WORKSHOPS AND TUTORIALS

W1. Medical Informatics
(Full Day Workshop on the 11-Dec-2013 from 09.00 to 16.30)

Resource person: **Dr. Chamidu Atupelage, Dr. Ruwan Ranaweera, Dr. Mohan Jayathilake, Dr. Roshan Yapa, Dr. Amalka Pinidiyaarachchi and Dr. Anuja Dharmarathne.**

During last few decades, medical experts massively collaborate with the engineers to develop advanced techniques and tools for improving the significances of medical diagnosing techniques. Especially, with the development of high-resolution imaging devices and high-spec computers modeling the medical specialists' knowledge into mathematical methods has become real-time practical problems. This workshop aims to introduce and hands on cutting-edge medical informatics technologies.

Specially suitable for Medical doctors, bioinformaticians, post-graduate medical informaticians, etc.

W2. e-Waste and Green Computing

(Full Day Symposium on the 11-Dec-2013 from 09.00 to 16.30)

Resource Persons: ***Mr. Harsha Wijewardana, Mr. A. M. S. C. M. B. Attanayake, Mr. Kuganathan and Mr. F. Hudah***

The Government of Sri Lanka announced not long ago that general populace of Sri Lanka is in possession of more than twenty million mobile phones: in other words the number of phones had surpassed the population of this tiny nation. Although this was hailed as a remarkable achievement keeping pace with other nations in Asia in mobile communication, it also poses threat to our fragile environment as these phones reach their End of Life (EOL) if it is not addressed properly. These tiny digital devices have short life span and some will reach their EOL in less than three years. These devices including computers are made of toxic materials such as lead, copper and mercury. As they reach EOL they become eWaste and haphazard dumping of these will harm our eco system polluting our water and soil. When these toxic materials are in our water and soil, they will also enter into our food chain and many of these toxic materials are carcinogens and cause many other diseases.

Green Computing is defined as the practice of environmentally sustainable Computing or IT. Green computing covers whole life cycle of computers and digital devices which include use of less energy to disposing of servers, computers, network accessories etc.

As mentioned previously, using less energy or less electricity to power computers has become a major part of Green Computing and industrialized world has contributed much of the emission of carbon into the environment as a result of generation of energy using fossil fuel and many other nations such as China, Brazil and India are joining the ranks of high users of fossil fuel as they industrialized at a faster pace. It is said that rise of CO2 has contributed to the raising of global environmental temperature in general; and it is expected with the melting of polar caps, the water

levels of our oceans to rise submerging some of our low lying areas in our country; and some tiny island nations may disappear from the world map altogether. Some scientists attribute change in our climate to the rise of temperature worldwide and it will have a huge impact on our food sources threatening worldwide food shortage in a few years.

This workshop will introduce what eWaste and Green Computing is; and it is further expected to impart the best practices which have been adopted worldwide and in Sri Lanka to practice Green Computing with elaboration of worldwide standards. It will also try to introduce Carbon Trading which is practiced many of Sri Lankan Exporters. The organizers of workshop expect that this workshop will become a platform for initiating a dialog in eWaste and Green Computing in Sri Lanka.

W3. Cloud Computing in Software Development
(Full Day Workshop on the 11-Dec-2013 from 09.00 to 16.30)

Conducted by the 99x Technologies, Resource Persons: ***Mr.Samudra Kanankearachchi, Mr.Chatura De Silva, Mr.Geethanga Amarasinghe, Mr.Chathuranga Bandara and Mr.Kalanamith Mannapperuma***

Keywords: Cloud Computing, Process distribution, Multi-tenancy, Cloud Security

Cloud computing is an emerging paradigm of the service based software industry which subjected to diverse research attempts for last few years. This long-held dream of software as a service is applied in various domains showcasing its strength and versatile applicability. This workshop will cover cloud computing considering, aforementioned great applicability and ability that it has imparted to software development employing various cutting edge technologies. As cloud computing is based on well-defined set of concepts, workshop will also provide better explanation of these concepts for those who like to seek and explore this trendsetting domain and state-of-the-art technologies. Nevertheless, workshop is designed in such a way to provide in-depth knowledge from the fundamental concepts to the hands on experience in cloud based technologies. Though the main focus of this workshop is on cloud computing, this will extend its coverage to related concepts and techniques as well which are associated with cloud computing. Therefore, security, scalability and layering in cloud based environment will also be considered and will be deeply discussed in this workshop. Moving few steps further, this workshop will provide practical exposure of architectural building blocks of cloud environment concerning cloud balancing, cloud bursting architectures and clustering techniques. With this coverage of advance topics in cloud computing, experience sharing sessions will also be held to contribute to the software community. Providing coverage for all above mentioned areas, workshop will be consisted of 8 sessions including a special session allocated to discuss future dimensions and directions of the cloud computing where industry experts will provide the exposure in a more interactive environment.

