mefanet | MEDICAL FACULTIES NETWORK

MEFANET 2015 CONFERENCE

Jednání KR MEFANET

25.11.2015

mefanet 2015

Brno, Listopad 2015

Zápis z minulého jednáni

- Mezinárodní projekt CROESUS - vyškolení PBL tutoři
  - Kdo má seriózní a závazný zájem o PBL školení pod vedením odborných zahraničních lektorů, nahlásí se J. Majerníkovi

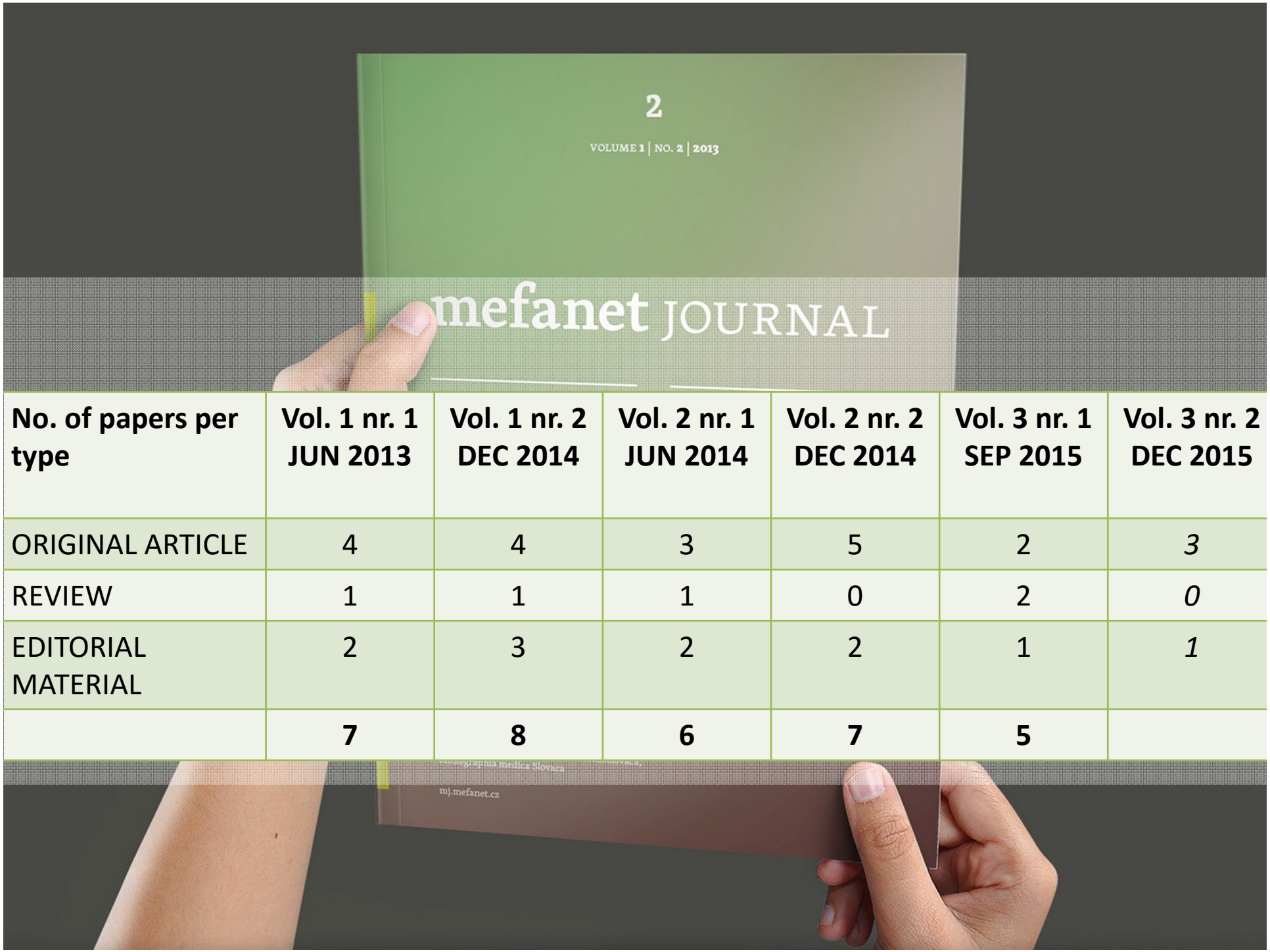
CRP projekt

- Podpora standardizovaného hodnocení znalostí studentů na vysokých školách

- Koordinace 1. LF UK (prof. S. Štípek a kol.)

