

Data Modeling and Analytics for Advancements in Monitoring Next Generation Software Applications

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Abstract

Keywords:

1. Introduction

Monitoring and management of large scale data and applications have always been complex tasks, especially because the data is unstructured and often logged in applications in a syntactic manner. This makes it quite limited, requires manual interpretation and hence makes the process of monitoring and management slow, cumbersome, and hard.

2. Aim

This talk will present an overview of our proposed solution of data modeling in correlation with analytical techniques in order to improve monitoring and management process for large-scale data and applications.

3. Material and methods

We carry out semantic (i.e., highly structured, formalized and expressive) modeling of data, execution workflow and logs, and then build, customize and use Data Analytics techniques, in correlation with the semantically enriched data, to process the data that helps in automating the monitoring and management process. We have designed and developed our unique hybrid approach of partially using data modeling and description, as well as customized data analysis and social network analysis techniques to be able to automatically interpret and process the highly structured information from data and logs generated during the execution.

4. Results

Our proposed solutions are tested by applying them on different use-case applications which has resulted in efficient monitoring and management of such software applications by detecting errors, faults and exceptions in lesser time and manual work.

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5. Conclusions

Our proposed solutions combine the best characteristics of data modeling and data analytics and helps in improving the automated monitoring and management of data and applications at large-scale. The impact, usefulness and effectiveness of our solution have been demonstrated by applying it on industrial case-studies and scenarios.

6. Keywords

Data Modeling; Data Analytics; Software Applications; Execution; Monitoring

Author biography

Dr. M. Omair Shafiq Dr. M. Omair Shafiq is an Assistant Professor at the School of Information Technology, Carleton University, Canada. His research interests include Big Data Analytics, Machine Learning, Deep Learning, Data Modeling, and Cloud Computing. He received NSERC Postdoctoral Fellowship Award and Mitacs Elevate Postdoctoral Fellowship Award in 2015-2016 competitions, NSERC Vanier Scholarship in 2012, Alberta-Innovates Technology Futures (AITF) Scholarships for PhD and Master studies in 2011 and 2010, J.B. Hyne Research Innovation Award from University of Calgary in 2012, and Teaching Excellence Award from University of Calgary in 2011. He has published over 50 peer-reviewed publications in journals, book chapters, conferences and workshops, served in program committee of over 30 conferences and workshops, co-organized over 8 conference and workshops. He has also been collaborating with industry in North America, Europe, and Asia to build Big Data Analytics and Machine Learning based solutions and products.