
Editorial

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Welcome to V 17 N 4 issue of *IJWET*. This issue consists of four papers. The first paper is 'A framework for implementing micro frontend architecture', by Sylvester Timona Wanjala. The author argues that despite the progress brought to the design of applications' backend by the use of microservice architectures, the frontend still remained monolithic. According to the literature review, the micro frontend architecture has been proposed as an alternative and an excellent complement to micro services, and offered several benefits to its adopters, such as increased team independence, and reduction to the overall frontend complexity. However, they still have some shortcomings such as the increased application payload and code duplication, UX inconsistencies, etc., and require careful planning in order to succeed.

To address this, the author proposes an architectural framework for implementing micro frontends to address the challenges experienced from all the previous implementations and set a clear implementation strategy. In this strategy, they distinguish a list of micro-applications that cover various requirements, such as the functional or business related ones, the authentication, the layout and navigation, the application launch, etc. As a proof to the performance superiority of the proposed architecture, the author develops two applications, one using micro frontends in JavaScript and VueJS and the other using the monolithic approach. Using Google's Lighthouse for the evaluation of the two implementations they show that the micro frontends implementation outperformed the monolithic one in the time needed to paint the first content and is faster in displaying content during page load. Since the monolithic architecture loads the entire application during the initial load, it is still faster in the remaining metrics that examine the speed of changing between applications.

The second paper is 'A comprehensive review and open issues on energy aware resource allocation in cloud', by Shubham Singh, Pawan Singh and Sudeep Tanwar. The authors perform a literature review of the last decade's research works on energy aware cloud resource allocation techniques and analyse the various tools and workload management strategies adopted for resource allocation with an energy aware perspective. The resource allocation techniques examined are grouped into deep learning-based, game theory-based, optimisation algorithms, scheduling techniques, dynamic voltage and frequency scaling methods, fuzzy methods, and others. The authors in the reviewed literature have used several metrics to evaluate the performance of the various techniques, including the energy consumption, simulation time, SLA violation, CPU utilisation, cost and memory utilisation, delay, throughput, etc. In an attempt to highlight the pros and cons of each technique, the authors in this paper summarise the advantages

of the reviewed methods, which mainly comprise reduced energy consumption and reduced transmission delay and SLA violation rates, and the disadvantages that mainly comprise increased computation time, host overloading and time complexity. They also provide a list of the main tools used for the performance evaluation and the workloads used for such tasks. Concerning the latter, a large variety of workloads has been noticed, from heterogeneous and homogeneous to dynamic, independent, time-intensive, scalable and so on.

The third paper is 'Web applications testing techniques: a systematic mapping study', by Samer Hanna and Amro Al-Said Ahmad. In this article, the authors raise the importance of web application testing and perform a systematic mapping study in order to analyse this field. Following a concrete methodology for searching for relevant studies in the main scientific publication Fora, the authors identify 98 papers published between 2008 and 2021. The two main types of web application testing are model-based testing and security testing. However, more types such as mutation, random, combinatorial, performance testing and others have been found. According to the study, the most commonly used models in model-based testing are finite state machines (FSM), although more graph-based models are employed. Respectively, the main investigated vulnerability in security testing is structured query language (SQL) injection, while XML and MSS injection vulnerability are also investigated. The most commonly targeted testing goal is test automation, although test coverage and vulnerabilities exploitation rate are also examined. The research works either present case studies, experiments or prototypes and tools.

The fourth paper is 'Attention-based 3DTCN-LSTM short-term network traffic prediction model considering multi-base station spatiotemporal coupling', by Yuliang Zhan, Ji Zhou and Jiayi Zhang. The paper focuses on the network traffic prediction task, which is usually approached as a time series prediction problem. The work builds on the temporal convolutional network (TCN) model which is used for feature extraction and combined with the LSTM model for processing in order to improve the prediction of network traffic. The resulting 3DTCN-LSTM model based on the attention mechanism improves the prediction accuracy, since it is able to capture the spatial correlation caused by human mobility and extract long-distance and long-term correlations during spatiotemporal feature extraction.

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