



Applied Informatics and Media Design

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Proceedings of International Conference of Applied Informatics and Media Design 2019
California State University, Bakersfield [April 24-26, 2019]

Program at a Glance

IIAI-International Conference on Applied Informatics and Media Design (IIAI-AIMD2019)

April.24 – 26, 2019, California State University, Bakersfield, USA

April 24(Tue)

Room	401C
9:30AM-11:00AM	Registration & Welcome Coffee, Beverage
13:00PM-17:00PM	Chair Meeting (invitation only)

April 25(Wed)

Room	402D	407D
9:30AM-10:40AM		Registration & Welcome Coffee, Breakfast
10:40AM-11:40AM	Session1	
11:40AM-13:00PM	Coffee, Beverage service & Lunch on your own	
13:00PM-14:20PM	Session2	
14:20PM-14:30PM	Coffee break	
14:30PM-15:30PM	Session3	
15:30PM-15:40PM	Coffee break	
15:40PM-16:30PM	Session4	
16:30PM-17:00PM	Evening Beverage Break	
18:00PM-20:00PM	IIAI-AIMD2019 Banquet at Lengthwise (9000 Ming Ave, Bakersfield, CA 93311)	

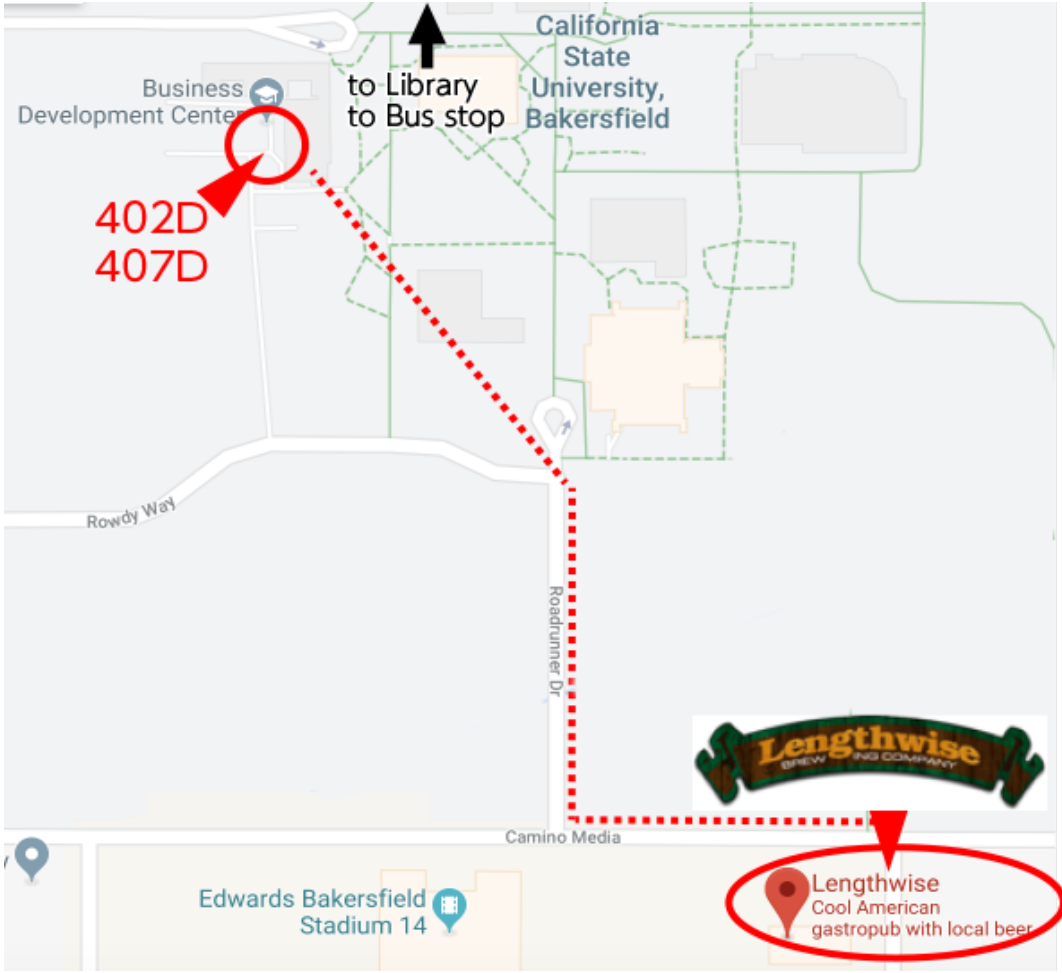
April 26(Thu)

