

# Editorial

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The first issue of *CIT's* Vol. 24 consists of seven papers from areas covering a range of topics in computer science, namely theory of computation, operations research, computer networks, decision support systems, clustering application and natural language processing.

In the first paper titled *Inductive Data Types Based on Fibrations Theory in Programming*, Decheng Miao, Jianqing Xi, Yubin Guo and Deyou Tang examine semantic properties of inductive data types like fibred, single-sorted indexed and many-sorted indexed ones. Syntax construction and semantics of inductive data types in programming by fibrations theory are investigated in order to build semantic models of fibration, represent their inductive rules with universality by adjoint functors and their adjunction properties, thus providing a succinct and uniform descriptive way for semantics computation and program logic in programming.

The paper titled *The Monotonic Cost Allocation Rule in Steiner Tree Network Games* by Darko Skorin-Kapov deals with the cost allocation of network enterprise in which services are delivered from the source to a number of users via the minimum cost Steiner Tree Network (STN). As finding the optimal STN is an NP-hard problem, a spanning tree based heuristics is used. By formulating the associated STN game, the author proposes a new game theoretic cost allocation rule. The rule provides an easily computable population monotonic cost allocation solution which encourages users to cooperate and support network growth.

Rohit Singh, Himadri Nath Saha, Debika Bhattacharyya and Pranab Kumar Banerjee describe in their paper *Administrator and Fidelity Based Secure Routing (AFSR) Protocol in MANET* a secure proactive routing protocol which is based on an administrator node and a centralized mechanism ensuring fidelity and willingness of communication, thus mitigating various security threats characteristic for mobile ad hoc networks. Although possessing a higher End-to-End delay, the AFSR protocol shows a greater packet delivery fraction (PDF) and lower normalized routing load (NRL), this tradeoff helping make it secure at a lower cost of packet transmission, lower overhead and lower battery consumption.

The following two papers tackle issues in decision support systems. The first of them, *Improving the Reliability of Decision-Support Systems for Nuclear Emergency Management by Leveraging Software Design Diversity* by Tudor B. Ionescu and Walter Scheuermann introduces an innovative method for verification of simulation software used in decision-support systems for critical applications which is illustrated on a nuclear emergency management system. The rigorous validation of their approach provided in the paper indicates that the method has already reached a significant maturity.

The other paper, namely *Knowledge-based Systems and Interestingness Measures: Analysis with Clinical Datasets* by Jabez J. Christopher, Khanna H. Nehemiah and Kannan Arputharaj brings an experimental analysis of classification rule interestingness measures, with the aim to analyze factors influencing the efficiency and design of medical knowledge based systems. This paper examines pitfalls in the design of knowledge bases, and provides guidelines and suggestions for designing efficient computer aided diagnosis systems. The concepts presented are experimentally verified over benchmark medical datasets.

Materialized views (MVs) within database systems are used to improve database performance. To lower the number of MVs and expand their coverage, query grouping is used. In their paper titled *Application of Clustering Algorithm CLOPE to the Query Grouping Problem in the Field*

*of Materialized View Maintenance* Kateryna Novokhatska and Oleksii Kungurtsev describe their research on reducing the computational complexity of query grouping tasks and improving the quality of created MVs. To solve this problem, the authors propose an extension of the clustering algorithm CLOPE, which is obtained by considering statistical indicators of query execution during the formation of clusters, eventually allowing for the creation of MVs for the most frequently used queries.

The last paper in this issue is the one by Fatima Zahra Nejme, Siham Boulaknadel and Driss Aboutajdine, which describes a morphological analyzer for the Amazighe language, a Hamito-Semitic language spoken in North Africa. In *AmAMorph: Finite State Morphological Analyzer for Amazighe* the authors take the traditional and well proven approach to computational morphology and use finite-state technology to model the morphological processes, resulting in a comprehensive and robust analyzer within the NooJ linguistic framework covering both inflectional and derivational morphology of the standard Amazighe language.

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Editor-in-Chief