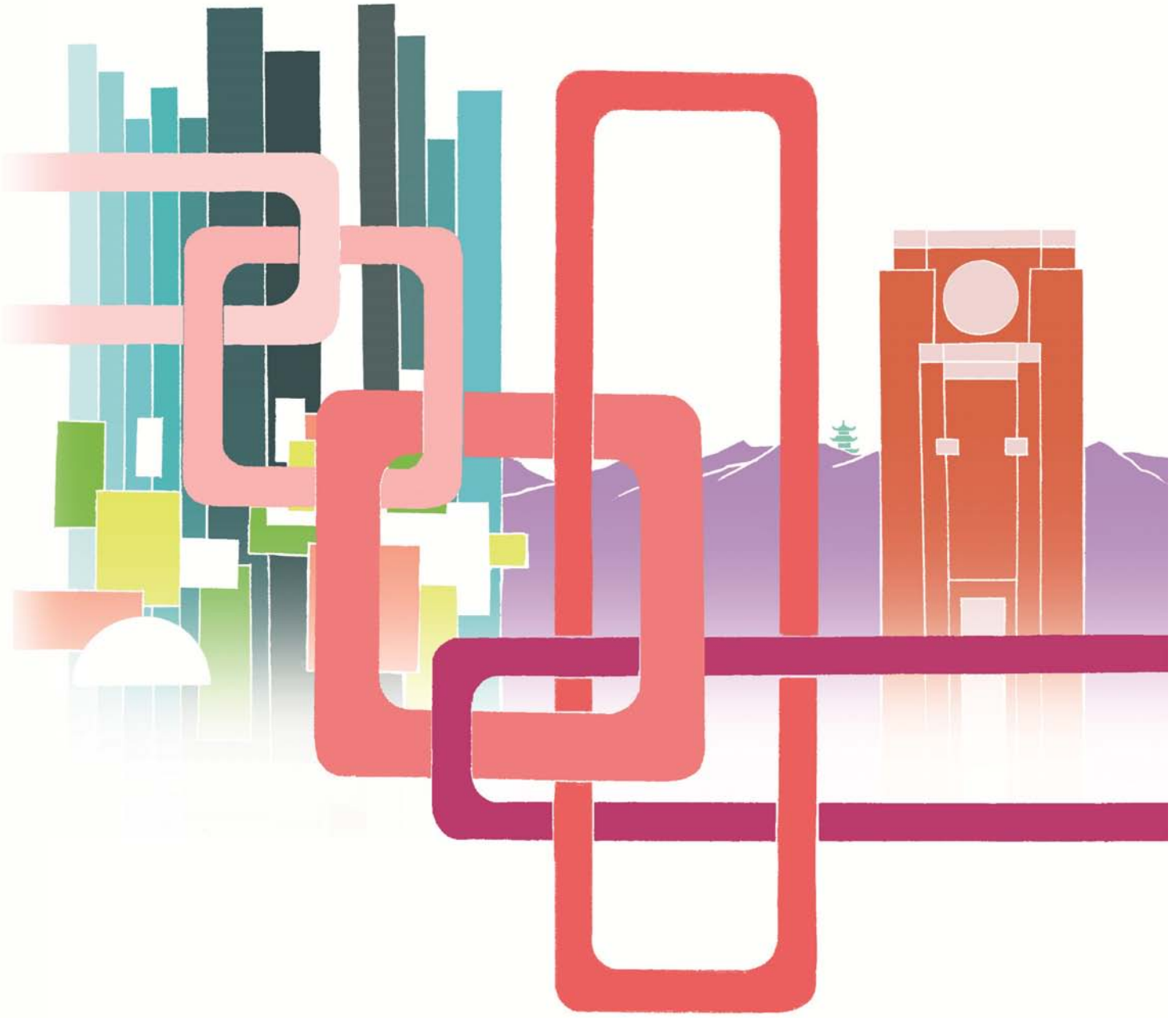
香港浸會大學
HONG KONG BAPTIST UNIVERSITY

京都大学
KYOTO UNIVERSITY

Kyoto University Design Symposium Series

The First Inter-University Symposium on Field Based Design

Guest University: Hong Kong Baptist University



March 29 and 30, 2013

The Clock Tower Centennial Hall, Kyoto University

Oideyasu!

