To:
The Board of Doctoral Study  
Faculty of Mathematics and Physics  
Charles University in Prague  

March 31st, 2016

Report on the PhD thesis by Juraj Moško

The research in multimedia exploration area is promising due to its indisputable benefits when accessing data where (structured) querying is insufficient. Various multimedia exploration concepts allow the user to navigate within a visualized space of data entities, so he/she could take into account also visual properties that cannot be defined a-priori in a database schema (attribute-value search).

In the thesis, the candidate discusses various problems concerning the multimedia exploration, in particular real-time processing of similarity queries within the exploration process and the architecture of an exploration system as a multimedia retrieval framework (Chapter 3). The real-time processing is inevitably important for multimedia exploration, because of interactive nature of the exploration process. Unlike querying, where the query is issued and a result is obtained after a decent delay, in the exploration process the intermediate results of underlying similarity queries must be evaluated instantly in order to keep the retrieval process smooth and not distracting (even entertaining). The candidate elaborates on this topic, experimenting with various metric indexes used for instant query processing.

Another contribution of the thesis is the MLES (multi-layer exploration structure), that was designed in order to support several exploration operations (zoom-in, zoom-out, pan). Besides the design details and basic experiments (Chapter 4), the MLES has been evaluated in a user study consisting of almost 100 users (Chapter 5).

The thesis demonstrates a considerable insight of the candidate into the problem, while the proposed contributions to the research area are significant. Besides the main contributions of the thesis, the Chapters 1-2 are valuable to an IT reader for a quick introduction into multimedia exploration topics.

The results presented in this thesis have been published in proceedings on a number of representative international conferences (ADBIS, CBMI, 2xSISAP, ADC) published by ACM/IEEE/Springer, and in Information Systems journal (Elsevier). In addition to these, the candidate was a co-author of several other publications (GECCO conference, SIGMOD Record journal).

Based on the evaluation above, I recommend the candidate Juraj Moško to obtain the PhD degree.

Doc. RNDr. Tomáš Skopal, Ph.D.  
supervisor