FACULTY
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AND PHYSICS
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Report on the PhD thesis by Tomáš Grošup

In the era of Big Data, the research in multi-modal (and multimedia) data exploration area is extremely relevant. Because of the abundance of data and its heterogeneity, complexity, dynamism and distributed storage, the models and methods for data retrieval become insufficient. This problem is often referred to as the data findability problem, in scenarios where huge amounts of data is available, but infeasible to access/process/understand. The multi-modal data exploration addresses some expects of the data findability by means of similarity search, visualization, query interfaces – all in multi-modal settings (where a data entity is described by multiple representations).

In the thesis, the candidate discusses the topics of multimedia and multi-modal data exploration by means of similarity search, visualization, analytics/aggregation and indexing. As his ultimate result, the candidate proposes a framework for visual attributes discovery, where relational attributes are being extracted from multimedia data (e.g., raster images) while a database scheme consisting of previously available attributes is augmented by these new visual attributes. All attributes are then ready to be accessed using standard relational-database technology, e.g., by SQL. The candidate demonstrates this concept on e-commerce product data, such as fashion products, that are truly multi-modal (include attributes like price, description, category, etc. along with product photos).

The thesis demonstrates a considerable insight of the candidate into the problem, while the proposed contributions to the research area are significant. Besides the contributions of the thesis, the Chapter 1 is valuable for a non-expert reader to get quickly oriented in multimedia/multi-modal data exploration topics.

The results presented in this thesis have been published in proceedings of several representative international conferences; CORE A (EDBT, CIKM), CORE B (2x ICMR, ADBIS) and others (CBMI, MMM) published by ACM/IEEE/Springer. A comprehensive paper was submitted to Information Systems journal (Elsevier, under review). In addition to these, the candidate was a co-author of several other conference publications (5x SISAP, 2x CBMI). In total, the candidate was a co-author of 15 publications that already received 56 citations at Google Scholar (H-index 5).

Based on the evaluation above, I **recommend** the candidate Tomáš Grošup to obtain the PhD degree.

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