Cognitive Computing for Intelligence Systems

Huimin Lu[1] · Yujie Li[2]

Cognitive Computing breaks the boundary between two separate fields, neuroscience and computer science. It paves the way for machines to have reasoning abilities which is analogous to human. The research field of cognitive computing is interdisciplinary, and uses knowledge and methods from many areas such as psychology, biology, signal processing, physics, information theory, mathematics, and statistics. The development of cognitive computing will keep cross-fertilizing these research areas. However, in multimedia applications there still remain many open problems for cognitive computing. Technologies like cloud computing and big data are essential to upgrade the web systems with near human intelligence by using new capabilities such as machine learning, cognitive sensing, data mining, pattern recognition and natural language processing.

The objective of this special section is to provide a platform for researchers to share their thoughts and findings on various issues involved in artificial intelligence and networks. Authors of papers presented at the EAI International Conference on Robotic Sensor Networks (ROSENET - http://rosenets.org/) were invited to submit their substantially expanded papers. ROSENET conference had received over 30 papers from over 5 countries in the world. After a careful review process the 7 papers presented in this special section were selected based on their originality, significance, technical soundness and clarity of exposition.

Virtual Reality (VR) sickness presents an important challenge in VR environments. The authors of "Virtual reality sickness and challenges behind different technology and content settings" [1] present the results of a study on of the effects of VR technology and VR video content type on VR sickness and on autonomous nervous system of the user. Conventional algorithms for blind image deblurring are often inaccurate at blur kernel estimation, and the recovery effect is far from perfect. To address this, Zhu et al. propose a single-image blind deblurring method based on local rank [2]. When the VMs runs too many tasks, the host will be overloaded and exception occurs. Regarding the issue, Jiang et al. [3] consider the communication cost of virtual machine (VM) migration and proposes a VM Migration Algorithm based on Gene Aggregation Genetic Algorithm (VMM-GAGA). In [4], the authors propose an end-to-end infrared small target detection model (called CDAE) based on denoising autoencoder network and convolutional neural network, which treats small targets as "noise" in infrared images and transforms small target detection tasks into denoising problems. Facing the problem that undergraduates have numerous tasks and limited time, the authors design a mass customization model which will automatically provide every student with a suitable curriculum to maximize their degree of satisfaction when the student enters a set of courses [5]. Road region detection is a hot spot research topic in autonomous driving field. It requires to give consideration to accuracy, efficiency as well as prime cost. In [6], the authors choose millimeter-wave (MMW) Radar to fulfill road detection task, and put forward a novel method based on MMW which meets real-time requirement. Predrag et al. [7] proposed different recurrent neural network (RNN), and collective creativity approaches to support interactions between Artificial Intelligence clones and trigger a humanless creative process which should lead to unsupervised robot creativity.

✉ Yujie Li
    yzyjli@gmail.com

    Huimin Lu
    dr.huimin.lu@ieee.org

[1] Kyushu Institute of Technology, Fukuoka, Japan

[2] Yangzhou University, Yangzhou, China

References

1. Guna J, Geršak G, Humar I et al (2019) Virtual reality sickness and challenges behind different technology and content settings. Mobile Netw Appl. https://doi.org/10.1007/s11036-019-01373-w
2. Zhu L, Jin L, Zhu J et al (2019) Blind image deblurring based on local rank. Mobile Netw Appl. https://doi.org/10.1007/s11036-019-01375-8

3. Jiang Y, Wang J, Shi J et al (2020) Network-aware virtual machine migration based on gene aggregation genetic algorithm. Mobile Netw Appl. https://doi.org/10.1007/s11036-019-01376-7

4. Shi M, Wang H (2019) Infrared dim and small target detection based on denoising autoencoder network. Mobile Netw Appl. https://doi.org/10.1007/s11036-019-01377-6

5. Liu R, Shi Y, Yi B et al (2019) Humanized computing for mass customization application in curriculum management. Mobile Netw Appl. https://doi.org/10.1007/s11036-019-01374-9

6. Xu F, Wang H, Hu B et al (2019) Road boundaries detection based on modified occupancy grid map using millimeter-wave radar. Mobile Netw Appl. https://doi.org/10.1007/s11036-019-01378-5

7. Nikolic PK, Yang H (2019) Artificial intelligence clone generated content toward robot creativity and machine mindfulness. Mobile Netw Appl. https://doi.org/10.1007/s11036-019-01281-z

Publisher's Note Springer Nature remains neutral with regard to jurisdictional claims in published maps and institutional affiliations.