Room	401C
9:30AM-11:00AM	Forum Discussion (invitation only)

IIAI-AIMD2019 Conference Program

April 25, 2019

Session 1		Room 402D
10:40-11:40 Session Chair : Wenjing Yang (University of Massachusetts Lowell)		
10:40-11:00	Optimization of Analog Representation in Digital Media for Book Apps	<i>Ziran Fan</i>
11:00-11:20	Education and Communication Research Using Robotics - Development of basic research elements -	<i>Junji Sone</i>
11:20-11:40	“Design of an Interface Supporting “Reading” Function on Smartphones”	<i>Yui Tanaka</i>
11:40~13:00	Lunch on your own & Coffee	
Session 2		Room 402D
13:00-14:20 Session Chair : Koji Fujita (Cyber University)		
13:00-13:20	A General Framework for Constructing Domain-specific Chatbots	<i>Wenjing Yang</i>
13:20-13:40	A Proposal for Communication System to Express Specific Nouns and Basic Actions in a Single Stroke	<i>Taishi Nemoto</i>
13:40-14:00	A proposal for a knowledge sharing system for the biological control in agriculture -Utilizing farmworkers’ field knowledge	<i>Masako Takatsu</i>
14:00-14:20	With Post-Internet Society, The Third Agent	<i>Takashi Shimizu</i>
14:20-14:30	Coffee break	
Session 3		Room 402D
14:30-15:40 Session Chair : Junji Sone (Tokyo Polytechnic University)		
14:30-14:50	Building an Analog Application to Limit Excessive Use of Smartphones	<i>Ziran Fan</i>
14:50-15:10	A Mechanism of Drawing Software that Provides a “Real Feel”	<i>Yulana Watanabe, Takayuki Fujimoto</i>
15:10-15:30	Digital Business Card Application Based on Face-to-Face Exchange	<i>Miki Sunakawa, Takayuki Fujimoto</i>

15:30-15:40	Coffee break
Session4 Room 402D 15:40-16:00 Session Chair : Ziran Fan (Toyo University)	
15:40-16:00	A Proposal for Building Remote Class Environment and Support System by “Low-Cost Computing” <i>Kazuya Murata</i>
16:00-16:20	University Students’ Practice of Performing Assignments Using Smartphone: Current State and Analysis <i>Koji Fujita</i>
16:30-17:00	Evening Beverage Break
18:00-20:00	<p>Banquet at Lengthwise</p>  <p style="text-align: center;">Lengthwise (address : 9000 Ming Ave, Bakersfield, CA 93311)</p>

Proceedings of IIAI-AIMD2019

Paper Title	Optimization of Analog Representation in Digital Media for Book Apps
Author	Ziran Fan (Institute of Human Sciences / Graduate School of Information Sciences and Arts, Toyo University)
Abstract	The most significant feature in application of digital technologies is that content never deteriorates. The appearance of digital content such as smartphone applications never changes even through long-term use. For example, books and paper publications get soiled and can earn aged look as you keep reading them, but this does not happen to electronic books. It means they would not produce perceptual usability because they do not deteriorate. It also means that you are not likely to feel an attachment to them if they lack in perceptual usability. Analog tools deteriorate through repeated use, which leads to changes in the appearance and more perceptual usability. This is the factor that makes people prefer analog tools. And it is also the primary reason why paper publications are still popular even in today's digital age. This study attempts to represent perceptual usability, a media feature of paper publications, on smartphones. It proposes to devise a digital book application as a new content design method which brings both digital convenience and analog perceptual usability.
Keywords	Digital Media / Analog tools / Paper Publications / Digital Representation Method / Computing Method

