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Estimation of Psychological Personality Factors by Combining Different Tests. Bayesian Networks

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In the past 30 years, interest in the theory and practice of Bayesian networks has extremely increased in various fields of science. This can be explained by very promising results obtained with the Bayesian network models in various scientific fields: medicine, genetics, sociology and psychology.

Psychological and sociological tests are very popular; the applicability area is huge, from marriage agencies to military units. Psychologists and sociologists are constantly working on improvement of the quality and the informativity of their tests. To provide reliable and accurate conclusions/estimates, running of multiple tests may be required. An open question, which we research here, is how to combine various results of all these tests into one result. For this purpose we use Bayesian network graphs.

We made an attempt to extend Bayesian network methods for applications in psychology and sociology. Particularly, we develop new methods to estimate certain psychological characteristics on a basis of few psychological tests. It helps to describe psychological and social climate in a team.

For numerical computations we use the R programming environment.

Obtained results: We built the mathematical model with using Bayesian networks. This model explains the principle of constructing a general estimate of the psychological factor based on estimates from several tests. We made the corresponding computations, based on this model. The obtained estimate corresponds to the subjective assessments of experienced psychologists.

Possible application: to model and to forecast psychological/sociological compatibility of different people. This can be especially important for group of people in isolated locations or for military.

Future: for more complex tasks we will develop a Bayesian networks software toolbox in C# programming language. For large computations, we will use the processing power of NVIDIA GPUs with CUDA.

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