
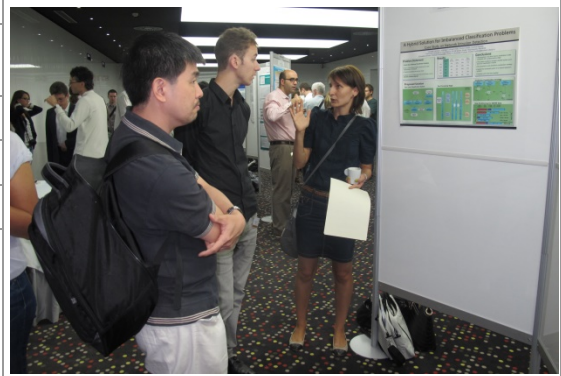
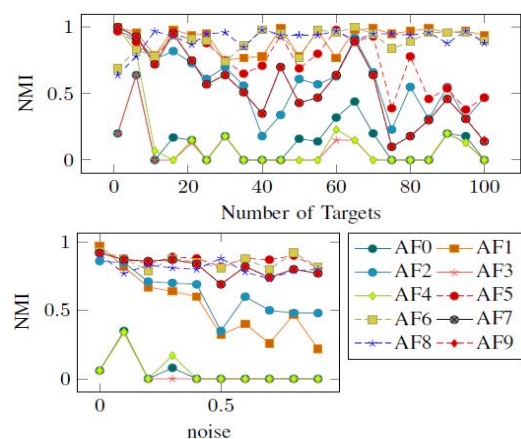


KNOWLEDGE ENGINEERING GROUP

Contact details

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Areas of expertise

Fundamental theoretical aspects:

Data analytics methods and learning models for natural language understanding, explainable graph analysis, heterogenous data integration and analysis.

Practical approaches:

Natural language understanding: topic extraction, sentiment analysis, contradiction detection, semantic role labeling, semantic parsing, intent detection and slot filling,

Graph analysis: community detection, functional networks construction from brain signal, functional networks (dynamic) analysis,

Heterogenous data: (i) IoT: preventive maintenance, failure prediction, user profiling, smart driving (ii) brain signal: artefact detection, burst detection and spike sorting, information coding.

Team

Prof. Dr. Eng. Rodica Potolea, Prof. Dr. Eng. Mihaela Dinsoreanu, Assoc. Prof. Dr. Eng. Camelia Lemnaru.

PhD Students: Cristian Lungu, Octavian Hasna, Florin Macicasan, Vlad Topan, Paul Parau, Timotei Dolean, Lucian Cristea, Ramona Tolas, Raluca Portase, Andrei Mihalca, Dan Toderici, Loredana Dan

Representative projects

“Predictive Maintenance”, international project with third parties (Electrolux Italy), 7981/27.03.2019, (2019-2020).

ROBIN - “Robotii si Societatea: Sisteme cognitive pentru Roboti Personali si Vehicule Autonome”, PNCDI III, (2018-2020)

“Next generation product service”, international project with third parties (company Electrolux Italy), (2014-2017)

SWARA – Sistem mobil de asistare vocala in Reintegrarea Persoanelor cu Afonii Chirurgicale, PCCA-2013-4 No. 6/2014 (2014-2016)

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, CEEEX 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, CEEEX program, (2006 - 2008)
IntelPro, “**Intelligent system for assisting the therapeutically decision at patients with prostate cancer**”, National research grant funded by ANCS, CEEEX - INFOSOC, (2005-2008)

Significant results

The most representative publications of the past 5 years:

1. Liana-Daniela Palcu, Marius Supuran, Camelia Lemnaru, Mihaela Dinsoreanu, Rodica Potolea and Raul Cristian Muresan, Discovering discriminative nodes for classification with deep graph convolutional methods, in print Lecture Notes in Artificial Intelligence, Springer 2019
2. I. Stan, V. Suci and R. Potolea, "Smart Driving Methodology for Connected Cars," 2019 23rd International Conference on System Theory, Control and Computing (ICSTCC), 2019, pp. 608-613.
3. A. Stoica, T. Kadar, C. Lemnaru, R. Potolea, M. Dinsoreanu: The Impact of Data Challenges on Intent Detection and Slot Filling for the Home Assistant Scenario. ICCP 2019: 41-47
4. Eugen-Richard Ardelean, Alexander Stanciu, Mihaela Dinsoreanu, Rodica Potolea, Camelia Lemnaru, Vasile Vlad Moca: Space Breakdown Method A new approach for density-based clustering. ICCP 2019: 419-425
5. 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
6. Dolean, Samuel; Dinsoreanu, Mihaela; Muresan, Raul Cristian; et al., A Scaled-Correlation Based Approach for Defining and Analyzing Functional Networks, Book Series: Lecture Notes in Artificial Intelligence Volume: 10785 Pages: 80-92 Published: 2018
7. 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.
8. 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.
9. Hasna Octavian Lucian, Macicasan Florin Cristian, Dinsoreanu Mihaela, Potolea Rodica, "Modeling Sentiment Polarity with Meta-features to Achieve Domain-Independence", *6th (IC3K)*, 2014, Vol. 553, Pp. 212-227,
10. 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
11. M.Dinsoreanu, R.Potolea, "A scalable approach for Contradiction Detection driven by Opinion mining", *iiWAS2013*, pp. 7-15

Significant solutions:

End to end explainable graph classification pipeline
 A new metric for assessing imbalance and overlap in data
 AMR semantic parsing solution

Products and technologies:

1. Specific solutions in the Neuro Science domain (Artefact identification, Burst detection and spike sorting, Functional networks extraction and analysis)
2. Intent detection and slot filling – Eng & Ro languages
3. 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
4. Community detection- identifying clusters from implicit and/or explicit connections; community detection social data; opinion driven community detection. Contradiction Detection - opinion mining driven contradiction detection
5. User profiling - finding groups of individuals with similar features, finding/defining patterns for various profiles, predicting trends and future behavior applied to the educational domain
6. Recommendation systems - context sensitive, semantic driven recommendation systems for online advertisement and tourism
7. 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. User profiling – finding groups of individuals with similar features, finding/defining patterns for various profiles, predicting trends and future behaviour. Data integration – 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. End-to-end data analysis and (deep) machine learning pipelines
Consulting	Consulting, design, research and prototyping ML solutions for multiple industrial and scientific fields.
Training	Data Analysis, Machine Learning, Deep Learning

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