Paper Title	Education and Communication Research Using Robotics - Development of basic research elements -
Author	Junji Sone, Daisuke Katagami, Yuta Ogai, Tahahito Tomoto, Takenori Obo and Yoshihisa Udagawa (Faculty of Engineering Tokyo Polytechnic University)
Abstract	Psychological approach for education and communication robotics system based on learning theory, human agent interaction, biological analysis and cognitive science become more important for education, driving assistance and so on. Our system was integrated with advanced topics of information, biological and robotics researches.
Keywords	Education / Communication / Robotics / Basic research

Paper Title	Design of an Interface Supporting "Reading" Function on Smartphones
Author	Yui Tanaka (Graduate School of Information Sciences and Arts, Toyo University)
Abstract	The fast spread of smartphones in recent years is quite remarkable. This is because their operability has been greatly improved compared to that of feature phones. Recently, various applications specifically designed for more efficient "reading" on smartphone are being released. However, smartphone-based reading has some serious problems. Firstly, it is difficult to follow a line of text. Secondly, there is another issue: accidentally tapping on advertisements (mistaps). These are the problems that significantly deteriorate the convenience of reading on smartphone. Therefore, in this research, in order to improve readability on smartphones, we aim to develop interfaces and applications that solve these two problems.
Keywords	IT / Smartphone Application / Readability / Smartphone Case / Human Interface / Internet of Things Introduction

Paper Title	A General Framework for Constructing Domain-specific Chatbots
Author	Wenjing Yang (Department of Computer Science University of Massachusetts Lowell) Cheng Zhang (Department of Computer Science University of Massachusetts Lowell) Jie Wang (Department of Computer Science University of Massachusetts Lowell)
Abstract	This paper presents an easy-to-deploy general framework for chatbot builders to construct domain-specific chatbots called dChat, which performs the following tasks: (1) Collect domain-specific query-answer pairs (QAPs) from community-based question-answering websites and generate new QAPs suitable for human-chatbot conversations. (2) Construct a chatbot for a specific domain. (3) Switch domains based on user queries. In particular, dChat improves previous work by adding domain classifications and Word2Vec keyword searches. Comparing SVM and CNN classifiers trained on domain-specific QAPs we collected, we show that SVM provides much higher F1 scores on user queries. We then apply WMD (Word Mover's Distance) to find semantic relationships between queries and search for the most appropriate answer to the user query. Experimental results show that dChat achieves an 8.4% increase of accuracy over previous results on selecting answers.
Keywords	Chatbot / Information Retrieval / Question-Answer System / Text Classification / Word Mover's Distance

Paper Title	A Proposal for Communication System to Express Specific Nouns and Basic Actions in a Single Stroke
Author	Taishi Nemoto (Graduate School of Information Sciences and Arts, Toyo University)
Abstract	In recent years, there is a rapid increase in communication on social networking services (SNSs) or messenger applications. Such communication is prevailing for, for example, from everyday casual content to a wide range of fields such as education and business. It can be said that such communication has become indispensable to people's lives already. In addition to characters, sharing images as media called stickers, it is common to see scenes of interaction. Visual information has more informative than character information (linguistic information), and visual information is easiest way to transmit. However, Focusing on the use of smartphones in recent years, the use of the previous-generation personal computer influences a lot. One example is a keyboard of a smartphone for text entry. The QWERTY keyboard was designed for typewriters, and also people are familiar with this tool on PC, however, it is not optimized for smartphones. This input method is based on characters (alphabet), and not for the visual communication age. In this research, we present relevant examples of the input interfaces of smartphones and suggest the concept of simple stroke communication tool by which the users can communicate with each other intuitively.
Keywords	SNS / Media / Information / Smartphone

