

EDITORIAL: DATA – ALGORITHMS – DECISION MAKING

MARTIN JANŽURA AND JIŘÍ IVÁNEK

The **DAR (Data – Algorithms – Decision Making) Research Centre** was established in 2005 with the support of the Ministry of Education, Youth and Sports of the Czech Republic under the Grant Number 1M0572. In general, the Centre is involved in fundamental and applied research in the fields connected with the development of models of uncertain knowledge and their application to systems for computer aided decision making. Global aim of the Centre is to contribute substantially to development of a unified theoretical, algorithmic and software background for solution of real-life problems and to provide tools for decision-making in complex situations based on different sources of knowledge. In particular, the Centre's research activities cover topics such as soft computing, decision making procedures and classification, image fusion, knowledge processing, multi-dimensional data modelling and recognition, multi-agent decision making, transportation problems, and linguistic data processing.

The Centre is coordinated by the Institute of Information Theory and Automation, Academy of Sciences of the Czech Republic, Praha (ÚTIA). The other partners are from three Czech universities and six industrial companies:

- West Bohemian University, Faculty of Applied Science, Plzeň
- Technical University, Faculty of Electrical Engineering and Communication technologies, Brno
- University of Ostrava, Institute for the Research and Applications of Fuzzy Modelling
- Empo, Praha
- Compureg, Plzeň
- ELTODO, Transport Systems Company, Praha (till 2009)
- OASA Computers, Ostrava
- Telefónica O2 Business Solutions, Praha (as DELTAX Systems Company till 2009)
- ŠKODA AUTO, Mladá Boleslav (since 2010)

Based on positive evaluation in 2009, the project of the Centre was extended till 2011 with the research aims that continue those accomplished in the basic period 2005–2009. The findings are in detail described in the annual reports that are also accessible at the Centre's web pages, <http://dar.site.cas.cz>.

Naturally, the outcomes of the research activities are continuously published in conference proceedings, scientific journals and books. Records on all publications are available at <http://dar.site.cas.cz> (in 2010, e. g., there are 5 book chapters, 18 journal papers, 73 conference contributions, 1 volume of proceedings and 8 technical reports).

The present issue contains selected representative results achieved by the involved researchers during the existence of the Centre. The capacity of one journal volume can hardly contain the Centre's research activity in its completeness.

The area of **knowledge processing and artificial intelligence** is covered by the papers:

Rank of Tensors of ℓ -out-of- k functions: An application in probabilistic inference by *Jiří Vomlel*

Entropies of vague information sources by *Milan Mareš*

Model of adaptation under indeterminacy by *Cyril Klimeš*

The **transportation problems** are represented by

Nonlinear Bayesian state filtering with missing measurements and bounded noise and its application to vehicle position estimation by *Lenka Pavelková*

The problems of **decision making** in a broad sense are represented by

Particle filter with adaptive sample size by *Ondřej Straka and Miroslav Šimandl*

Improving feature selection process resistance to failures caused by curse-of-dimensionality effects by *Petr Somol, Jiří Grim, Jana Novovičová and Pavel Pudil*

Fast accurate methods of independent component analysis: A survey by *Petr Tichavský and Zbyněk Koldovský*

The remaining papers stand for the area of **image modelling and processing**:

Multichannel deblurring of digital images by *Michal Šorel, Filip Šroubek and Jan Flusser*

Fusion based analysis of ophthalmologic image data by *Jiří Jan, Radim Kolář, Libor Kubečka, Jan Odstrčilík and Jiří Gazárek*

Probabilistic mixture-based image modelling by *Michal Haindl, Vojtěch Havlíček and Jiří Grim*

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Martin Janžura, Institute of Information Theory and Automation – Academy of Sciences of the Czech Republic, Pod Vodárenskou věží 4, 182 08 Praha 8. Czech Republic.

e-mail: janžura@utia.cas.cz

Jiří Ivánek, Institute of Information Theory and Automation – Academy of Sciences of the Czech Republic, Pod Vodárenskou věží 4, 182 08 Praha 8. Czech Republic.

e-mail: ivanek@utia.cas.cz