MEFANET Journal

- Představení posledního čísla časopisu
- Distribuce tištěného vydání [vol.3 nr.2] na fakulty
- Call for papers
- Call for editorials

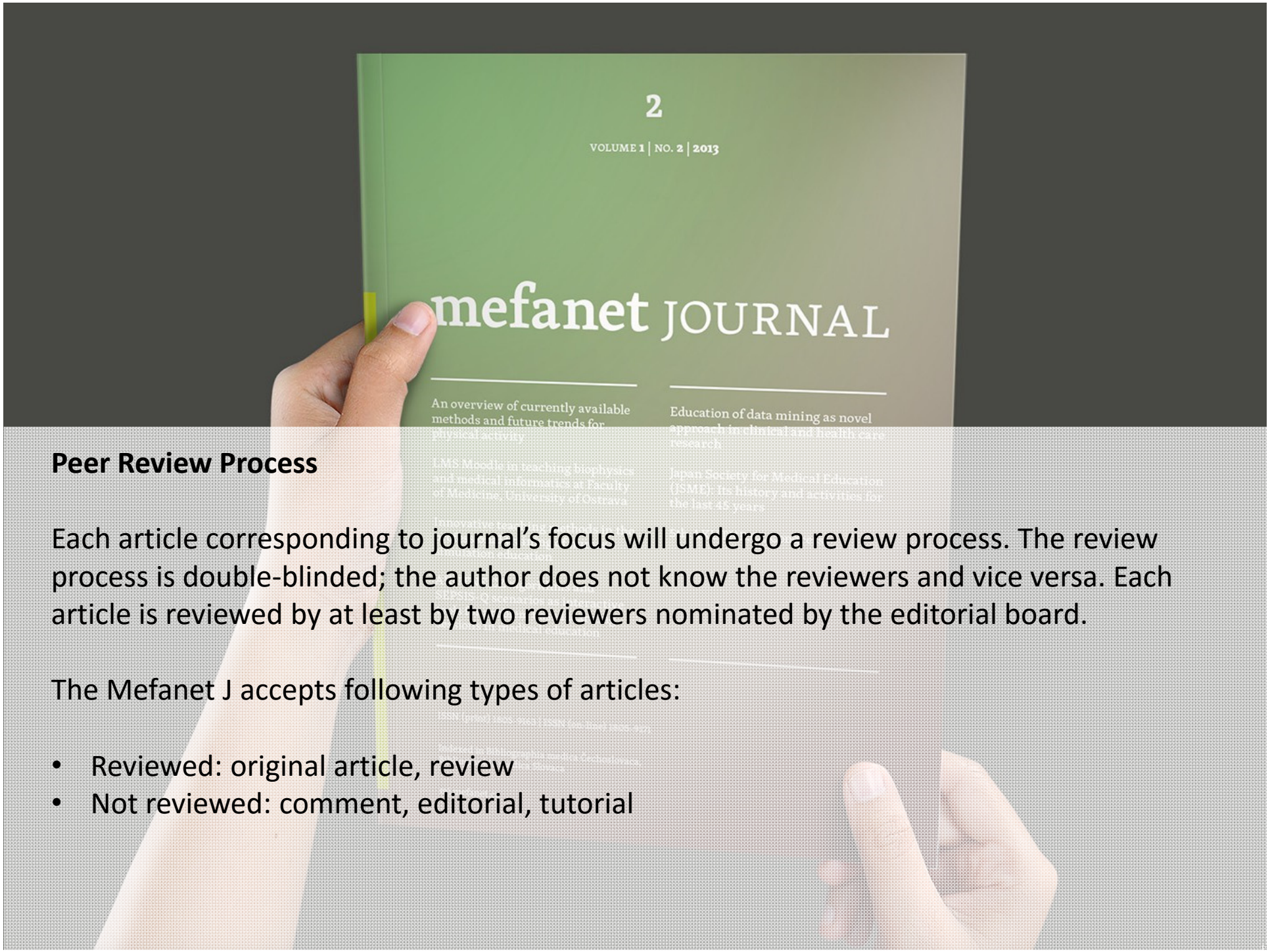


No. of papers per type	Vol. 1 nr. 1 JUN 2013	Vol. 1 nr. 2 DEC 2014	Vol. 2 nr. 1 JUN 2014	Vol. 2 nr. 2 DEC 2014	Vol. 3 nr. 1 SEP 2015	Vol. 3 nr. 2 DEC 2015
ORIGINAL ARTICLE	4	4	3	5	2	*3*
REVIEW	1	1	1	0	2	*0*
EDITORIAL MATERIAL	2	3	2	2	1	*1*
	7	**8**	**6**	**7**	**5**	

Scope of the journal

Manuscripts are invited which deal with the following topics:

- E-health and telemedicine
- E-learning
- Information science
- Innovative teaching methods
- Medical educational informatics and learning analytics
- Modelling and simulation
- Multimedia
- Social media pedagogy
- Evidence-based medicine in education

