The IADIS European Conference on Data Mining 2010 took place in Freiburg, Germany, 28-30 July, 2010 and was co-organised by Albert-Ludwigs-Universität Freiburg. This conference was part of the Multi Conference on Computer Science and Information Systems 2010 (MCCSIS), 26 - 31 July 2010, which had a total of 1237 submissions.

The IADIS European Conference on Data Mining (ECDM’10) aimed to gather researchers and application developers from a wide range of data mining related areas such as statistics, computational intelligence, pattern recognition, databases and visualization. ECDM’10 had the goal to advance the state of the art in data mining field and its various real world applications. It provided opportunities for technical collaboration among data mining and machine learning researchers around the globe.

The IADIS European Conference on Data Mining 2010 received 59 submissions from more than 17 countries. Each submission had been anonymously reviewed by an average of four independent reviewers, to ensure that the final accepted submissions were of a high standard. Consequently only 11 full papers were published which meant an acceptance rate of about 19%. A few more papers were accepted as short papers, reflection papers and posters. The best paper authors were invited to publish an extended version of their paper in the International Journal of Computer Information Systems and Industrial Management Applications (IJCISIM) ISSN: 2150-7988, in the Journal of Information Assurance and Security (JIAS) ISSN:1554-1010, in the IADIS International Journal on Computer Science and Information Systems (ISSN: 1646-3692) and also in other selected journals, including journals from Inderscience.

The submissions were accepted under the following areas of interest:

**Core Data Mining Topics**
- Parallel and distributed data mining algorithms
- Data streams mining
- Graph mining
- Spatial data mining
- Text video, multimedia data mining
- Web mining
- Pre-processing techniques
- Visualization
- Security and information hiding in data mining

**Data Mining Applications**
- Databases
- Bioinformatics
- Biometrics
- Image analysis
- Financial modeling
- Forecasting
- Classification
- Clustering
- Social Networks

Besides the presentation of full papers, short papers, reflection papers and posters, the conference also included one keynote presentation from a internationally distinguished researcher, Professor Dominique Laurent, ETIS, Univ. Cergy Pontoise, France.


Overall the Conference offered an opportunity to all their participants to discuss with success the most significant aspects regarding the theme Data Mining. It served as a forum that gathered researchers, practitioners, students and anyone that was working or studying in the field of the Data Mining.
Keynote Presentation:

K.1 – MINING FREQUENT CONJUNCTIVE QUERIES IN STAR SCHEMAS

by Professor Dominique Laurent, ETIS, Univ. Cergy Pontoise, France

Abstract:

In this talk we address the issue of mining frequent queries in a relational database (i.e., all queries whose answers have a cardinality greater than a fixed threshold), a problem known to be intractable even for conjunctive queries. We restrict our attention to all relevant conjunctive projection-selection-join queries in a star schemas, that is those queries in which the join involves the fact table. In this particular case, it is shown that the underlying key and foreign-key constraints can be used to define a query pre-ordering with respect to which the support measure is anti-monotonic. Moreover, we argue that significant computational optimizations are possible, based on the fact that this pre-ordering induces an equivalence relation for which all equivalent queries have the same support.

In the first part of the talk, we motivate our work and show that the knowledge of frequent queries allows to discover not only association rules, but also unknown constraints holding on the database (such as function l and inclusion dependencies as well as conditional functional dependencies). Then, we provide the basic definitions and properties of the considered query pre-ordering and its induced equivalence relation. In the second part of the talk, we provide algorithms for the computation of frequent queries, and we focus on the computational aspects. We show that the complexity of our algorithms is linear in the size of the database to be mined. We report on experiments showing the efficiency of our method.

Best Papers:

- AN EVALUATION OF META LEARNING AND DISTRIBUTION STRATEGIES IN DISTRIBUTED MACHINE LEARNING

by Andreas D. Lattner, Alexander Grimme and Ingo J. Timm, Goethe-Universität Frankfurt, Germany

Abstract:

With technical progress in the past decades with multi-core computing, networking, broad availability of computing resources as well as the possibility to store and process huge amounts of data the desire of taking advantage of this situation emerges. In our work, we introduce a distributed learning approach with meta learning and compare different partitioning and majority voting strategies. We focus on strategies that allow for parallel learning and compare different combinations of distribution, meta learning, and voting strategies in an experimental evaluation on two test sets. The results show clear improvement in run time in distributed learning while the results on meta learning exhibit an advantage only in one of the two data sets.