Welcome to Kyoto University for the First Inter-University Symposium on Field Based Design!

This symposium aims to establish an academic community on design methodologies applicable to various fields. To this end, we collaborate with design-oriented activities in different universities to exchange education and research experience. Each time, we jointly organize a symposium with one university mainly located in Asia. This time, we invite a team headed by Professor Jiming Liu of Hong Kong Baptist University, where excellent works in modeling and simulation are ongoing.

We are very pleased to welcome our guests from Hong Kong and excited to hold an occasion to exchange ideas, again. We look forward to a successful and intellectually fruitful symposium.

歡迎來到京都!

歡迎來到京都大學參加第一屆發現式設計（Field Based Design）的校際研討會。

本屆研討會致力於構建一個可用於各種場景的設計方法學的學術社區。為此、我們正與多所大學在面向設計領域合作、交流教育及研究經驗。每屆研討會、我們都將與一所大學（基本位於亞洲）共同組織。此次，我們有幸邀請到香港浸會大學的 劉 際明教授帶領的團隊、他們在建模和模擬方面已經並且持續取得出色的成果。

我們熱烈歡迎來自香港的朋友、並且再次為這次思想交流的機會而激動。期待一個成功的、並且智慧結晶迸發的交流會。

おいでやす！

京都大学での第 1 回フィールドベースドデザイン大学間連携シンポジウムにようこそ！

本シンポジウムは，多様な分野に適用可能なデザイン手法に関する学術コミュニティの設立を目指し実施するイベントです．この目的に向け，教育および研究の経験を共有するために，異なる大学でのデザイン指向の活動と協力しており，主にアジアに本拠地を持つ大学との連携によるシンポジウムを開催いたします．今回は，モデリングとシミュレーションにおける極めて素晴らしい研究を推進している香港浸会大学の劉際明（リウ・ジミン）教授をはじめとするチームを招待致しました．

香港からのゲストをお招きすることは大変光栄であるとともに，再び意見を交換する機会が得られたことを喜ばしく思っております．本シンポジウムが成功をおさめ，また実り多いものになることを期待しております．

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Introduction of Hong Kong Baptist University

Established in 1956, Hong Kong Baptist University has over 50 years of experience in providing broad-based and creativity-inspiring education.

HKBU is consistently at the cutting-edge of the sciences and highly reputed for its commitment to the humanities and arts. The University also encourages service to society among its staff and students, making it a beloved part of the Hong Kong community.

At HKBU, education is far more than simply equipping students with professional knowledge and skills. The University is committed to providing Whole Person Education that inculcates intellectual, cultural, social and sporting skills outside the classroom in addition to training the minds within. We are not just grooming the workforce of tomorrow, we are shaping future leaders.

The University offers world-class, innovative undergraduate, taught postgraduate and research postgraduate programmes leading to Masters or PhD degrees as well as associate degree programmes, all tailored to prepare our students for the challenges of a globalized knowledge-based economy.

Introduction of Kyoto University

Founded in June 1897, Kyoto University has a long history and enduring traditions. The main campus is located in the historic city of Kyoto, a center of traditional Japanese culture.

Since its founding, the University has been dedicated to furthering higher education and fostering an atmosphere of free academic exchange. Graduates of the University play important roles in both national and international affairs, as key players in politics, industry, and society.

At present, Kyoto University is comprised of 10 faculties, 17 graduate schools, 14 research institutes, 21 educational institutes and other establishments. Approximately 1,500 of the university's 23,000 students hail from overseas. With students from over 100 different countries and regions, the university's campuses boast a rich cultural diversity.