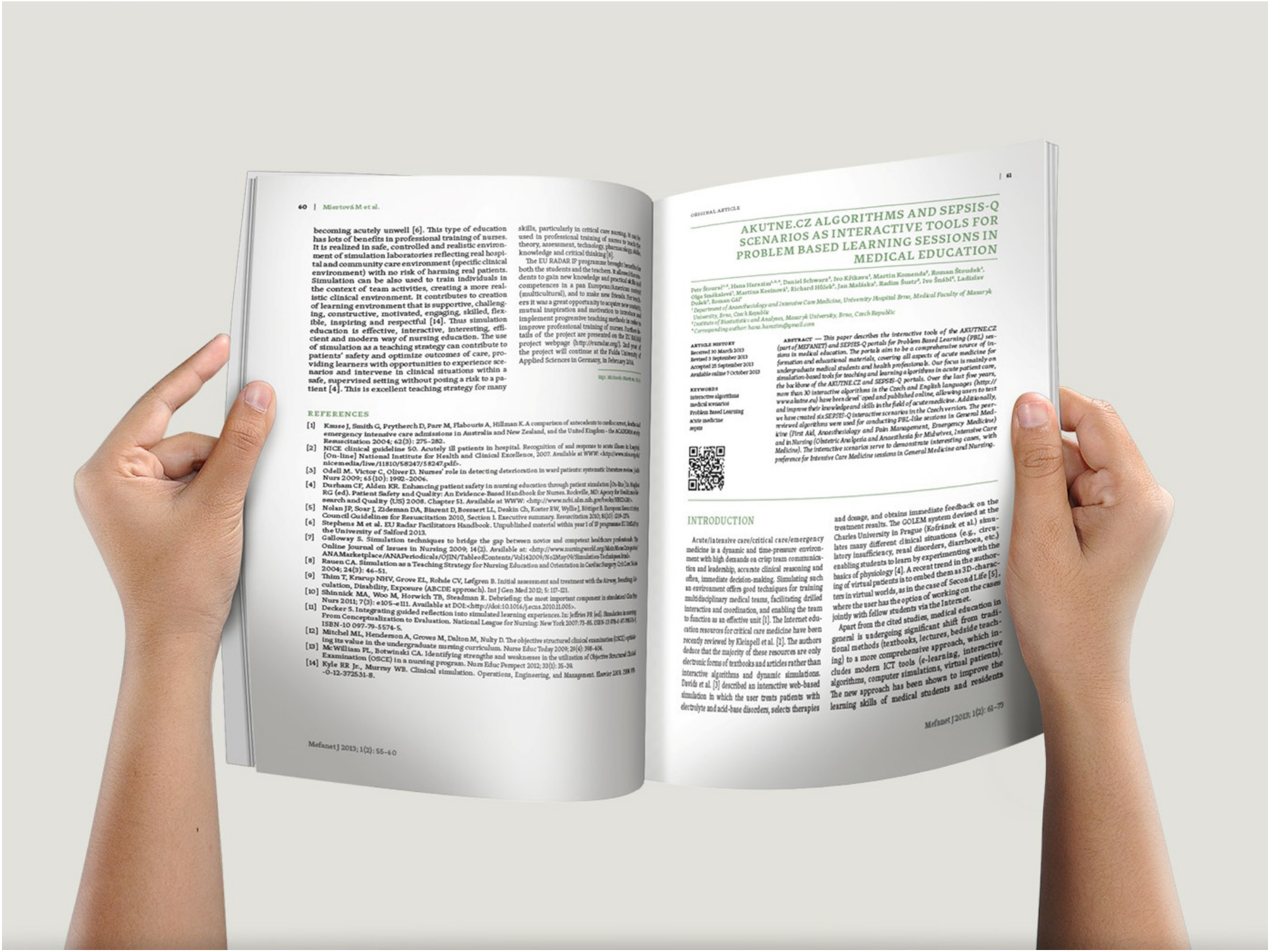


Peer Review Process

Each article corresponding to journal's focus will undergo a review process. The review process is double-blinded; the author does not know the reviewers and vice versa. Each article is reviewed by at least by two reviewers nominated by the editorial board.

The Mefanet J accepts following types of articles:

- Reviewed: original article, review
- Not reviewed: comment, editorial, tutorial



becoming acutely unwell [6]. This type of education has lots of benefits in professional training of nurses. It is realized in safe, controlled and realistic environment of simulation laboratories reflecting real hospital and community care environment (specific clinical environment) with no risk of harming real patients. Simulation can be also used to train individuals in the context of team activities, creating a more realistic clinical environment. It contributes to creation of learning environment that is supportive, challenging, constructive, motivated, engaging, skilled, flexible, inspiring and respectful [14]. Thus simulation education is effective, interactive, interesting, efficient and modern way of nursing education. The use of simulation as a teaching strategy can contribute to patients' safety and optimize outcomes of care, providing learners with opportunities to experience scenarios and intervene in clinical situations within a safe, supervised setting without posing a risk to a patient [4]. This is excellent teaching strategy for many skills, particularly in critical care nursing. It can be used in professional training of nurses to teach the theory, assessment, technology, pharmacology skills, knowledge and critical thinking [6].