W4. Low Cost Immersive VR Simulations for Industrial Applications and Serious Games
(Full Day Workshop on the 11-Dec-2013 from 09.00 to 16.30)

Resource Persons: ***Prof. N. D. Kodikara, Prof. Rexy Rosa, Mr. Y Prabath Samarasinghe and Mr. Damitha Sandaruwan***

The performance of computer hardware has improved tremendously over the past decade and the cost has also gone down.It is now possible to use commodity-off-the-shelf (COTS) hardware to model real world physics in real time with the accuracy required for VR based simulations.In addition, there are free and open source software (FOSS) packages that could be used to build physics simulators and rendering engines to create the virtualenvironments. Accordingly, low cost serious games equal to commercial high end simulators can be developed using off-the-shelf hardware and open source softwarecomponents.This discussion focuses on the design challenges in developing immersive virtual reality solutions for serious games using COTS hardware and FOSS.The term serious game is very broad; it is not possible to address the design issues related to the broad spectrum of games covered by this term. In this discussion, we limit our focus on serious games usedfor training in handling vehicles, such as ships, flights, and cars in immersive virtual environments.In this workshop the VR solutions developed by modeling and simulation group of UCSC which were built using the COTShardware and FOSS will be discussed.

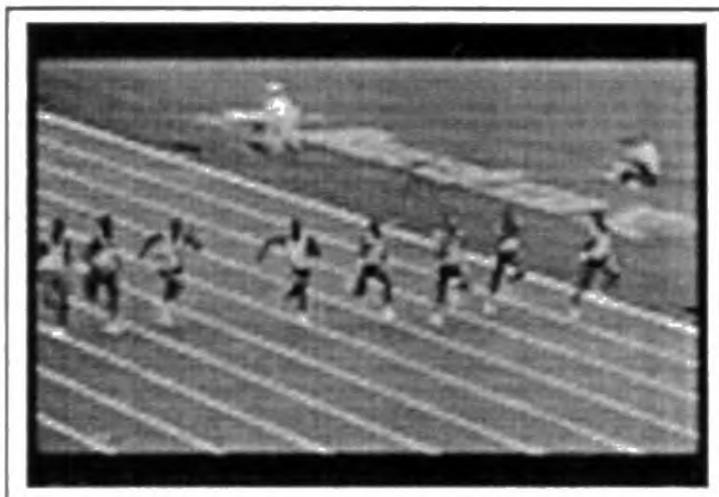
W5. Building Future Proof ERP
(Half Day Workshop on the 11-Dec-2013 from 09.00 to 12.30)

Conducted by IFS, Resource Persons: **Mr. Amil Kumarasinghe, Mr. Buddika Hiripitiyage and Mr. Sukitha Magallege**
Key words: Big Data, In-memory Databases, Real Time Network Surveillance, Cloud Computing, Mobile Computing, Responsive ERP