Time Table on March 29th (Friday)

Morning: Laboratory Tour _Yoshida-Campus, Kyoto University	
10:00-10:40	Yuichi NAKAMURA Laboratory http://www.ccm.media.kyoto-u.ac.jp/
10:50-11:30	Tatsuya KAWAHARA Laboratory http://www.ar.media.kyoto-u.ac.jp/EN/
Afternoon: Symposium _The Clock Tower Centennial Hall, Kyoto University	
13:00	Opening Remark
13:10-15:10	**PROBLEMS FOR FIELD BASED DESIGN**
	Session One: Health Information System Field Informatics in Disaster/Disease Situational Analysis and Intervention *Prof. Jiming LIU (HKBU)* History of MML (Medical Markup Language) and its application for EHR (Dolphin Project) in Japan *Prof. Hiroyuki YOSHIHARA (Kyoto U)* **Session Two: Interaction Design for Everyday Life** Recommender System & Its Application in Healthcare *Dr. Li CHEN (HKBU)* Lifelog-style Experience Recording and Analysis for Group Activities *Prof. Yuichi NAKAMURA (Kyoto U)*
15:10-15:30	Break
15:30-17:30	**BASICS FOR FIELD BASED DESIGN**
	Session Three: Learning from Field Data A Unified Metric for Categorical and Numerical Attributes in Data Clustering *Dr. Yiu Ming Cheung (HKBU)* Complex Data Mining for Human Interaction Analysis *Dr. William Cheung (HKBU)* Virtual Sensing Technology in the Process Industry *Prof. Manabu Kano (Kyoto U)* **Session Four: Basic Research for Field Informatics** Augmenting Image Semantics Through Web Distances *Prof. Clement Leung (HKBU)* Signal Processing via Sampled-data Control - Beyond Shannon *Prof. Yutaka Yamamoto (Kyoto U)*
17:30	Closing Remark
	Banquet

Time Table on March 30th (Saturday)

Morning: PhD Student Forum	
09:30-09:48	Supporting Non-Expert Translators with Language Services *Ari Hautasaari (Kyoto U)*
09:48-10:06	Semantic Image Retrieval- A Picture is Worth a Thousand Words *Yuanxi Li (HKBU)*
10:06-10:24	Discovering Landscapes of Images and Text *Zhao Meng (Kyoto U)*
10:24-10:42	Infectious Disease Control: Voluntary Vaccination & Human Decision Making *Shang Xia (HKBU)*
10:42-11:00	Search for Complex Objects based on Combination of Attributes & their Affinity *Kosetsu Tsukuda (Kyoto U)*
11:00-11:18	Location-Aware Workflow Recovery via Petri Net Learning *Chen Li (HKBU)*
11:18-11:36	Predicting Next Query Reformulation Type From Current Search Behavior *Kazutoshi Umemoto (Kyoto U)*
11:36-11:54	Querying a Graph Database You can Trust *Zhe Fan (HKBU)*
11:54-12:12	Low Value Answers as Q&A Strategy *Andrew Vargo (Kyoto U)*
12:12-12:30	Clustering Analysis of Gene Expression Data without Knowing Cluster Number *Hong Jia (HKBU)*
12:30	Closing Remark
Afternoon: Social Event	

Problems for Field Based Design

Session One: Health Information Systems

Field Informatics in Disaster/Disease Situational Analysis and Intervention

Professor Jiming LIU (Hong Kong Baptist University)

Abstract
The aim of my talk is to discuss how field-based informatics can play a unique role in tackling some of the real-world challenges that may affect human well-being and health under special circumstances. In particular, I will try to present the needs and considerations of data-driven complex systems modeling for gaining new insights into the epidemiology of disasters and diseases, which often involves both intrinsic (endogenous) and extrinsic (exogenous) impact factors dynamically acting and interacting at multiple temporal and spatial scales.