The EU RADAR IP programme brought benefits to both the students and the teachers. It allowed students to gain new knowledge and practical skills and competences in a pan European/American context (multicultural), and to make new friends. For teachers it was a great opportunity to acquire new contacts, mutual inspiration and motivation to introduce and implement progressive teaching methods in order to improve professional training of nurses. Further details of the project are presented on the EU RADAR project webpage (http://euradar.org/). 2nd year of the project will continue at the Fulda University of Applied Sciences in Germany, in February 2014.

Mgr. Michaela Miertová, PhD.

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ORIGINAL ARTICLE

AKUTNE.CZ ALGORITHMS AND SEPSIS-Q SCENARIOS AS INTERACTIVE TOOLS FOR PROBLEM BASED LEARNING SESSIONS IN MEDICAL EDUCATION

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ABSTRACT — *This paper describes the interactive tools of the AKUTNE.CZ (part of MEFANET) and SEPSIS-Q portals for Problem Based Learning (PBL) sessions in medical education. The portals aim to be a comprehensive source of information and educational materials, covering all aspects of acute medicine for undergraduate medical students and health professionals. Our focus is mainly on simulation-based tools for teaching and learning algorithms in acute patient care, the backbone of the AKUTNE.CZ and SEPSIS-Q portals. Over the last five years, more than 30 interactive algorithms in the Czech and English languages (http://www.akutne.eu) have been developed and published online, allowing users to test and improve their knowledge and skills in the field of acute medicine. Additionally, we have created six SEPSIS-Q interactive scenarios in the Czech version. The peer-reviewed algorithms were used for conducting PBL-like sessions in General Medicine (First Aid, Anaesthesiology and Pain Management, Emergency Medicine) and in Nursing (Obstetric Analgesia and Anaesthesia for Midwives, Intensive Care Medicine). The interactive scenarios serve to demonstrate interesting cases, with preference for Intensive Care Medicine sessions in General Medicine and Nursing.*

