

FAST AND EFFICIENT USE OF DATA

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ABSTRACT

The presence of large amount of data collected both via digitalization and via sensors has given new challenges related to the use of these. These are related to the use of these data in order to create, validate and/or complete the mathematical description of the phenomena under observation.

The presence of new data collections, thus, has opened new perspectives to mathematical research. The reality that surrounds us is measured in order to be analysed. This analysis should serve to predict future behaviour and analyse current functioning. Forecasting and monitoring are the keywords. The challenges relate to unknown cases, including rare events, and these can be tackled only if the results are accurate and efficiently produced.

The season we live in is that of data-based modelling. Descriptive statistics and numerical analysis of the physical model are combined with the possibility of describing in the absence of a model even in a predictive manner. One of the challenges for applied mathematics is to use this information while ensuring the accuracy of the predicted result. This means introducing deviation measures that can adapt to the type of data and know how to explore the complexity of the same. But it also means using suitable mathematical tools for the description of measured reality. The accuracy of the modeling and the possibility of generating the results must also be measured starting from the type of application. Accurate estimates of what done by the simulation also determine the study of efficient methods, which then return real-time information, perhaps based on pre-calculated information. Often a fast answer, even if it only gives an indication, may be the best possible one.

This symposium accepts contributions that employ techniques to use efficiently measured data. We encourage works ranging from the mathematical foundations of these methods to their industrial applications.