

# External Awards

## IPSI Interaction 2010 Best Paper Award

**Winners:** Akihiro Miyata, Hisako Shiohara, and Ko Fujimura, NTT Cyber Solutions Laboratories

**Date:** March 1, 2010

**Organization:** The Information Processing Society of Japan

For “Two-dimensional Letter Block Indexing Method to Enhance a Book without Markers” (in Japanese).

**Published as:** A. Miyata, H. Shiohara, and K. Fujimura, “Two-dimensional Letter Block Indexing Method to Enhance a Book without Markers,” Proc. Interaction 2010, IPSJ, Tokyo, Japan, Mar. 2010 (in Japanese).

## The Telecom System Technology Award

**Winners:** Tatsuya Mori<sup>†1</sup>, Tetsuya Takine<sup>†2</sup>, Jianping Pan<sup>†3</sup>, Ryoichi Kawahara<sup>†1</sup>, Masato Uchida<sup>†4</sup>, and Shigeki Goto<sup>†5</sup>

<sup>†1</sup> NTT Service Integration Laboratories

<sup>†2</sup> Osaka University

<sup>†3</sup> University of Victoria

<sup>†4</sup> Kyushu Institute of Technology

<sup>†5</sup> Waseda University

**Date:** March 15, 2010

**Organization:** The Telecommunications Advancement Foundation

For “Identifying Heavy-Hitter Flows from Sampled Flow Statistics”.

The paper develops a new framework for identifying heavy-hitter flows in sampled packets. The framework is very flexible in making appropriate trade-offs between false errors with regard to a given sampling frequency. We validate our approach by using traffic traces. Our framework allows a very cost-effective implementation to be deployed in large-scale high-speed networks.

**Published as:** T. Mori, T. Takine, J. Pan, R. Kawahara, M. Uchida, and S. Goto, “Identifying Heavy-Hitter Flows from Sampled Flow Statistics,” IEICE Trans. Commun., Vol. E90-B, No. 11, pp. 3061–3072, Nov. 2007.

# Papers Published in Technical Journals and Conferences

## Localized Corrosion of Lead Plate Immersed in Water Containing High Concentration of Chloride Ions

E. Yoneta, M. Watanabe, S. Yanagi, M. Matsumoto, M. Kama, H. Saito, and T. Handa

Proc. 15th Asian-Pacific Corrosion Control Conference, Philippine Corrosion Society, Inc., Vol. 1, No. 1, p. 132, Oct. 18–21, Makati City, Philippines, 2009.

An immersion experiment using an artificial crevice sample to reproduce the corrosion observed in crevices of lead enclosures showed that the corrosion depth increased with immersion time. Anodic polarization curve measurements showed that the pitting potentials of the lead plate shifted to the less noble side as the chloride ion concentration was increased.

## Crevice Corrosion Test Method and Corrosion Analysis of Zn-coated Steel

H. Saito and T. Handa

Proc. 4th International Symposium on Advanced Fluid/Solid Science and Technology in Experimental Mechanics, The Japanese Society for Experimental Mechanics, Vol. 1, No. 1, Nov. 28–30, Niigata, Japan, 2009.

We designed a test method for measuring the crevice corrosion rate

in wetting conditions and evaluated Zn-, Zn-Al-, and Al-coated steel plates.

## Hydrogen Delayed Fracture Phenomenon of Steel

H. Saito

Proc. 11th ISSP International Symposium, The Institute for Solid State Physics, Vol. 1, No. 1, Oct. 12–16, Chiba, Japan, 2009.

Some kinds of steel in concrete cause a hydrogen delayed fracture. We report this phenomenon and countermeasures based on a screening method.

## Implicit Visuomotor Processing for Quick Online Reactions Is Robust against Aging

K. Kadota and H. Gomi

The Journal of Neuroscience, Society for Neuroscience, Vol. 30, No. 1, pp. 205–209, 2010.