Biography of Professor LIU
Professor Jiming Liu (Ph.D) is the Chair Professor and Associate Dean of the Department of Computer Science at Hong Kong Baptist University. Professor Liu received his doctorate in Electrical Engineering from McGill University in Montreal, Quebec, Canada. Professor Liu has received the President's Award for Outstanding Performance in Scholarly Work at Hong Kong Baptist University in 2007, and was named as a IEEE Fellow in 2011 for his work in Multi-Agent Autonomy-Oriented Computing and Web Intelligence.

History of MML (Medical Markup Language) and its application for EHR (Dolphin Project) in Japan

Professor Hiroyuki Yoshihara (Kyoto University)

Abstract
Since the Ministry of Health, Labor, and Welfare (MHLW) issued its notice in April 1999 (approving the electronic storage of medical records), the introduction of electronic medical records at national universities, key regional hospitals, clinics, and other facilities has advanced. It should be noted that behind this trend and in line with the e-Japan concept there has been financial support from the MHLW and Ministry of Economy, Trade and Industry (METI).

We, in 2001 "Regionally Shared Electronic Medical Record System Research and Development Project (METI)," proposed project plan via the Miyazaki and Kumamoto regions, and the project was adopted forboth regions. Thereupon, the joint development of a commonly accessible system began as the Dolphin Project. The Dolphin system was created to improve patient service, improve the quality of medical care, and achieve efficient medical care. A Data Center (iDolphin) was established to accumulate and manage clinical information in the regions and share clinical information safely and appropriately. The system has already been in operation for more 11 years. Even though a patient may have been examined at multiple hospitals, his medical record information will be integrated at the Center. This ensures medical care continuity and enables the patient to view his own medical records at home. Its usefulness in obtaining informed consent has been demonstrated as well. XML instances established in the MML standards (Medical Markup Language) are used for Electronic Medical Record System data exchange between the Data Center and each medical institution. The openness provided by

XML makes it possible to connect diverse electronic medical records to the Center. As of the year 2007, four Data Centers has been established in Japan (Miyazaki, Kumamoto, Kyoto and Tokyo).
In order to provide a nation-wide information service, Super Dolphin Project started in 2005. The Super Dolphin Server has two important functions. The first one is super directory by which a patient can search his medical records over the plural data centers. The second one is data mapping function which can convert a type of XML instance to another one. Using this Super site, a nation-wide medical data exchange became possible.

Biography of Professor YOSHIHARA
Professor Hiroyuki Yoshihara, (MD, Ph.D) is the Director of Medical Information Technology and Administration Planning at Kyoto University as well as the CIO of Kyoto University Hospital. He received his doctorates from the Graduate School of Medicine at Miyazaki Medical College. He has served in the past as a visiting professor at Harvard University and Dalian Medical University, and has been a Chief Researcher for the Ministry of Health and Welfare in Japan.

Session Two: Interaction Design for Everyday Life

Recommender System & Its Application in Healthcare

Dr. Li Chen (Hong Kong Baptist University)

Abstract
Recommender system has emerged as an important application in the current online environment, for aiding users to efficiently locate items that are personalized to their interests. In the past years, we have been engaged in improving the current algorithms and user interface designs through incorporating tags, reviews and social relationships. In this talk, I will introduce our previous findings and then indicate how they could be extended to develop recommender systems in the healthcare domain. The survey on related healthcare systems will also be briefly presented.

Biography of Dr. CHEN
Dr. Li Chen (Ph.D) is an Assistant Professor in the Department of Computer Science at Hong Kong Baptist University. She obtained her doctorate the Swiss Federal Institute of Technology in Lausanne in Human Computer Interaction. Professor Chen's research focuses on the development of intelligent and adaptive user interfaces.

