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Image Processing Laboratory



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Refereed Journal Papers

[yaguchi-01:2014] Yuki Niitsuma and Syunpei Torii and Yuichi Yaguchi and Ryuichi Oka. Time-segmentation- And position-free recognition from video of air-drawn gestures and characters. *Multimedia Tools and Applications*, pages 1–25, May 2015.

We report the recognition in video streams of isolated alphabetic characters and connected cursive textual characters, such as alphabetic, hiragana and kanji characters, that are drawn in the air. This topic involves a number of difficult problems in computer vision, such as the segmentation and recognition of complex motion on videos. We use an algorithm called time-space continuous dynamic programming (TSCDP), which can realize both time- and location-free (spotting) recognition. Spotting means that the prior segmentation of input video is not required. Each reference (model) character is represented by a single stroke that is composed of pixels. We conducted two experiments involving the recognition of 26 isolated alphabetic characters and 23 Japanese hiragana and kanji air-drawn characters. We also conducted gesture recognition experiments based on TSCDP, which showed that TSCDP was free from many of the restrictions imposed by conventional methods.

[yaguchi-02:2014] Incheon Paik, Wuhui Chen, Banage TGS Kumara, Takazumi Tanaka, Zhenni Li, and Yuichi Yaguchi. Linked Data-Based Service Publication for Service Clustering. *Advances in Computer Science and its Applications*, pages 1429–1435, January 2014.

In this paper, we propose an approach to publish services based on Linked data principles and discover services by service cluster with visualization for reducing the using thresholds. First, we propose Linked social service which is published on the open web by following Linked data principles with social link, then, a spatial clustering algorithm is proposed to enable visualization for reducing the using thresholds. Finally, experiment is conducted to show the effectiveness of our proposed approach.

Refereed Proceeding Papers

[yaguchi-03:2014] N. Terunuma, Y. Yaguchi, Y. Watanobe, and R. Oka. Visualization of spread of topic words on Twitter using stream graphs and relational graphs. In *2014 Joint 7th International Conference on*

Summary of Achievement

and Advanced Intelligent Systems (ISIS), 15th International Symposium on, pages 761–764. *Soft Computing and Intelligent Systems (SCIS)*, 2014,?

In this paper, we examine occurrences, cooccurrences, and characteristics for influence and meaning of words by visualizing large amounts of data from Twitter. We classified words using morphological analysis of tweets and developed a stream graph by finding the frequency of each word. We analyzed the co-occurrence of words using quantification methods of the fourth type to find relationships and showed distances between words in a similarity graph. We present examples of the relationships found by our analysis.

[yaguchi-04:2014] Yuki Nitsuma and?Syunpei Torii and?Yuichi Yaguchi and?Ryuichi Oka. Time-segmentation- and Position-free Recognition from Video of Air-drawn Gestures and Characters. In *ICPRAM?2014*, pages 588–599, 2014.

We report on the recognition from video streams of isolated alphabetic characters and connected cursive textual characters, such as alphabetic, hiragana a kanji characters, drawn in the air. This topic involves a number of difficult problems in computer vision, such as the segmentation and recognition of complex motion from video. We utilize an algorithm called time-space continuous dynamic programming (TSCDP) that can realize both time- and location-free (spotting) recognition. Spotting means that prior segmentation of input video is not required. Each of the reference (model) characters used is represented by a single stroke composed of pixels. We conducted two experiments involving the recognition of 26 isolated alphabetic characters and 23 Japanese hiragana and kanji air-drawn characters. Moreover we conducted gesture recognition experiments based on TSCDP and showed that TSCDP was free from many restrictions imposed upon conventional methods.

[yaguchi-05:2014] Banage T. G. S. Kumara and Incheon Paik and?Hiroki Ohashi and?Yuichi Yaguchi and?Wuhui Chen. Context-Aware Filtering and Visualization of Web Service Clusters. In *ICWS?2014*, pages 89–96, 2014.

Web service filtering is an efficient approach to address some big challenges in service computing, such as discovery, clustering and recommendation. The key operation of the filtering process is measuring the similarity of

services. Several methods are used in current similarity calculation approaches such as string-based, corpus-based, knowledge-based and hybrid methods. These approaches do not consider domain-specific contexts in measuring similarity because they have failed to capture the semantic similarity of Web services in a given domain and this has affected their filtering performance. In this paper, we propose a context-aware similarity method that uses a support vector machine and a domain dataset from a context-specific search engine query. Our filtering approach uses a spherical associated keyword space algorithm that projects filtering results from a three-dimensional sphere to a two-dimensional (2D) spherical surface for 2D visualization. Experimental results show that our filtering approach works efficiently.

Unrefereed Papers

- [yaguchi-06:2014] Shusuke Moriya, Yuichi Yaguchi, and Ian Wilson. Normalization and matching routine for comparing first and second language tongue trajectories. In 平成 26 年度 第 3 回情報処理学会東北支部研究会, January 2014.
- [yaguchi-07:2014] Taku Odajima, Yuichi Yaguchi, Kyoko Okudaira, and Hirohide Demura. Development to multi-resolution microscope image viewer for JAXA Tanpopo-Project. In 平成 26 年度 第 3 回情報処理学会東北支部研究会, January 2014.
- [yaguchi-08:2014] Yuta Hiroto and Yuichi Yaguchi. Coarse to Fine Strategy of Full Pixel Image Matching for High Resolution Images. In 平成 26 年度 第 3 回情報処理学会東北支部研究会, January 2014.

Ph.D and Others Theses

- [yaguchi-09:2014] Masaki Satake. Master Thesis: Coarse to Fine Strategy of Full Pixel Image Matching for High Resolution Images, University of Aizu, 2014.
- [yaguchi-10:2014] Keisuke Moriuchi. Graduation Thesis: A Large Area 3D Surface Reconstruction for Aerial Image Sequence, University of Aizu, 2014.

Summary of Achievement

- [yaguchi-11:2014] Yuki Niitsuma. Master Thesis: Time-segmentation- and position-free recognition from video of air-drawn gestures and characters, University of Aizu, 2014.
- [yaguchi-12:2014] Naoki Terunuma. Graduation Thesis: Information Flow Clustering via Similarity of a Propagation Tree, University of Aizu, 2014.
- [yaguchi-13:2014] Masamichi Habu. Graduation Thesis: A 3D Drawing Interface using Multiple Cameras, University of Aizu, 2014.
- [yaguchi-14:2014] Shohei Inagaki. Graduation Thesis: Visualize Personal Position for diffusion information in SNS, University of Aizu, 2014.
- [yaguchi-15:2014] Shusuke Moriya. Graduation Thesis: Normalization and Matching Routine for Comparing First and Second Language Tongue Trajectories, University of Aizu, 2014.
- [yaguchi-16:2014] Masataka Kubota. Master Thesis: Motion Recognition Using Correlation Between Two-Dimensional Maps of Trajectories, University of Aizu, 2014.
- [yaguchi-17:2014] Keigo Anma. Master Thesis: Visualization for temporal variation of topics and multiple words relationship, University of Aizu, 2014.
- [yaguchi-18:2014] Shunsuke Wada. Master Thesis: Event Extraction from Temporal Associated Keyword Map of Micro-blogging Services, University of Aizu, 2014.
- [yaguchi-19:2014] Yuta Hiroto. Graduation Thesis: Coarse to Fine Strategy of Full Pixel Image Matching for High Resolution Images, University of Aizu, 2014.