

Editor's Note

The International Journal of Interactive Multimedia and Artificial Intelligence provides an interdisciplinary forum in which scientists and professionals can share their research results and report new advances on Artificial Intelligence and Interactive Multimedia techniques.

The research works presented in this issue are based on various topics of interest, among which are included: bayesian networks, evolutionary algorithms, virtual reality, web advertising, 3D technologies, traffic expression, Smart Cities, computational sustainability, computer vision, image recognition, deep neural networks, graphical models, mobile devices, human/complex system interactions, multi-agent systems, Physics inspired behaviours, etc.

Fukuda et al. [1] talks about bayesian network, which are regarded as one of the essential tools to analyze causal relationship between events from data. To learn the structure of highly-reliable Bayesian networks from data as quickly as possible is one of the important problems that several studies have been tried to achieve. In recent years, probability-based evolutionary algorithms have been proposed as a new efficient approach to learn Bayesian networks. In this paper, they target on one of the probability-based evolutionary algorithms called PBIL (Probability-Based Incremental Learning), and they propose a new mutation operator. Through performance evaluation, they found that the proposed mutation operator has a good performance in learning Bayesian networks data source for a certain activity.

Kalochristianakis et al. [2] presents a scene composition approach that allows the combinational use of standard three dimensional objects, called models, in order to create X3D scenes. The module is an integral part of a broader design aiming to construct large scale online advertising infrastructures that rely on virtual reality technologies. The architecture addresses a number of problems regarding remote rendering for low end devices and last but not least, the provision of scene composition and integration. Since viewers do not keep information regarding individual input models or scenes, composition requires the consideration of mechanisms that add state to viewing technologies. In terms of this work they extended a well-known, open source X3D authoring tool.

Silva et al. [3] writes about road traffic which is a problem which is increasing in cities with large population. Unrelated to this fact the number of portable and wearable devices has also been increasing throughout the population of most countries. With this advent, the capacity to monitor and register data about people habits and locations as well as more complex data such as intensity and strength of movements has created an opportunity to contribute to the general wealth and comfort within these environments. Ambient Intelligence and Intelligent Decision Making processes can benefit from the knowledge gathered by these devices to improve decisions on

everyday tasks such as deciding navigation routes by car, bicycle or other means of transportation and avoiding route perils. The concept of computational sustainability may also be applied to this problem. Current applications in this area demonstrate the usefulness of real time system that inform the user of certain conditions in the surrounding area. On the other hand, the approach presented in this work aims to describe models and approaches to automatically identify current states of traffic inside cities and use methods from computer science to improve overall comfort and the sustainability of road traffic both with the user and the environment in mind.

Raveane W. and González Arrieta, M. A., [4] introduce a hybrid system composed of a convolutional neural network and a discrete graphical model for image recognition. This system improves upon traditional sliding window techniques for analysis of an image larger than the training data by effectively processing the full input scene through the neural network in less time. The final result is then inferred from the neural network output through energy minimization to reach a more precise localization than what traditional maximum value class comparisons yield. These results are apt for applying this process in a mobile device for real time image recognition

Lal, N., [5] write about the mobile ad hoc network which is a wireless technology that contains high mobility of nodes and does not depend on the background administrator for central authority, because they do not contain any infrastructure. Nodes of the MANET use radio wave for communication and having limited resources and limited computational power. The Topology of this network is changing very frequently because they are distributed in nature and self-configurable. Due to its wireless nature and lack of any central authority in the background, Mobile ad hoc networks are always vulnerable to some security issues and performance issues. The security imposes a huge impact on the performance of any network. Some of the security issues are black hole attack, flooding, wormhole attack etc. In this paper, they will discuss issues regarding low performance of Watchdog protocol used in the MANET and proposed an improved Watchdog mechanism, which is called by I-Watchdog protocol that overcomes the limitations of Watchdog protocol and gives high performance in terms of throughput, delay.

Caicedo Acosta et al. [6] shows the implementation of mutual exclusion in PCBSD-FreeBSD operating systems on SMPng environments, providing solutions to problems like investment priority, priority propagation, interlock, CPU downtime, deadlocks, between other. Mutex Control concept is introduced as a solution to these problems through the integration of the scheduling algorithm of multiple queues fed back and mutexes.

Getcher et al. [7] talks about Multi-agent systems which are now wide spread in scientific works and in industrial applications. Few applications deal with the Human/Multi-agent system interaction. Multi-agent systems are characterized by individual entities, called agents, in interaction with each other and with their environment. Multi-agent systems are generally classified into complex systems categories since the global emerging phenomenon cannot be predicted even if every component is well known. The systems developed in this paper are named reactive because they behave using simple interaction models. In the reactive approach, the issue of Human/system interaction is hard to cope with and is scarcely exposed in literature. This paper presents Sphericall, an application aimed at studying Human/Complex System interactions and based on two physics inspired multi-agent systems interacting together. The Sphericall device is composed of a tactile screen and a spherical world where agents evolve. This paper presents both the technical background of Sphericall project and a feedback taken from the demonstration performed during OFFF Festival in La Villette (Paris).

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