Lifelog-style Experience Recording and Analysis for Group Activities

Professor Yuichi Nakamura (Kyoto University)

Abstract
We introduce a scheme of recording activities through collective first-person-view (FPV) videos, which are captured by small cameras mounted on our heads. This framework empowers learning in various styles such as an outdoor study for nature understanding, project-based-learning, and a field work in education. Methods for vision-based analysis and visualization, such as scene reconstruction, attention
visualization, etc. are presented in detail.

Biography of Professor NAKAMURA
Professor Yuichi Nakamura (Ph.D.) is a professor at the Academic Center of Computing and Media Studies at Kyoto University. Professor Nakamura received his doctorate in Electrical Engineering from Kyoto University. Professor Nakamura's research interests are in Human Behavior Recognition, Intelligent Media, Distant Learning, and Natural Language Processing.

Basics for Field Based Design

Session Three: Learning from Field Data

A Unified Metric for Categorical and Numerical Attributes in Data Clustering

Dr. Yiu Ming Cheung (Hong Kong Baptist University)

Abstract
Most of the existing clustering approaches are applicable to purely numerical or categorical data only, but not both. In general, it is a nontrivial task to perform clustering on mixed data composed of numerical and categorical attributes because there exists an awkward gap between the similarity metrics for categorical and numerical data. This talk therefore presents a general clustering framework based on the concept of object-cluster similarity and gives a unified similarity metric which can be simply applied to the data with categorical, numerical, or mixed attributes. Accordingly, an iterative clustering algorithm is developed, whose efficacy is experimentally demonstrated on different benchmark data sets.

Biography of Dr. CHEUNG
Dr. Yiu Ming Cheung (Ph.D) is a professor in the Department of Computer Science at Hong Kong Baptist University. He received his his doctorate from the Department of Computer Science and Engineering at The Chinese University of Hong Kong. Professor Cheung's research interests include Machine Learning, Pattern Recognition, Image Processing, and Watermarking. He is the founding Chairman of IEEE Hong Kong Chapter for Computational Intelligence.

Complex Data Mining for Human Interaction Analysis

Dr. William Cheung (Hong Kong Baptist University)

Abstract
Digital traces regarding how we live and how we work are now easily accessible due to the wide adoption of on-line social networks, smart devices, etc. Behaviors of inter-related individuals and their interaction can be reflected in such digital traces which often require data representation of more complex types, e.g., temporal networks, workflow traces. In this talk, I will first give an overview of some related complex data mining problems that we are interested in. Then I will introduce in more detail our recent work on using the probabilistic approach for detecting temporal network motif detection to study the underlying network formation mechanisms. The data sets used for the experiments include phone call records and interactions in online social networks.

Biography of Dr. CHEUNG
Dr. William Cheung (Ph.D) is an Associate Professor at the Department of Computer Science at Hong Kong Baptist University. He is also the Associate Director at the Centre for e-Transformation Research at HKBU. Professor Cheung obtained his doctorate in Computer Science from Hong Kong Baptist University. Professor Cheung's research interests are in Machine Learning, Artificial Intelligence, and Patter Recognition within the contexts of Data Mining, Recommender Systems, and Web and Grid Service Management.

Virtual Sensing Technology in the Process Industry

Professor Manabu Kano (Kyoto University)

Abstract
Virtual sensing technology has been widely used in various industrial processes to realize high product quality and productivity, because product quality is not usually measured in real time due to high investment and maintenance cost of on-line analyzers. Although virtual sensors or soft-sensors are usually realized as statistical models built from process operation data, our recent questionnaire survey confirms that the most critical issue is the model maintenance to prevent performance degradation. Since model maintenance or reconstruction is demanding for operators and engineers, adaptive modeling techniques that can maintain high prediction accuracy need to be developed. To settle this issue, Just-In-Time modeling has been developed and successfully applied to various processes in various industries. The potential of Just-In-Time modeling, in particular, Locally Weighted Partial Least Squares (LW-PLS), is demonstrated through latest applications in the petrochemical, steel, semiconductor, and pharmaceutical industries.