Paper Title	A proposal for a knowledge sharing system for the biological control in agriculture -Utilizing farmworkers' field knowledge
Author	Masako Takatsu (Graduate School of Bio-Applications and Systems Engineering, Tokyo University of Agriculture and Technology)
Abstract	Biological control is a method for suppressing agricultural pest populations by applying agents derived from natural resources. Currently, there is a social demand to reduce chemical pesticides use because of environmental issues and potential hazards to human health. Therefore, exploring the effective way to apply biological control is needed. Here we propose a system for utilizing farmworkers' observations to develop and optimize biological control agents.
Keywords	Sustainable agriculture / Biological control / Biopesticides / Entomology / Big data / Ecoinformatics / Agro informatics / Regional research Indigenous Technical knowledge / Farmer Participatory Research

Paper Title	With Post-Internet Society, The Third Agent
Author	Takashi Shimizu (Faculty of Information Sciences and Arts, Toyo University)
Abstract	In the increasingly ubiquitous world of IoT, what is the "medium" that brings about many workings? The theme of this paper is the search for things that will alleviate excessive interference and act as arbiters for the interactions between things and people, people and people, and things and things.
Keywords	Keywords-component / Internet Society / Post-Internet Society / Third Agent / Medium / Smart Contracts

Paper Title	Building an Analog Application to Limit Excessive Use of Smartphones
Author	Ziran Fan (Institute of Human Sciences / Graduate School of Information Sciences and Arts, Toyo University)
Abstract	Users tend to use smartphones immoderately over the planned use time. Various methods have been developed to control the time spent on smartphone. However, most methods have limited control over the use of applications for particular purposes such as gaming, using SNS and viewing videos, and they are not good enough to control the use of smartphone itself. As examined by the authors, no prevention methods are successful in limiting the excessive use of smartphone. This study focuses on the battery, the mechanical factor of smartphone. Applying the analog motif that machines cannot work without fuel, we intendedly incorporate in smartphones the mechanism in which smartphone use would be unavoidably suspended if the battery got consumed. We propose a new method to limit the time on smartphone by controlling the battery consumption. This study examines the situation around the smartphone battery consumption, and identifies the functions which heavily consume battery. Then, we focus on the two functions, i.e., "network communication" and "updating GPS location information", and propose an application that provides these functions. We will propose an application designed to adjust the battery consumption based on the actual usage, and consider a controlling method to limit the time on smartphone, which suits today's user lifestyle.
Keywords	Digital Media / Analog Design Method / Smartphone Usage Control / Battery Consumption / Application Design

Paper Title	A Mechanism of Drawing Software that Provides a "Real Feel"
Author	Yulana Watanabe(Graduate School of Information Sciences and Arts, Toyo University) Ziran Fan (Institute of Human Sciences / Graduate School of Information Sciences and Arts, Toyo University)
Abstract	To this day, human beings have drawn or painted pictures in various ways. The methods for different types of pictures, including murals and ink paintings, have been constantly changing with time. People start drawing with crayons on drawing paper as part of child's play. When they grow up, they learn as students in art class how to sketch on paper by drawing with pencil. As they age, people also enjoy the act of painting as a hobby through painting with brush and oils on canvas, or painting with watercolors on postcards. On the other hand, today many people possess computers and draw pictures using digital equipment. Devices are used for many different purposes, sometimes serving as writing instruments or tools for drawing pictures. Today, drawing software has become one of the major methods of drawing pictures. Drawing with the use of computer has become an entirely new drawing method, and is not a substitute for conventional drawing with "paper and drawing instrument". Multifunctional drawing

software produces many new expressions, and creators greatly benefit from using them. However, some disadvantages can also be pointed out. When using computer as a machine, you cannot get the “realistic experience of physically using” the surface materials and tools that you would get when using "paper and drawing instruments". Just as leading creators care so much about tools, the "real feel of using” the tools has a great impact on their work efficiency and motivation. In this research, we propose a drawing software which overcomes this disadvantage and provides the "real feel of using” the tools.

