

Guest Editor Preface

Cyberworlds are information worlds or communities created in cyberspace by participants collaborating either intentionally or spontaneously. As information worlds, they accumulate information regardless of whether or not anyone is in. Cyberworlds can be based on sharing text, image, and video information, and they can also be immersive multi-user networked, shared virtual worlds. Cyberworlds have been created and applied in such areas as e-business, e-commerce, e-manufacturing, e-learning, and cultural heritage. They augment and sometimes replace real life and become a significant component of real economy. Examples of such cyberworlds with millions of participants are communities created in different social networking services, virtual shared worlds, and multiplayer online games. Problems of cyberworlds were discussed at the annual 2015 International Conference on CyberWorlds, which was held in Gotland, Sweden, during October 7–9, 2015. The eight full papers presented at the conference were selected to be published in extended form in this special issue of the *Transactions on Computational Science*.

The issue begins with a report on the position statements made by Alexei Sourin, Ray Earnshaw, Marina Gavrilova, and Olga Sourina during the plenary panel on problems of human–computer interactions in cyberworlds.

In the next article, Kyota Aoki and Naoki Aoyagi propose a method for realizing augmented reality that works in a head-worn-type equipment that recognizes objects in camera images.

Mikael Fridenfolk continues by presenting an application developed as a research platform for the real-time generation of 3D L-system structures. It enables the user to interact with the L-system geometries to render a mathematically defined world.

Next, Qian Fu, Zhongke Wu¹, Xiang Ying, Mengdi Wang, Xia Zheng, and Mingquan Zhou present a novel method for solving the problem of an adequate revealing the esthetic value of Chinese calligraphy.

In the next contribution, Christopher J. Headleand, James Jackson, Ben Williams, Lee Priday, William J. Teahan, and Llyr Ap Cenydd explore how the perceived identity of a non-player character affects a player's behavior in computer games.

In the next article, Xiyuan Hou, Yisi Liu, Wei Lun Lim, Zirui Lan, Olga Sourina, Wolfgang Mueller-Wittig, and Lipo Wang describe a novel brain–computer interface integrated with proposed real-time emotion, mental workload, and stress–recognition algorithms.

Andrés Iglesias, Akemi Gálvez, and Marta Collantes address the problem of fitting a given set of data points in the least-square sense by using a polynomial Bézier curve.

Zahra Sayed, Hassan Ugail, Ian Palmer, Jon Purdy, and Carlton Reeve describe a novel approach to generating 3D Islamic geometric patterns using the shape grammar method.

Finally, Nurseda Yildirim and Bahri Uzunoglu present data-mining and optimization methods for detecting power ramps, which are large swings in power generation, within a short time window.

The organizers of the conference are very grateful to Prof. Marina Gavrilova, Editor-in-Chief of the *Transactions on Computational Science*, for her continuing support and assistance. We also wish to thank the authors for their high-quality contributions, as well as the reviewers for their invaluable advice that helped to improve the papers.

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Alexei Sourin

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