Biography of Professor KANO
Professor Manabu Kano (Ph.D.) is a professor in the Department of Systems Sciences in the Graduate School of Informatics at Kyoto University. Professor Kano received his doctorate in engineering from the University of Kyoto. Professor Kano's research interests are in Product Quality and Yield Improvement via Process Data Analysis, the Design and Operation of Micro Chemical Professes, and Softsensor and Virtual Sensor Design.

Session Four: Basic Research for Field Informatics

Augmenting Image Semantics Through Web Distances

Professor Clement Leung (Hong Kong Baptist University)

Abstract
A key component in social networking and information sharing relates to photographs and images which possess a unique degree of expressiveness exceeding words. Many digital images are created and eventually uploaded on the Internet, resulting in unprecedented growth in the demand for flexible and robust mechanisms to support the semantic search of Web images. While the content-based method, which is based on the low-level features extracted automatically from images, has become relatively mature, users nowadays are mostly interested in the semantic meaning of the images. Most such search on the Internet relies on a primitive level of information given in the image captions or manually provided tags, which are often incomplete and biased, and is unable to adequately capture the underlying search intentions and requirements of the users. In addition, the connotation of some search concepts tends to follow dynamic trends and social usage, and their interpretation as well as relationship with other concepts is constantly changing over time. Thus, the characteristics of a competent Web image search mechanism should include effectively catering for such dynamic elements. In this talk, we shall examine mechanisms to harness the semantic knowledge of the Web and apply it to the retrieval of Web images. In particular, we shall focus on the use of various Web distances to augment and enrich the semantics of images.

Biography of Professor LEUNG
Professor Clement Leung (Ph.D) is a professor in the Department of Computer Science at Hong Kong Baptist University. He received his doctorate from the Department of Computer Science from the University of London. His research interests include Digital Multimedia and Pattern Recognition.

Signal Processing via Sampled-data Control - Beyond Shannon

Professor Yutaka Yamamoto (Kyoto University)

Abstract
There has been remarkable progress in sampled-data control theory in the last two decades. The main achievement here is that there exists a digital (discrete-time) control law that takes the inter-sample behavior into account and makes the overall analog (continuous-time) performance optimal, in the sense of H-infinity norm. This naturally suggests its application to digital signal processing where the same hybrid nature of analog and digital is always prevalent. A crucial observation here is that the perfect band-limiting hypothesis, widely accepted in signal processing, is often inadequate for many practical situations. In practice, the original analog signals (sounds, images, etc.) are neither fully band-limited nor even close to be band-limited in the current processing standards. The problem is to interpolate high-frequency components beyond the so-called Nyquist frequency, and this is nothing but the inter-sample signals discarded through sampling. Assuming a natural signal generator model, sampled-data control theory provides an optimal platform for such problems. This new method has been implemented to a custom LSI chips by SANYO cor., and has made success of producing over 40 million chips. This talk provides a new problem formulation, design procedure, and various applications in sound processing and image processing.

Biography of Professor YAMAMOTO
Professor Yutaka Yamamoto (Ph.D.) is a professor in the Department of Applied Analysis and Complex Dynamical Systems. He received his doctorate in Mathematics from the University of Florida. Professor Yamamoto serves as the President of IEEE Control Systems Society.

Ph.D Student Forum

Supporting Non-Expert Translators with Language Services

Ari Hautasaari (Kyoto University)

Abstract
Wikipedia translation activities aim to improve the quality of the multilingual Wikipedia through article translation. While Wikipedia article translation is a collaborative effort, there has been little previous work done regarding the activities of individual volunteer translators, or casual Wikipedia users. This talk presents the results of an Activity Analysis of the translation work done by individual English to Chinese non-expert translators, who translated linguistically complex Wikipedia articles in a laboratory setting. Based on the Activity Analysis results, we introduced user created domain specific bilingual dictionaries as supporting tools for the non-expert translators. We show how the user created domain specific bilingual dictionaries significantly lowered the time spent on article translation, as well as information search activities during a Wikipedia article translation task, and discuss the effects of user created dictionaries on the work practices of bilingual non-expert contributors.