- A NEW DENSITY-BASED CLUSTERING APPROACH IN GRAPH THEORETIC CONTEXT

by Tülin İnkaya, Sinan Kayalıgil and Nur Evin Özdemirel, Middle East Technical University, Turkey

Abstract:

We consider the clustering problem with arbitrary shapes and different densities both within and between the clusters, where the number of clusters is unknown. We propose a new density-based approach in the graph theory context. The proposed algorithm has three phases. The first phase makes use of graph-based and density-based clustering approaches in order to identify the neighborhood structure of data points. The second phase detects outliers using the local outlier concept. In the third phase, a hierarchical agglomeration is performed to form the final clusters. The algorithm is tested on a number data sets and found to be effective.
Committees:

**Program Chair:** Ajith P. Abraham, School of Computer Science, Chung-Ang University, South Korea

**Conference Co-Chairs:**
- Piet Kommers, University of Twente, The Netherlands
- Pedro Isaías, Universidade Aberta (Portuguese Open University), Portugal
- Dirk Ilenthaler, Albert-Ludwigs-Universität Freiburg, Germany
- Nian-Shing Chen, National Sun Yat-sen University, Taiwan

**Committee Members:**
- Abdel-Badeeh M. Salem, Ain Shams University, Egypt
- Akihiro Inokuchi, Osaka University, Japan
- Alessandra Raffaeta, Universita Ca Foscari Di Venezia, Italy
- Alexander Gelbukh, National Polytechnic Institute, Mexico
- Alexandros nanopoulos, University Of Hildesheim, Germany
- Alfredo Cuzzocrea, University Of Calabria, Italy
- Anastasios Dimou, Informatics And Telematics Institute, Greece
- Andreas König, TU Kaiserslautern, Germany
- Annalisa Appice, Università Degli Studi Di Bari, Italy
- Arnab Bhattacharya, Indian Institute of Technology, Kanpur, India
- Archil Maysuradze, Moscow State University, Russia
- Carson K. Leung, The University of Manitoba, Canada
- Chao Luo, University Of Technology, Sydney, Australia
- Christos Makris, University Of Patras, Greece
- Dan Wu, University Of Windsor, Canada
- Daniel Kudenko, University Of York, United Kingdom
- Daniel Pop, University Of The West Timisoara, Romania
- Daniela Zaharie, Uvt, Romania
- Daqiang Zhang, Nanjing University Of Aeronautics And Astronautics, China
- Dimitrios Katsaros, University Of Thessaly, Greece
- Dora Souliou, National Technical University Of Athens, Greece
- Edward Hung, Hong Kong Polytechnic University, Hong Kong
- Eugenio Cesario, ICAR - CNR, Italy
- Evangelos Theodoridis, University Of Patras, Greece
- Francesco Folino, University Of Calabria, Italy
- George Pallis, University Of Cyprus, Cyprus
- George Tambouratzis, Institute For Language And Speech Processing, Greece
- Hidenao Abe, Shimane University, Japan
- Ingrid Fischer, University Of Konstanz, Germany
- Ioannis Kopanakis, Technological Educational Institute Of Crete, Greece
- Jason Wang, New Jersey Institute Of Technology, USA
- Jihong Guan, Tongji University, China
- John Kouris, University Of Patras, Greece
- Junjie Wu, Beijing University Of Aeronautics And Astronautics, China
- Justin Dauwels, Massachusetts Institute of Technology, USA
- Katia Kermanidis, Ionian University, Greece
- Keiichi Horio, Kyushu Institute Of Technology, Japan
- Khalid Saeed, AGH University of Science and Technology, Poland
- Laura Spinsanti, EPFL, Switzerland
- Lefteris Angelis, Aristotle University Of Thessaloniki, Greece
- Lei Yang, Iowa State University, USA
- Liang Chen, Amazon.com, USA
- Lipo Wang, Nanyang Technological University, Singapore