence Volume: 10785 Pages: 80-92 Published: 2018
3. P. Parau, C. Lemnaru, M. Dinsoreanu, and R. Potolea, OPINION LEADER DETECTION (Sentiment Analysis in Social Networks). San Francisco: Morgan Kaufmann Pub Inc, 2017, pp. 157-170.
4. P. Parau, C. Lemnaru, M. Dinsoreanu, and R. Potolea, OPINION LEADER DETECTION (Sentiment Analysis in Social Networks). San Francisco: Morgan Kaufmann Pub Inc, 2017, pp. 157-170.
5. I. Barbantan, M. Porumb, C. Lemnaru, and R. Potolea, "Feature Engineered Relation Extraction - Medical Documents Setting," *International Journal of Web Information Systems*, vol. 12, pp. 336-358, 2016.
6. Hasna Octavian Lucian, Macicasan Florin Cristian, Dinsoreanu Mihaela, Potolea Rodica, "Modeling Sentiment Polarity with Meta-features to Achieve Domain-Independence", *6th International Joint Conference on Knowledge Discovery, Knowledge Engineering and Knowledge Management, (IC3K)*, Rome, ITALY, OCT 21-24, 2014, Vol. 553, Pp. 212-227, Published: 2015
7. Radulescu Cristina, Dinsoreanu Mihaela, Potolea Rodica, "Identification of Spam Comments using Natural Language Processing Techniques", *IEEE 10th International Conference on Intelligent Computer Communication and Processing (ICCP)*, Cluj Napoca, ROMANIA, SEP 04-06, 2014, Pp. 29-35
8. Anisiei Ancuta-Lenuta, Lemnaru Camelia, Dinsoreanu Mihaela, Potolea Rodica, "Extracting Opinion Holders and Targets in Romanian Texts", *IEEE 10th International Conference on Intelligent Computer Communication and Processing (ICCP)*, Cluj Napoca, Romania, Sep 04-06, 2014, Pages: 37-42, Published: 2014
9. M.Dinsoreanu, R. Potolea, "Towards a Unified Thematic Model for Recommending Context-Sensitive Content", in *Knowledge Discovery, Knowledge Engineering and Knowledge Management, Communications in Computer and Information Science*, vol. 415, 2013, pp. 68-83
10. M.Dinsoreanu, R.Potolea, "A scalable approach for Contradiction Detection driven by Opinion mining", *iiWAS2013*, pp. 7-15

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	<p>Recommendation systems in different areas – developing prototype recommendation systems according to state of the art techniques in the field and up-to-date technologies.</p> <p>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.</p> <p>Community detection– identifying clusters from implicit and/or explicit connections.</p> <p>User profiling – finding groups of individuals with similar features, finding/defining patterns for various profiles, predicting trends and future behaviour.</p> <p>Schema mapping and data fusion – designing unified data (warehouse) structures to integrate heterogeneous data sources, designing corresponding ETL processes.</p> <p>Decision support systems – extracting knowledge from organizational data, predicting evolutions, trends, identify relationships and correlations.</p>
Consulting	<p>Consulting, design, research and prototyping towards development of data mining and machine learning based solutions for multiple industrial and scientific fields.</p>
Training	<p>Data mining (basic and advanced techniques).Machine learning techniques</p>