Semantic Image Retrieval - A Picture is Worth a Thousand Words

Yuanxi Li (Hong Kong Baptist University)

Abstract
With the number of social networking and photograph sharing sites growing at an unprecedented pace, image search queries has become a popular and frequent activity for Internet users, and this has become increasingly challenging due to both the large number of sites dedicated to image hosting as well as the number of conventional sites incorporating significant image elements. Such a trend is expected to accelerate with the diverse types of devices that are able to capture digital images, and the wide variety of software that are able to enhance, edit and create them. As the number of Web images continues to increase, searching them efficiently and semantically becomes an important challenge. To meet this challenge, we present a comprehensive fully automated approach based on the analysis of image metadata in conjunction with image analysis techniques. So that we can make the images talk and express themselves automatically rather than manually adding annotations.

Discovering Landscapes of Images and Text

Zhao Meng (Hong Kong Baptist University)

Abstract
With the help of state-of-the-art information retrieval technologies, most relevant documents/images come to the very top of ranked list in the response of user's query. However, "surrounding information" is not easy to encounter. For example, in text architecture, it is difficult to search the cause, details, development and result of a certain news event and of course we cannot point out where we are in search space. In image architecture, it is difficult to find out physical surroundings, even by searching similar images of a given one. In our work, we define two kinds of landscapes, a semantic one for text and a physical one for image. We introduce a framework to (1) present the whole landscape view of related information according to a user-indicated document in order to show a complete knowledge environment, (2) discover a certain landscape by user-indicated image(s) and then find similar ones.

Infectious Disease Control: Vaccination and Human Behavior

Shang Xia (Hong Kong Baptist University)

Abstract
In controlling the spread of an infectious disease, individual's voluntary vaccination plays an important role in affecting the coverage of a vaccination program. Empirical studies have shown that individuals' vaccination decisions can be subjected to multiple factors, including their perceived risks of disease and vaccine, socioeconomic considerations, as well as the influence of their engaged social environment. In this talk, we will introduce our recent progress on the development a computational modeling framework that characterizes and investigates individuals' vaccination decision making during an epidemic. We have considered an individual's decision on whether or not to take vaccine from the following three aspects: (1) risk and benefit analysis; (2) impact of social influence; (3) awareness of disease and vaccine related negative events.

Search for Complex Objects based on Combination of Attributes and their Affinity

Kosetsu Tsukuda (Kyoto University)

Abstract
This research aims to search for complex objects based on thecombination of objects' attributes and their affinity. We hypothesize that if all objects in a complex object have a same attribute or each has different attributes, the complex object has good affinity. For example, a complex object whose objects are "Kinkakuji," "Ginkakuji," and "Ryoanji" has good affinity because all objects have the attribute "Muromachi" in the viewpoint "era." In our methods, we first collect the attributes of all objects and cluster them so that each cluster represents a viewpoint. Then we investigate if each complex object has good affinity in each viewpoint. Our proposed methods enable users to search complex objects from various kinds of viewpoint

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Location-Aware Workflow Recovery via Petri Net Learning

Chen Li (Hong Kong Baptist University)

Abstract
Workflow mining focuses on discovering, analyzing and improving the underlying processes of a system using logs of events detected during the processes. Different from classical data mining techniques, workflow mining often relies on workflow models where process concurrency can be represented, and thus is more useful for process analysis. We are interested in extending workflow mining techniques to analyze the location-aware event logs which can be obtained in a smart environment with different sensors installed. In particular, we are interested in using Pet Net as the workflow model and are currently investigating the use of stochastic versions with the location information incorporated to achieve more robust workflow recovery. The workflows recovered can be interpreted as flows of human's activities where interesting flow patterns of activities can then be extracted and further analyzed.