INTRODUCTION

Acute/intensive care/critical care/emergency medicine is a dynamic and time-pressure environment with high demands on crisp team communication and leadership, accurate clinical reasoning and often, immediate decision-making. Simulating such an environment offers good techniques for training multidisciplinary medical teams, facilitating drilled interaction and coordination, and enabling the team to function as an effective unit [1]. The Internet education resources for critical care medicine have been recently reviewed by Kleinpell et al. [2]. The authors deduce that the majority of these resources are only electronic forms of textbooks and articles rather than interactive algorithms and dynamic simulations. Davids et al. [3] described an interactive web-based simulation in which the user treats patients with electrolyte and acid-base disorders, selects therapies and dosage, and obtains immediate feedback on the treatment results. The GOLEM system devised at the Charles University in Prague (Kofránek et al.) simulates many different clinical situations (e.g., circulatory insufficiency, renal disorders, diarrhoea, etc.) enabling students to learn by experimenting with the basics of physiology [4]. A recent trend in the authoring of virtual patients is to embed them as 3D-characters in virtual worlds, as in the case of Second Life [5], where the user has the option of working on the cases jointly with fellow students via the Internet.

Apart from the cited studies, medical education in general is undergoing significant shift from traditional methods (textbooks, lectures, bedside teaching) to a more comprehensive approach, which includes modern ICT tools (e-learning, interactive algorithms, computer simulations, virtual patients). The new approach has been shown to improve the learning skills of medical students and residents

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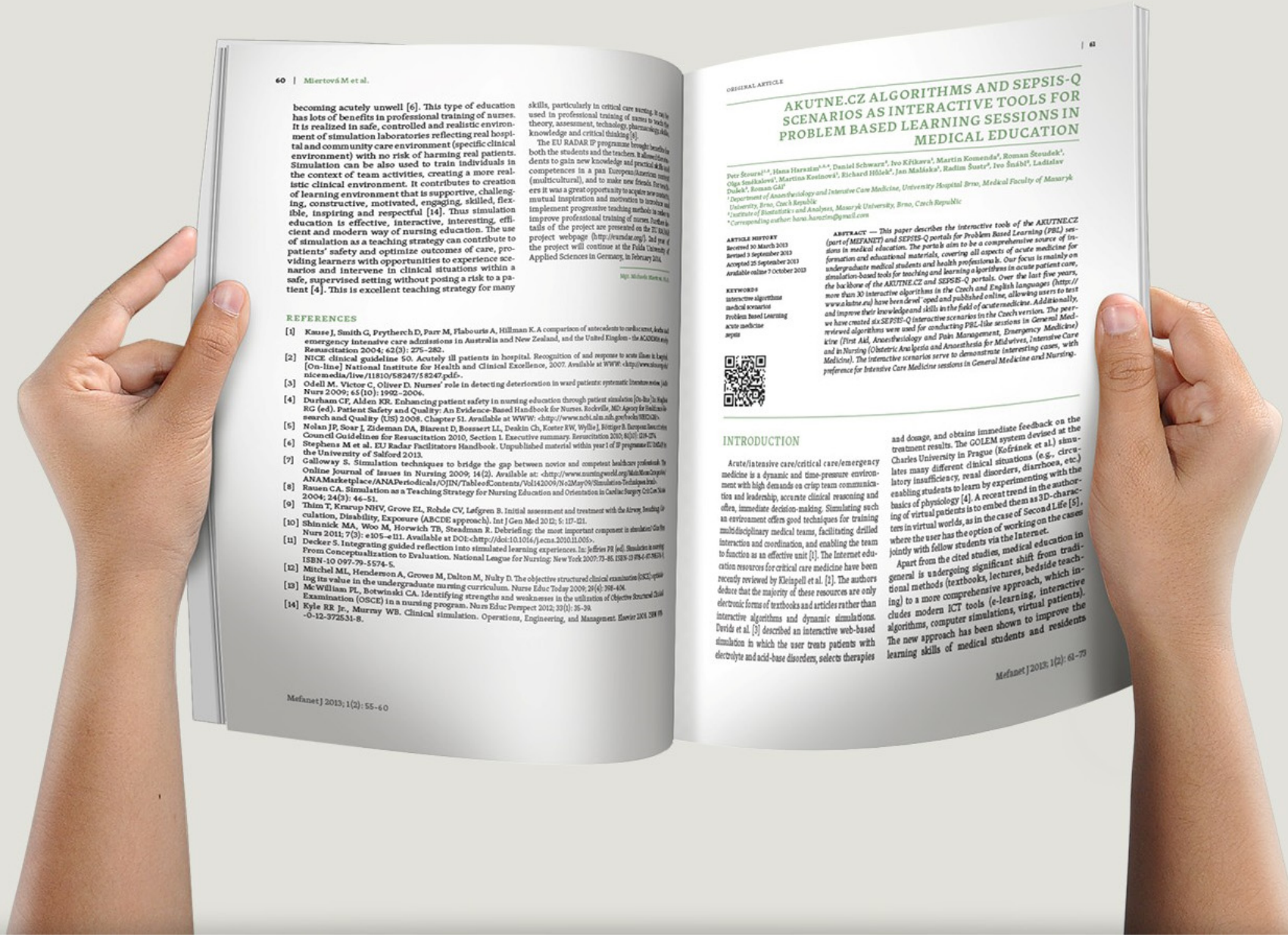

