

External Awards

IPSJ Yamashita SIG Research Award

Winner: Akihiro Miyata, NTT Cyber Solutions Laboratories

Date: July 25, 2007

Organization: Information Processing Society of Japan (IPSJ)

For “Response of a Blog Post: An Analysis of Interactions between Writer and Readers” (in Japanese).

We present a method of evaluating blog entries that takes into account the response from readers. Here, response is composed of width, strength, speed, and length. These indicators enable users to find entries in which many readers are interested, in which a small group has an enthusiastic interest, in which a few members are chat-

ting at intervals of a few seconds, and in which many readers have shown interest over a long period.

References:

- 1 A. Miyata, H. Matsuoka, S. Okano, S. Ishiuchi, N. Arakawa, and Y. Kato, “Response of a Blog Post: An Analysis of Interactions between Writer and Readers,” IPSJ Groupware and Network Services Workshop 2006 (in Japanese).
- 2 A. Miyata, H. Matsuoka, S. Okano, S. Ishiuchi, N. Arakawa, and Y. Kato, “Response to a Blog Entry,” Third International Conference on Collaboration Technologies 2007, Seoul, July 2007.

Papers Published in Technical Journals and Conferences

Statistical Machine Translation Based on Syntactic Transfer with Phrases

K. Imamura, H. Okuma, and E. Sumita
IPSJ, Vol. 48, No. 4, pp. 1809–1819, 2007.

This paper presents a practical approach to statistical machine translation (SMT) based on syntactic transfer. Conventionally, phrase-based SMT generates an output sentence by combining phrase (multi-word sequence) translation and phrase reordering without syntax. On the other hand, SMT based on tree-to-tree mapping, which involves syntactic information, is theoretical, so its features remain unclear from the point of a practical system. The SMT proposed in this paper translates phrases with hierarchical reordering based on the bilingual parse tree. In our experiments, the best translation was obtained when both phrases and syntactic information were used for the translation process.

The Effect of a Flashing Visual Stimulus on the Auditory Continuity Illusion

M. Kobayashi, Y. Osada, and M. Kashino
Perception and Psychophysics, Psychonomic Society, Vol. 69, No. 3, pp. 393–399, 2007.

The effect of a visual stimulus on the auditory continuity illusion was examined. Observers judged whether a tone that was repeatedly alternated with a band-pass noise was continuous or discontinuous. For most observers, a transient visual stimulus that was synchronized with the onset of the noise increased the limit of illusory continuity in terms of maximum noise duration and maximum tone level. The smaller the asynchrony between the noise onset and the visual stimulus onset, the larger the visual effect on this illusion. On the other hand, detection of a tone added to the noise was not enhanced by the visual stimulus. These results cannot be fully explained by the conventional theory that illusory continuity is created by the decomposition of peripheral excitation produced by the occluding sound.

Neural Mechanisms of Auditory Awareness Underlying Verbal Transformations

H. M. Kondo and M. Kashino
NeuroImage, Elsevier, Vol. 36, No. 1, pp. 123–130, 2007.

Prolonged listening to a repeated word without a pause produces a series of illusory transitions of the physically unchanging word, which is called verbal transformation. Verbal transformations provide a rare opportunity to examine how auditory percepts are formed in the brain. We found that verbal forms are affected by phonetic reorganization of a word, rather than by auditory adaptation and lexical distortion of it. We identified brain activity leading to individual differences between perceptual transitions and tone detection. An event-related fMRI analysis revealed that the left inferior frontal cortex (IFC), anterior cingulate cortex (ACC), and the left prefrontal cortex were activated when perceptual transitions from one verbal form to another occurred, but not when tone pips were detected. The number of perceptual transitions showed positive and negative correlations with signal intensity in the left IFC and the left ACC, respectively. The results suggest that active generation of verbal forms is linked with articulatory gestures for speech production and that the frequency of perceptual transitions is determined by a balance of the activations between the two brain regions. Structural equation modeling demonstrated that individual differences in the number of perceptual transitions rely on negative feedback from the ACC to the IFC via the posterior insula. These findings suggest that distributed frontal areas are involved in auditory awareness underlying verbal transformations.

Japanese Dependency Parsing Using Sequential Labeling for Semi-spoken Language

K. Imamura, G. Kikui, and N. Yasuda
Proc. of ACL 2007, pp. 225–228, Prague, 2007.

The amount of documents directly published by end users is increasing along with the growth of Web 2.0. Such documents often contain spoken-style expressions, which are difficult to analyze using

conventional parsers. This paper presents dependency parsing whose goal is to analyze Japanese semi-spoken expressions. One characteristic of our method is that it can parse self-dependent (independent) segments using sequential labeling.

Detecting Semantic Relations between Named Entities in Text Using Contextual Features

T. Hirano, Y. Matsuo, and G. Kikui

Proc. of ACL 2007, pp. 157–160, Prague, 2007.

This paper proposes a supervised learning method for detecting a semantic relation between a given pair of named entities, which may be located in different sentences. The method employs newly introduced contextual features based on centering theory as well as conventional syntactic and word-based features. These features are organized as a tree structure and are fed into a boosting-based classification algorithm. Experimental results show the proposed method outperformed prior methods and increased precision and recall by 4.4% and 6.7%.

Using a Volterra System Model to Analyze Nonlinear Response in Video-packet Transmission over IP Networks

M. Masugi and T. Takuma

Commun. in Nonlinear Science & Numerical Simulation, Elsevier, Vol. 12, No. 3, pp. 441–421, 2007

This paper presents a Volterra system-based nonlinear analysis of video-packet transmission over IP networks. With the Volterra system, which is applicable to the modeling of nonlinear dynamic systems from sets of input and output data, we applied a time-series analysis of measured data for network response evaluation. In a test-bed connected to the Internet, we measured two parameters: the time intervals between consecutive packets from a video server at the originating side, and the transmission time of packets between origi-

nating and terminating sides. We used these as input and output data for the Volterra system and confirmed that the relative error of this model changed with conditions of network systems, which suggested that the packet transmission process affected the degree of nonlinearity of the system. The proposed method can reproduce the time-series responses observed in video-packet transmission over the Internet, reflecting nonlinear dynamic behaviors such that the obtained results provided us with an effective depiction of network conditions at different times.

(d+1,2)-Track Layout of Bipartite Graph Subdivisions

M. Miyauchi

Proc. of Computational Geometry and Graph Theory, Tokai Univ., pp. 132–133, Kyoto, 2007.

This paper deals with track layouts of bipartite graph subdivisions and shows the following theorem: For every integer $d > 2$, every bipartite graph $G_{m,n}$ has a $(d+1,2)$ -track subdivision with $2\log_d n-1$ division vertices per edge, where $m \geq n$.

Optically Injection-locked Self-oscillating HBT MMIC Optoelectronic Mixer for Bi-directional Fiber-fed Wireless Links

J. Y. Kim, W. Y. Choi, H. Kamitsuna, M. Ida, and K. Kurishima

Proc. of IEEE MTT-S 2007, Vol. 1, No. 1, pp. 237–240, Honolulu, 2007.

A 30-GHz bi-directional fiber-fed wireless link is realized using an optically injection-locked self-oscillating HBT optoelectronic mixer as a harmonic frequency up- and down-converter. Bi-directional transmissions of 32 QAM data are successfully demonstrated.