It is well established that humans can react more quickly to a visual stimulus in the visual field center than to one in the visual periphery and that the reaction to a stimulus in the visual periphery deteriorates markedly with aging. These tendencies are true for con-

ventional discrimination-reaction tasks. Surprisingly, however, we found that they are entirely different when reactions are induced by the same visual stimuli during reaching movements. The reaction time for a stimulus in the visual periphery was significantly faster than in the central vision, and age-related slowing of reactions to the stimulus in the visual periphery was quite small compared with that observed in the conventional reaction tasks. This inconsistent slowing of reactions under different motor conditions underscores a distinctive visuomotor pathway for online control, which is more robust against age-related deterioration.

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#### **Fundamental Oscillation of up to 915 GHz in Small-area InGaAs/AIAs Resonant Tunneling Diodes with Planar Slot Antennas**

M. Shiraishi, S. Suzuki, A. Teranishi, M. Asada, H. Sugiyama, and H. Yokoyama

Jpn. J. Appl. Phys., JSAP, Vol. 49, No. 2, p. 020211, 2010.

A fundamental oscillation of up to 915 GHz was observed at room temperature in small-area InGaAs/AIAs resonant tunneling diodes (RTDs) with planar slot antennas. The dependence of the oscillation frequency on the RTD mesa area was also determined. Although the output power was small (a few tens of nanowatts) in this study owing to the relatively low available current density (difference in current density between peak and valley:  $\sim 3 \text{ mA}/\mu\text{m}^2$ ) and small mesa area ( $\sim 0.63 \mu\text{m}^2$ ), it should be possible to increase the output power by using a high available current density.

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#### **A Proposal of Dynamic Multi-homing Group Service with Personal Context Information**

S. Tanimoto, Y. Seki, Y. Kimura, and Y. Kinouchi

Information Processing Society of Japan, Vol. 51, No. 2, pp. 575–589, 2010 (in Japanese).

The diversification of the network service has been proceeding, with the result that it may be seen in the development of cloud computing and the Next Generation Network, the diffusion of wide-area Ethernet and wireless local area network services, and so on. That is, the ubiquitous environment where a network can always be easily used anywhere is becoming common. In terms of the working style

of individuals, business in the ubiquitous environment has also been becoming possible in the same way. On the other hand, if we consider the future aging society with fewer children and diversified lifestyles, not only work relationships but also relationships in society and local neighborhoods are also becoming important. In this paper, we propose a service that uses an information system to support an individual's activities as a service utilizing cooperation between the network and the information system. That is, a person's work and social activities are treated as group activities on an information system. We propose a dynamic multi-homing group service that specifically supports an individual's activities according to the time, place, and occasion conditions, which are the context information and define the service requirements and architecture. In this service, a contention control function between groups for automatically managing the relationship between an individual and two or more organizations is a key technology, and for this purpose, we propose a new hybrid control system. The effectiveness of the proposed service was clarified using a prototype.

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#### **Adaptive Power Saving Mechanism for 10 Gigabit Class PON Systems**

R. Kubo, J. Kani, Y. Fujimoto, N. Yoshimoto, and K. Kumozaki

IEICE, Vol. E93-B, No. 2, pp. 280–288, 2010.

This paper proposes a power saving mechanism with a variable sleep period to reduce the power consumed by optical network units (ONUs) in passive optical network (PON) systems. In PON systems based on time division multiplexing, sleep and periodic wake-up (SPW) control is an effective ONU power saving technique. However, its effectiveness is fully achieved only if the sleep period changes in accordance with the traffic conditions. This paper proposes an SPW control mechanism with a variable sleep period set according to traffic conditions, which greatly improves the power saving effect. In addition, it describes the protocols needed between an optical line terminal and ONUs when the proposed mechanism is applied to 10-Gbit/s-class PON systems, i.e., IEEE 802.3av 10G-EPON and FSAN/ITU-T 10G-PON systems. The validity of the proposed mechanism was confirmed by numerical simulations.