http://mj.mefanet.cz

74 | ORIGINAL ARTICLE

EDUCATION OF DATA MINING AS A NOVEL APPROACH IN CLINICAL AND HEALTH CARE PRACTICE

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data mining
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ABSTRACT — *Data mining (DM) is a widely adopted methodology for the analysis of large datasets which is on the other hand often overestimated or incorrectly considered as a universal solution. This statement is also valid for clinical research, in which large and heterogeneous datasets are often processed. DM is presented as standard methods available in common statistical software and combined together into a complex workflow methodology covering all the steps of data analysis from data acquisition through pre-processing and data analysis to interpretation of the results. The whole workflow is aimed at one final goal - to find any interesting, non-trivially hidden and potentially useful information. This innovative concept of data mining was adopted in our educational course of the Faculty of Medicine at the Masaryk University accessible from its e-learning portal http://portal.med.muni.cz/clanek-318-zavedeni-technologie-data-mining-a-analyzy-dat-genovych-expresnich-map-do-vyuky.html.*

INTRODUCTION

The term "data mining" (DM) is currently widespread in all areas related to data analysis. Clinical research belongs to them as well and the application of complex computational methods has become very popular in this area because of increasing amount of available data. The DM concept is nevertheless often overestimated or incorrectly considered as a universal solution for all problems. Although data mining seems to be well defined, the opposite is true. Even its definition is problematic and there are many definitions books and web portals dealing with the data mining. There are two probably the most popular definitions: "The nontrivial extraction of implicit, previously unknown, and potentially useful information from data" [1] and "The science of extracting useful information from large data sets or databases" [2].

In the article we would like to introduce our educational materials presenting concepts and approaches of data mining for clinicians and other researches in clinical and health care fields.

DM is mostly considered in the relation to large datasets; its usage in the commercial applications is common as well. In fact, the DM is universal methodology applicable to any data analysis and it is not "owned" by any area of science. The DM has been adopted in wide area of applications, such as stock ranking of risk clients, non-legal usage of credit cards, e-mail classification and spam messages detection, text and speech recognition or molecular data analysis. Therefore, the DM is the area of science whose development is multidisciplinary by its nature. Methods applicable in commercial applications can be applied in any other research areas and vice versa.

