

Guest Editorial: Special Issue from ISCA Fall--2022 SEDE Conference

This special issue of the International Journal of Computers and their Applications (IJCA) is a collection of four refereed papers selected from SEDE 2022: the 31st International Conference on Software Engineering on Data Engineering, held October 17-18, 2022. This conference, due to the pandemic, was held virtually.

Each paper submitted to the conference was reviewed by at least two members of the international program committee, as well as by additional reviewers, judging for originality, technical contribution, significance and quality of presentation. The proceedings for this conference can be found online at https://easychair.org/publications/volume/SEDE_2022. We had a very good keynote presentation from Dr. Jalal Kiswani entitled “Software Development: Past, Present, and Future” where he walked through the demand for better ways to do software development, which started with waterfall, then agile and iterative development, followed by components re-use, and lately, moving towards Rapid Application Development (RAD) approaches led by prototyping, low-code no-code tools, platforms, and frameworks.

After the conference, the four best papers were recommended by the program committee members to be considered for publication in this special issue of IJCA. The authors were invited to submit a revised version of their papers. After extensive revisions and a second round of review, these papers were accepted for publication in this issue of the journal.

The papers in this special issue cover a broad range of research interests in the community of computers and their applications. The topics and main contributions of the papers are briefly summarized below.

JAYESH SONI, NAGARAJAN PRABAKAR, and HIMANSHU UPADHYAY of Florida International University present their work “MLE-NET: A Multi-Layered Ensemble Approach for an Enhanced Anomaly Detection.” They start off by showing that anomaly detection is an important task in many areas. They then proposed a hybrid and ensemble multi-layered approach for robust anomaly detection in their work. The results showed that the hybrid and ensemble multi-layered approach outperforms state-of-the-art anomaly detection methods in terms of robustness and accuracy. They were also able to capture both local and global anomalies which is more comprehensive than traditional methods and has the potential to be applied in a variety of applications.

CHRISTOPHER LEWIS, and FREDERICK C HARRIS, JR. of the University of Nevada, Reno present their paper “Virtual Reality: An Overview, and How to do Typing in VR.” In this paper they present a brief history, current research areas, and areas for improvement in VR. They show that VR has many advantages and that there are a sizable number of deficits that VR needs to solve to be more widely adopted. They then provide some insight into successful typing methods for VR through the use of a user study and a comparison of input methods. It was found that a combination of dictation and a 3D input method led to better results than solely dictation. It was also found that testing input methods with multiple types of input (urls, email addresses, sentences, and

paragraphs) gave more varied and detailed results. They found that the addition of more varieties of text in researching typing methods is incredibly important as VR transitions from a novelty entertainment and scientific games platform to an interface that many people can use daily in their work.

BRADFORD A. TOWLE, JR. of Florida Polytechnic University in Lakeland Florida present his work entitled paper “Optimal Control Frequencies for large Number of Virtual Agents in Augmented Reality Applications.” In this work, he presents virtual agents (any entity within the program that must periodically run logic and has some graphical effect) and discusses the optimal control frequency for virtual agents across three common AR platforms (the HoloLens1, the HoloLens2, and the Android Note 8). Over the last several years large game engines, including Unity 3D and Unreal, have encouraged AR development. This study was developed with the UNITY 3D platform and the framerate was computed as the number of virtual agents increased. The differences between the hardware was well described and the results of the study showed the change in framerate as the number of agents is increased and the frequency of the updates is changed.

JOSHUA DAHL, ERIK MARSH, CHRISTOPHER LEWIS, AND FREDERICK C HARRIS, JR. of the University of Nevada, Reno present their paper “uMuVR: A Multiuser Virtual Reality and Body Presence Framework for Unity.” In this work they present a new framework for VR under Unity. They show that many frameworks were not designed to support mixed virtual and non-virtual interactions. Therefore, they developed a framework that that lays an extensible and forward-looking foundation for the development of mixed interactions based upon a novel method of ensuring that inputs, visuals, and networking can all communicate without needing to understand the others’ internals. They show that their framework provides utilities for representing user avatars in a physicalized manner while supporting a range of different input methods. They compare other frameworks, test networking and compression, and provide a clear separation of Inputs, Visuals, and Networking. Their examples and applications present avatars and voice communication across the multiuser VR environment.

As guest editors, we would like to express our deepest appreciation to the authors and the program committee members of the conference these papers were selected from.

We hope you will enjoy this special issue of the IJCA and we look forward to seeing you at a future ISCA conference. More information about ISCA society can be found at <http://www.isca-hq.org>.

Guest Editors:

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