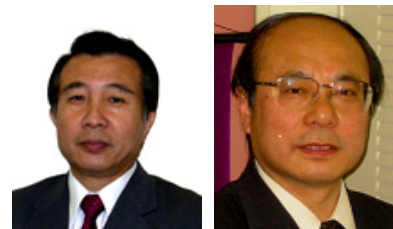


## Seeing, Visualizing, Examining, and Watching the Invisible: Inspirations that Advance Science



Aoki, K.

Ota, M.

It is our great pleasure to publish the 2<sup>th</sup> issue of the 12<sup>th</sup> volume of the Journal of Visualization for leaders in our field across the world. Our journal covers fields, from scientific art to interdisciplinary imaging science, that enable invisible objects to be seen through visualization technology by using experiments and computers. We believe that the inspiration of “seeing, visualizing, examining, and watching” invisible objects will further promote science and contribute to mankind. Visualization technology used for visualization of cerebrovascular blood flow or cancer treatment in particular has garnered attention in the field of medicine in recent years. In the diagnosis of cancer, optical imaging using optical technology has enabled the visualization of cancer cells, and this technology has been shown to be useful for basic research and diagnosis. In addition, diagnostic methods in which visualization is used to determine the patients’ individual characteristics at the molecular level have been developed, and this is expected to lead to even safer and more effective treatments. Therefore, visualization technology is continuously advancing.

In his special lecture to commemorate the 10<sup>th</sup> anniversary of the JOV, Dr. Toshio Kobayashi (President and Executive Director of the Japan Automobile Research Institute (JARI)) predicted that visualization of the following may become reality in the future: 1) hearing, 2) smell, 3) taste, 4) touch, and 5) brain and mind. Therefore, visualization technology is diversifying, expanding in the scope of research, and constantly contributing to the advancement of science and technology. In the present issue of Journal of Visualization, we are happy to present some recent developments of experimental, computer aided techniques and science art. This issue contains ten regular papers, two short papers. The first seven papers report on fine pieces of research work on flow visualization, including numerical flow visualization of the formation of Taylor cells, double orifice in a square pipe, arteriovenous fistula and aneurysm using computational fluid dynamic, bronchiole model with semicircular stenosis, on the respiratory airflow in human airway by PIV, airflow characteristics in a car with PIV and segmentation of CT brain images using unsupervised clusterings. The rest of five papers present unique applications of visualization techniques to propagation of orifice- and nozzle-generated vortex rings in air, an ejector system, a propeller slipstream with background oriented schlieren, and patterns of ink in water and air, story visualization of literary works - How a computer reads Shakespeare’s plays. All of these articles contribute to the new development of visualization in engineering and scientific field in the world.

Finally, we would like to extend our appreciation to all the authors and also the editorial secretary, without their valuable efforts this issue would have not appeared.

*Managing Editors*  
Aoki, K. and Ota, M.

**Cover Photo**

**Laboratory-scale blast wave phenomena - optical diagnostics and applications**

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Adapted from: Shock Waves, 14- 5/6 (2005) 343-357.

This figure shows simultaneous visualization of color schlieren method and double exposure infinite fringe holographic interferometry of spherical shock wave generated by exploding a 10 mg silver azide pellet with pulse laser beam irradiation on it. The color tune represents density gradient and the fringe pattern represents density distribution. A pronounced jet of combustion products is generated in the direction of laser irradiation.