Geologia Croatica
Journal of the Croatian Geological Survey and the Croatian Geological Society
2017 | 70/2 | 71 |
www.geologia-croatica.hr

8th Croatian-Hungarian and 19th Hungarian geomathematical congress

doi: 10.4154/gc.2017.11

Dear Colleagues,

It is our pleasure to present to you a selection of papers from the Croatian-Hungarian conference held in May 2016 in Trakošćan. Geomathematics covers a wide range of mathematical applications in geosciences, ranging from simple data analysis to complex multivariate analysis, mapping algorithms, uncertainty analysis and neural networks.

Many regard Geomathematics as a new discipline, which is quite far from the truth. In general, handling geological data in the modern world is fairly difficult without a certain amount of mathematical knowledge. This is extremely evident when geoscientists are handling large numbers of data for interpretation, regardless of whether that data was acquired by state of the art seismic investigations or in the form of a large number of samples obtained by a geologist in the field with a hammer. Most of us use geomathematics in one way or another at some point in our research.

For popularization of geomathematics amongst geoscientists, a Geomathematical section was formed within the Croatian Geological Society in 2007. The 1st Croatian-Hungarian geomathematical congress was organized shortly after in 2008, alongside the 12th Hungarian geomathematical congress which was already established as a traditional one. For the first few years, this meeting was organised solely in Hungary until the 4th Croatian-Hungarian geomathematical and 15th Hungarian geomathematical congress were held in Opatija in 2014. Two years later, Opatija was the location again, and four years later in Trakošćan. This affirms the conference as a traditional one which is organised every other year in Croatia under the Croatian Geological Society, with the Geomathematical section as the main organizer.

This special issue comprises several scientific papers from various fields of geology (petroleum geology, petrophysics, sedimentology and hydrogeology) and with different applications of geomathematics presented with a goal to raise interest in such applications to both seasoned geologists and young specialists.

In the case of possible characterization of deep water clastic depositional systems in the Pannonian Basin, Horváth et al. from the University of Szeged, used cluster analysis to define genetically similar lithological units. The goal of their study was, not only to form them into clusters, but also, to observe the distribution in the 3D modelled space. A group of authors from INA (in the Oil Industry), led by Novak-Zelenika, presented their investigation of the petrophysical characterisation and modelling of reservoirs by the application of deterministic and stochastic methods. The study showed that selection of the method for defining the spatial distribution of the petrophysical properties (deterministic and stohastic) has a significant influence on the applicability of the geological model in defining areas of high risk, and it also has an influence on dynamic modelling complexity. Cvetković, from the Faculty of Mining, Geology and Petroleum Engineering regarded possible mathematical applications for well log data correlation in an effort to reduce the subjectivity of the classical „motif observation" approach which indicated the usability of plotting trend curves of standard deviation values of well log data. An article covering the application of geomathematics to geological problems is that by Koroncz et al. from the GEOCHEM and RAG laboratories in Hungary. In contrast to the three, previous works which handle the application of geomathematics on a larger scale, the problems highlighted here relate to the domain of petrophysical properties in a sample size dataset. The authors provided an approach for determining the petrophysical properties of shales for better definition of velocity propagation data for seismic depth migration and to show the correlation of porosity concerning effective stress value. In the final article, a group of authors from the Faculty of Mining, Geology and Petroleum Engineering addressed the quality of potable water in the Zagreb aquifer. Kovač et al. applied multivariate statistical analyses to testing the relationships of water parameters and allocating them using cluster analysis.

We hope that this selection of original scientific articles provides new understanding of the usefulness of geomathematical approaches and incites some of you to apply geomathematics to your area of expertise.

Marko Cvetković, Issue Editor
Lidija Galović, Editor-in-Chief