Predicting Next Query Reformation Type form Current Search Behavior

Kazutoshi Umemoto (Kyoto University)

Abstract

This paper proposes a method to discover how a user's search intent changes during Web search using his/her behavior. A user has intent in his/her mind and formulates search queries according to the intent. It is, however, a difficult task for the user to obtain relevant documents that completely meet the intent with a single query. After issuing an initial query, the user usually examines the search results, and modifies the query. By recording various kinds of the user behavior and constructing a SVM classifier from the behavior data, we try to find the relationship between the user's query reformulation and user's behavior. Our experimental results show that the proposed method can predict the next query reformulation type using only the current search behavior data with 41% accuracy, greater than the baseline methods. We also analyze which and to what extent the user's behavior data is useful for the prediction

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Querying a Graph Database You can Trust

Zhe Fan (Hong Kong Baptist University)

Abstract:
There have been a wide range of emerging applications of graph structured data, e.g., bi-informatics, email connection, social network and web topology. To retrieve information from graph data, many structured queries have been proposed. Due to the complexity of maintenance of the increasing volume of graph structural data and graph queries, the employment of the query services, which are supported by high performance computing (e.g., cloud or clustered computers), have become a practical or even imperative choice. However, the main concern in the paradigm of employing query services is the security. (1) What if the query services are malicious and adversary? They may alter the graph data or the index structure, introduce wrong answers, skip certain answers or abort the evaluation. In this case, authenticated graph query services are needed; Or (2) what if the query services are curious? Companies (Users) may be unwilling to release (evaluate) their graph data (queries) to the public as they involve their confidential information, query services may be interested in inferring such information to obtain illegal profit. As a result, privacy preserving graph query services are in demanded. In this presentation, we highlight our recent progress on the above-mentioned two security issues.

Low Value Answers as Q&A Strategy

Andrew Vargo (Kyoto University)

Abstract
Question answering (Q&A) websites can be an important source of archived materials for many people and institutions. In the case of Stack Overflow, the Q&A system focuses on a relatively narrow subset of computer science related questions. The purpose of the this system is to create a corpus of highly accurate and easily searchable entries that encourage the growth of the field of computer science and its professionals. The users of the site are rewarded for the contributions with reputation points and powerful privileges that are linked to achieving reputation milestones. Reputation is meant to show the trustworthiness and skill of a member. It acts as an important signal to the community.
Previous research as often focused on content with high archival value. In the case of Stack Overflow, we see research that has been able to identify the long lasting archival of any question by how quickly it is answered and who answers it. Indeed, we now suspect that there is an informal structure in which questions filter through the most powerful users first. This brings us an important question: How do new users achieve reputation and privileges when such a strong hierarchical structure already exists?
In this research, we look at users who gained the rank compared to their previous standings in 2012. We find that most of the users answer questions with low archival value, but derive points from having their answers chosen as the best answer by the asker. We then look at the design implications for awarding power and reputation for low archival exchanges in comparison to high archival exchanges.

Clustering Analysis of Gene Expression Data without Knowing Cluster Number

Hong Jia (Hong Kong Baptist University)

Abstract
Clustering analysis on gene expression data is very helpful to understand gene function and reveal cellular processes. Its purpose is to find the natural data structures and obtain some initial knowledge about the data distribution. Generally, a clustering algorithm which needs less prior knowledge will be more favored. That is because this knowledge, such as the true number of clusters, is not always unavailable in advance. However, traditional clustering methods usually need the users to specify the exact number of clusters as an input; otherwise, they will almost always give out incorrect clustering results. In this talk, I will share my research work on the topic of clustering without knowing cluster number. Specially, a novel clustering algorithm, which implements two different kinds of competitive mechanisms (i.e., cooperation and penalization) simultaneously in a single competitive learning process, will be introduced. Experimental results on UCI data sets and gene expression data have shown the efficacy of this method.