

# Guest Editorial Preface

## Special Issue of Introduction of Advanced Theory and Application for Mobile Hybrid Information

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Mobile Hybrid Information (MHI) means a piece of mobile information which consisted of diversified types of information. For example, one piece of hybrid information may consist of both sound, illumination, temperature and different kinds of signals which are collected by multiple instruments for one target. With development of mobile technology today, MHI is used worldwide to collect information by different kinds of sensors. It is changing our life.

Therefore, it is important to consider much more things for a MHI system. For example, encoding, integration and transmission of hybrid information to users is an important research spot in this domain. Furthermore, diversified types of information need a hybrid database to store and hybrid system to process.

Though many researchers focus on this domain, there are more remaining issues are waiting for solving, both in theory and application. In order to provide an opportunity for researchers to publish their gifted theoretical and technological studies of emerging theory with MHI, as well as their novel engineering applications within this domain, this issue is provided with acceptance ratio 38.46%.

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### Introduction

At present, the Internet of Things has no standard system architecture. According to the requirements of universal sensing, reliable transmission, intelligent processing and the realization of human, the

Internet needs an open, hierarchical and extensible network architecture as the framework. Under this inspiration, A network security analysis algorithm that using genetic algorithm to optimize neural network was proposed in the first article. The learning results of the previous node and the current network state were used as parameters, and GA was used to judge node and sleep useless node. Simulation experiments of sensor data anomaly were carried out by using the traditional and proposed detection method. Experimental results showed that the recognition efficiency of the proposed security detection method was higher than that of the traditional method.

Pigaiwang was an automated writing evaluation (AWE) online platform, and its mobile application had been increasingly applied into English writing scoring in China. The second article conducted research to empirically assess the reliability and validity of Pigaiwang based on mobile networks. It firstly introduced the background and previous works for AWE. Then, an experiment was implemented to evaluate the reliability and validity of Pigaiwang automated evaluation by comparing with the results of human raters and corpus-based assessment. The results showed that Pigaiwang alone was not an adequate aid for English writing evaluation. It suggested that combining Pigaiwang, human raters and corpus might be a beneficial trial for improving English writing mobile education.

At present, most of the sports training and teaching systems had problems in relatively narrow scope of teaching content, which lacked of communication between teachers and students, such as long response time of the system. In order to solve these problems, an online sports training teaching system based on mobile multimedia communication platform was proposed in the third paper. The online sports training teaching system realized networked student learning and teacher-student exchange. Moreover, response time of the system was tested. Experimental results showed our proposed method verified effectiveness of the system and achieved the purpose of this paper.

The forth article proposed a Python-based online learning user trajectory tracking method by aiming at the problem that the precision and recall rate, as well as the prediction efficiency of traditional prediction methods were low. Troubleshooting of online learning user terminal were programed by Python structure. The online learning user trajectory data was spatially processed, and its features of time-related, spatial correlation, social relationship correlation as well as user preference properties were extracted respectively to realize feature normalization processing. Experimental results showed that the proposed method did not only improve the prediction efficiency, but also obtained higher and more feasible precision and recall rate by normalized the user's trajectory and combined the time segment.

In the fierce competition of the enterprise market, the human resource allocation of enterprises will face multiple risks. The last article took the connotation of human resource configuration management as the research object and established the human resource configuration model through SOM neural network. The model was trained, learned and tested by public open source data. What's more, it was applied to human resources management to adjust the allocation of human resources for the enterprise in a timely manner. It provided a detailed basis for proposing coping strategies and has a great application value.

## CONCLUSION

MHI has variety of applications in mobile communication and computing today, and has acted as an important research domain in data processing and computing, especially in long distance communication.

Such discussion in this issue with great diversity and a broad scope have provided many solution methods of many different problems in MHI, such as effective computing framework; compression and encoding; information restoration; big data processing. Furthermore, application of MHI also had been provided with specified hybrid data.

However, we will need more time and hard work in this important research domain. Indeed, more effective theories and applications are needed to solve in this area. More sophisticated and robust

application is important in specified MHI communication. However, more improvement of framework and information processing in MHI system with higher efficiency are also need deeper study.

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