Keywords IT / Drawing software / Real feel / Sound effects / Visual effects / Application / Analog on Digital / Virtual Reality / Augmented Reality / Digital Design / Computer Graphics

Paper Title

Digital Business Card Application Based on Face-to-Face Exchange

Author Miki Sunakawa (Graduate School of Information Sciences and Arts, Toyo University)
Yui Tanaka (Graduate School of Information Sciences and Arts, Toyo University)

Abstract A business card displays an individual’s business information in a compact manner, allowing one to efficiently provide his/her information. The number of paper business cards keeps growing, making it difficult to organize them and track who stores them. In recent years, there are services that convert the information into data which can be managed using personal computers or smartphones. With these services, search ability can be improved by sharing the information from the business cards, but scanning and typing work entails as cards increase. In addition to the trouble, spelling errors and omissions can occur. Therefore, new services are also available to digitally create business cards, and let users distribute and manage the data. They look efficient and convenient as they make it easy to send business card data and have the data changes automatically sync with the cloud service. However, paper business cards make it possible for you to exchange them by “physically handing them in person” and thereby leave an impression and impact on the other person, even though they carry the same information as digital cards. In this research, we propose a "digital business card that enables you to give and receive one by actually meeting face-to-face" just like traditional paper business cards do. It is an application which uses the smartphone device itself as a business card, and exchanges only the information as digital data. By approaching the other device with the business card displayed on the screen, the business card files are exchanged between the app users through Bluetooth. In addition, we also propose embedding a 15-second video in the business card file as a function that makes use of the characteristics of digital business cards.

Keywords IT / Smartphone Application / Digital business card

Paper Title

A Proposal for Building Remote Class Environment and Support System by “Low-Cost Computing”

Author Kazuya Murata (Institute of Human Sciences / Graduate School of Information Sciences and Arts, Toyo University)

Abstract Today, with the spread of computers and networks, various media utilizing the network are evolving. Among them, “remote class”, which universities offer by utilizing the media, has been drawing much attention in recent years. When universities or other institutions intend to offer remote classes, there are two different methods. One is a “simultaneous interactive” class offered by using dedicated hardware. The other is “on-demand” class offered by using the network. For on-demand classes, large-scale, dedicated equipment is required. For this reason, they are being offered by some universities where facilities for such equipment are available. On the other hand, for most universities, it is quite difficult to offer on-demand remote classes due to the lack of such facilities. Therefore, the “simultaneous interactive” method is employed by most universities when they offer online classes. In the past, simultaneous interactive classes were delivered using dedicated hardware. This is because a stable communication environment had to be ensured at all times. However, with the remarkable

progress in computer development in recent years, it has become easy for anyone to secure a stable communication environment. Therefore, in this research, we seek to build an environment which delivers “simultaneous interactive” remote class at the lowest cost possible without using the dedicated hardware, but by using free or low-cost software. In this way, here we define “Low-cost Computing” as a method to build a “system that demonstrates high performance at an extremely low cost by combining existing systems”. This research especially focuses on the field of “remote class” and aims at building a remote class environment which is inexpensive and can be used by anyone.

Keywords Remote Class / Simultaneous Interactive / Low-Cost Computing

Paper Title **University Students’ Practice of Performing Assignments Using Smartphone:
Current State and Analysis**

Author Koji Fujita (Faculty of Information Technology and Business, Cyber University)

Abstract Today, everyone has a smartphone and it has become an indispensable item in everyday life. In addition, in distance-learning programs offered by an increasing number of universities, students can now take classes, submit assignments and earn bachelor’s degree exclusively by using smartphones. Regular university/program is no exception to this trend. More and more class assignments are now being submitted using smartphone. In creating reports, too, current smartphone functions enable students to briefly check assignments in Word, Excel or PowerPoint, submit them, or create a part of the report by using notes on the smartphone. It is possible to create the entire report or, if not, part of it on a smartphone. Hence, we assumed that, in general, students actually use their smartphones for creating reports. In this research, we conducted a questionnaire survey for university students to investigate how smartphone is used for assignment creation. Based on the results, we listed possible future improvements in smartphone-based report creation, and analyzed the agenda items.

Keywords Smartphone / e-learning / Text input / Interface / Assignment / Questionnaire survey