

# Foreword and Editorial

## International Journal of ICT-aided Architecture and Civil Engineering (IJACE)

We are very happy to publish this issue of an International Journal of ICT-aided Architecture and Civil Engineering by Global Vision Press.

This issue contains 3 articles. Achieving such a high quality of papers would have been impossible without the huge work that was undertaken by the Editorial Board members and External Reviewers. We take this opportunity to thank them for their great support and cooperation.

The paper entitled “Developing an Autonomous Behavior of Virtual Users Based on Psychological Interpretation of Human Behavior to an Atypical Architectural Shape”, virtual users (VUsers) enable analytical and observable representations in human behavior simulations. By utilizing advanced, intelligent VUsers, architects can discover new inspirations for designs or problems that could be overlooked. This study describes a way to enhance VUsers’ intelligence, focusing on VUsers’ responses to atypical architectural spaces. In our previous research, we investigated users’ behavior in the atypical architecture spaces and the psychological causes of this behavior. In this study, we focus on computerization and systematic integration of our prior results in order to develop technology to automatically set the place where user behavior can be expressed in an atypical architectural design and VUsers can exhibit psychologically appropriate behavior. For this purpose, we investigated how to designate trigger spots, trigger viewpoints, and behavioral areas, which are necessary for the autonomous behavior of VUsers. The results of this research will be integrated into ActoViz, a user behavior simulation system.

In the paper “Design Strategy Model for Sustainable Spacial Planning”, the purpose of this study was to explore the methods and strategies for sustainable materials to be provided to the design industry, along with the responsibility for managing the usable alternative resources as a means to recognize and cope with the seriousness of global environmental problems. Space Re-Design is based on the respect towards humanity and nature and highlights the social responsibility to be fulfilled by the design, taking the 3 pillars of sustainable design, i.e., social value, environmental value, and economic value into consideration. Space Re-Design refers to the design that is completed by reprocessing and rearranging the already used or discarded materials, not new materials such as all articles and finishing materials, necessary to re-plan the design in such a way that suits new purpose, although most portion of original space is preserved. In other words, Space Re-Design requires the methods and strategies promoting the circulatory use of materials from the aspect of comprehensive and systematic supply of materials which are recycled only through primary processing such as hitting, cutting, and folding, instead of applying heat to make new goods or products. For that, this study is meaningful in that it explored the circulatory model of materials necessary to plan and create the new sustainable space based on consideration of design history related to the tangible/intangible value of sustainable design and difference and repetition.

The paper entitled “3D Laser Scanner for Tunnel Surveying and Accuracy Analysis According to Registration Method”, the tunnel is an important facility in the United States

and Canada and is recognized as an infrastructure for eco-friendly urban construction among the structures that make up smart cities. Total Station Measurements and Global Navigation Satellite Systems (GNSS) have the disadvantage of long working time and impossible satellite reception for tunnel measurements. Recently, 3D laser scanners have been used in a variety of areas as a new way to improve existing surveying methods. In this study, 3D laser scanners were used for tunnel measurements to assess its usefulness. Scan data was obtained by configuring traverse using the Total Station function and compared with check points at 10 points already installed for accuracy verification. Results of accuracy evaluation compared with check points, the maximum error was within 6cm in the N, E, and H directions, indicating the plane and elevation acceptable accuracy of scale 1:1000 digital maps, and suggesting the applicability of methods using reference point performance and laser scan data. Scanning data enables continuous analysis of scan section shapes as well as cross sectional analysis. Further research can improve the accuracy of the feature registration method, which can improve the tunnel survey efficiency.

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**Editors of the November Issue on  
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