

External Awards

DICOMO 2008 Excellent Presentation Awards

Winner: Hiroshi Watanabe, NTT Cyber Solutions Laboratories

Date: July 11, 2008

Organization: IPSJ Multimedia, Distributed, Cooperative and Mobile Symposium (DICOMO)

For “An Experiment on User Generated ID Method in Compass-Mark as an Information Guide System with Floor Signs” (in Japanese).

User generated ID (UGID) is an information design method for tying digital content to the real world simply. We enhanced Compass-Mark as an information guide system with floor signs and built in the UGID function. This paper clarifies the effectiveness of the UGID method through an experiment in Akihabara with the enhanced CompassMark system.

The 9th International Conference on Web Information Systems Engineering (WISE 2008) Kambayashi Best Paper Award

Winner: Masaya Murata, Hiroyuki Toda, Yumiko Matsuura, and

Ryoji Kataoka, NTT Cyber Solutions Laboratories

Date: September 2, 2008

Organization: The WISE Program Committee

For “Improving Mobile Web-IR Using Access Concentration Sites in Search Results.”

This paper proposes a method of improving mobile Web-IR (information retrieval) by using click logs of a search service site. This method first identifies the access-concentrated sites among many search results based on the click logs. Then, query expansion with terms extracted from those access-concentrated sites is performed.

The 14th Sakaki Incentive Award

Winner: Hiroki Hibino, NTT Basic Research Laboratories

Date: September 16, 2008

Organization: The 141th Committee on Microbeam Analysis of Japan Society for the Promotion of Science

For “Dynamical Observation of Crystal Growth and Surface Phase Transition by Low-energy Electron Microscopy” (in Japanese).

Papers Published in Technical Journals and Conferences

Single-Electron-Resolution Electrometer Based on Field-Effect Transistor

K. Nishiguchi, C. Koechlin, Y. Ono, A. Fujiwara, H. Inokawa, and H. Yamaguchi

IEICE Technical Report, ED2008-62, SDM2008-81, pp. 119–124, 2008.

An electrometer based on field-effect transistors was fabricated on a silicon-on-insulator substrate. The electrometer has a nanometer-scale channel and a capacitively coupled node, where single electrons are stored. We discuss the dependence of the charge sensitivity of the electrometer on its structure and on its operating conditions and give guidelines for achieving higher charge sensitivity. The device optimization based on this dependence allows the room-temperature demonstration of the electrometer with extremely high charge sensitivity of $0.0013 e/\sqrt{\text{Hz}}$ at 1 Hz.

High-pressure and high-temperature annealing of diamond ion-implanted with various elements

K. Ueda and M. Kasu

Diamond and Related Materials, Elsevier, Vol. 17, No. 7-10, pp. 1269–1272, 2008.

We tried to dope various ions (B, Al, Ga, Mg, and Be) into diamond films by combining ion-implantation with high-pressure and high-temperature annealing. In cathodoluminescence spectra of Be-implanted films, previously unreported emissions appeared at 4.843,

4.687, and 4.533 eV. These emissions were only observed from Be-implanted films, and they were not observed from B-, Al-, Ga-, and Mg-implanted ones. The 4.843-eV line is assigned to the zero phonon line, and the 4.687- and 4.533-eV lines are its phonon replicas because the energy difference between peaks is close to the optical phonon energy of diamond (~ 0.15 eV). The temperature dependence of the 4.843-eV line is similar to that of bound excitons.

Novel signed chromatic dispersion monitoring technique based on asymmetric waveform distortion in DQPSK receiver

H. Kawakami, E. Yoshida, H. Kubota, and Y. Miyamoto
OECC 2008 Conference, Sydney, Australia.

We propose a novel monitoring technique targeting chromatic dispersion (CD) in a DQPSK system. A signed non-intrusive monitor can be realized by using asymmetric waveform distortion in a 43-Gbit/s DQPSK system without pilot tones.

Effect of Ca²⁺ on Vesicle Fusion on Solid Surface: An *In Vitro* Model of Protein-Accelerated Vesicle Fusion

Y. Shinozaki, A. M. Siitonen, K. Sumitomo, K. Furukawa, and K. Torimitsu

Jpn. J. Appl. Phys., Vol. 47, No. 7, pp. 6164–6167, 2008.

Lipid vesicle fusion is an important reaction in the cell. Calcium ions (Ca^{2+}) participate in various important biological events including the fusion of vesicles with cell membranes in cells. We studied the effect of Ca^{2+} on the fusion of egg yolk phosphatidylcholine/brain phosphatidylserine (eggPC/brainPS) lipid vesicles on a mica substrate by fast scanning atomic force microscopy (AFM). When unattached and unfused lipid vesicles on mica were rinsed away, discrete patches of fused vesicles were observed under high Ca^{2+} concentrations. At 0 mM Ca^{2+} , lipid vesicles were fused on mica and formed continuous supported lipid bilayers (SLBs) covering almost the entire mica surface. The effect of Ca^{2+} on SLB formation was offset by a Ca^{2+} chelating agent. When lipid vesicles were added during AFM observation, vesicles fused on mica and covered almost all areas even under high Ca^{2+} concentrations. These results indicate that force between the AFM tip and vesicles overcomes the Ca^{2+} -reduced fusion of lipid vesicles.

An Efficient Anonymous Credential System

N. Akagi, Y. Manabe, and T. Okamoto

Financial Cryptography and Data Security, International Financial Cryptography Association, Vol. 5143, No. 1, pp. 272–286, Cozumel, Mexico, 2008.

This paper presents an efficient anonymous credential system that includes two variants. One is a system that lacks a credential revoking protocol, but provides perfect anonymity-unlinkability and computational unforgeability under the strong Diffie-Hellman assumption. It is more efficient than existing credential systems with no revocation. The other is a system that provides revocation as well as computational anonymity-unlinkability and unforgeability under the strong Diffie-Hellman and decision linear Diffie-Hellman assumptions. This system provides two types of revocation simultaneously: one blacklists a user who acted wrongly so that he can no longer use his credential, and the other identifies a user who acted wrongly from his usage of credential. Both systems are provably secure under the above-mentioned assumptions in the standard model.