Data mining is often connected to an idea of gaining machine mining previously unknown information from the data and the methodology is often presented as a "black box" with simplified description. The reality is of course more rational. Good knowledge of mathematical background of the DM methods and their limitations is crucial for the correct application of the DM; the most important is expert knowledge and long-term experience. Methods applied in the DM are principally multivariate and here is valid all rules of multivariate data analysis. The benefits of multivariate methods are as follows [3]:

- Visualization of data with multiple variables
- Searching of meaningful views on multivariate data, identification of importance and hierarchy of variables
- Identification of correlations among variables, simplification of their structure
- Analysis of similarities between analysed subjects, their stratification, classification and predictionn

The question is whether the data mining is in any way different from the commonly adopted statistical methods? The answer is both yes and no. DM uses methods available in common statistical packages and "mining" can be sometimes used as a marketing term only. On the other hand, even common statistical methods are used in novel, complex and logically joined context. The real DM is a standardized complex methodology covering all the steps of data analysis from data acquisition through pre-processing and data analysis to interpretation of the results; the example is CRISP-DM, JDM (Java Data Mining) or complex methods of model description such as PMML (Predictive Model Markup Language). The data mining thus brings new quality in data analysis which is more related to innovative combination of methods than to any single method. DM in the hands of experienced data analyst is an important tool of scientific data analysis to be applied on complex heterogeneous multivariate data.

The workflow of data mining can be separated into simple individual steps from data storage and preprocessing to their description and predictive modelling. The individual steps can be performed in various software, such as Statistica, SPSS, SPSS Modeler, S+, Matlab, WEKA or R.

METHODS

Workflow of data mining

As already mentioned, data mining can be considered as an innovative connection of various methods of multivariate data analysis. Methodology of the complex DM approach always incorporates process workflow of analytical steps. Example of such approach is the CRISP DM methodology describing life cycle of DM project and their interconnections [4]; this methodology as one of the most general approaches available was also adopted in our article and educational materials.

According to CRISP-DM methodology the DM project life cycle consists of six phases; their order and direction of crossing between them is not strictly given and the movement in the scheme is based on the results of the previous phase (the arrows in the scheme shows the most common paths). The outer circle symbolizes cyclical nature of data analysis which is

Figure 1: DM workflow according to CRISP-DM methodology (taken from CRISP-DM)

repeated until the solution is found. The knowledge gained in one cycle can generate new questions and new cycles utilizing experiences from the previous cycles.

Understanding

This initial phase focuses on understanding the analysis objectives and requirements, and then converting this knowledge into a data mining problem definition and a preliminary plan designed to achieve the objectives. For example, in clinical data analysis this is the preliminary phase of literature review of given clinical problem (terminology, cut-offs, known correlations of variables etc.). Although it looks rather simple, this information is strategically important during the multivariate analysis. Limited knowledge on importance and meaning of variables can resulted into biased or uninterpretable results and during multivariate analysis these problems should not be necessarily revealed. Pa
preliminary phase should be also the powe
and assessment of the necessary sample siz

Data Understanding

The data understanding phase starts with an i
data collection and proceeds with activities in or
to get familiar with the data, to identify data qua
problems, to discover first insights into the data,
to detect interesting subsets to form hypotheses fo
hidden information. Wide set of univariate and mul-
tivariate analyses can be adopted for this exploratory
analysis (Figure 2).

Nové projekty & výzvy

- Nové projekty na fakultách?
  (RP, CRP, Erasmus+ aj.)

- Jak se mohou partnerské fakulty sítě MEFANET aktivně zapojit do projektů?

A.O.B.

- Zhodnocení konference zpětně dotazníkovým šetřením on-line
- „Topical session“ 2015: ***Technology-enhanced learning in neuromedicine specialities***
- „Topical session“ 2016: ***???***

- Jednání děkanů LF ČR a SR: ***???***
- Žádosti lékařů – profesionálů o přístup k materiálům: ***standardizovaná odpověď***