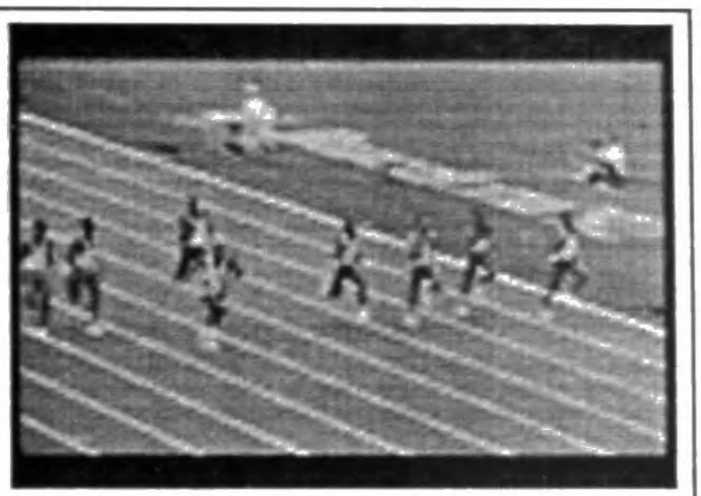
Modern day ERPs are feature creeps. They have a wide variety of features to facilitate today's endless requirements. They are used for all of the internal information systems of an organization and also connected to the external social networks, geospatial data services, mobile applications, third party systems, government tax information services, and the list follows. Every single code line added to the ERP must be added with all of those in mind plus the traditional checklist including performance, usability, clarity, user friendliness, security, scalability and so on. On the other hand, ERP applications contain lot of data that users access through its user interface. Interactions between users are captured in formal flows such as the progress of a defined work activity. However formal flows capture only a small portion of the actual activity that occurs on an instance of an application. Users access data in patterns in real time and collaborate with each other without acting on an activity in many daily business actions. These kinds of access patterns can provide rich insight into emergent business requirements and problems if they are processed, categorized and presented in real time. Handling of big data to derive decisions is possible by bringing together real time network traffic surveillance, in-memory databases and fast set based time segmentation of data in order to provide business insight to decision makers in real time. The workshop will discuss technical aspects of how to build future proof ERP while accomplishing the emerging market needs and simultaneously dealing with big data. Industry Experts will offer two unique interactive sessions that will cover the aforementioned aspects.

W6. Video Forgery and Motion Editing

(Full Day Workshop on the 14-Dec-2013 from 09.00 to 16.30)
Resource Person: ***Prof. Timothy K. Shih National Central University, Taiwan***



The Original Video



The Falsified Video

Video Forgery is a technique for generating fake video by altering, combining, or creating new video contents. We change the behavior of actors in a video. For instance, the outcome of a 100-meter race in the Olympic Game can be falsified. We track objects and segment motions using a modified mean shift mechanism. The resulting video layers can be played in different speeds and at different reference points with respect to the original video. In order to obtain a smooth movement of target objects, a motion interpolation mechanism is proposed based on reference stick figures (i.e., a structure of human skeleton) and video inpainting mechanism. The video inpainting mechanism is performed in a quasi-3D space via guided 3D patch matching. Interpolated target objects and background layers are fused. It is hard to tell whether a falsified video is the original. In addition, in this talk, we demonstrate a new technique to allow users to change the dynamic texture, used in a video background for special effect production. For instance, the dynamic texture of fire, smoke, water, cloud, and others can be edited through a series of automatic algorithms. Motion estimations of global and local textures are used. Video blending techniques are used in conjunction with a color balancing technique. The editing procedure will search for suitable patches in irregular shape blocks, to reproduce a realistic dynamic background, such as large waterfall, fire scene, or smoky background. The technique is suitable for making science fiction movies. We demonstrate the original and the falsified videos in our website at http://www.csie.ncu.edu.tw/~tshih. Although video falsifying may create a moral problem, our intension is to create special effects in movie industry.

W7. Mining Unstructured Text

(Full Day Tutorial on the 14-Dec-2013 from 09.00 to 16.30)

Resource Persons: ***Dr. A. Ruvan Weerasinghe and Mr. VirajWelgama***

Many real world applications require us to try and figure out the meaning of words and phrases in unstructured texts. While complex machine readable dictionaries may help, they require man

years of work to compile and so are not available for many languages. This tutorial will cover text mining techniques that can be used to make sense of words and phrases occurring in natural text using an open source toolkit (NLTK). It will give the participant a grasp of how to set about processing large unstructured texts in order to find out information contained in them. While many examples used in the tutorial will be in English, attention will also be given to issues surrounding the processing of Sinhala and Tamil data.
Organized by the Language Technology Research Laboratory (LTRL), University of Colombo School of Computing (UCSC)

W8. Computational Biology

(Full Day Totorial on the 14-Dec-2013 from 09.00 to 16.30)

Resource Persons: ***Prof. Mahesan Niranjan and Mrs. Rupika Wijesinghe***

This tutorial will review computational algorithms that are used in extracting useful information from complex biological datasets. We will start with an introduction to biology from an information perspective and outline the computational challenges. We will look at algorithms for sequence analysis such as dynamic programming and hidden Markov models; inference from high throughput experimental data via cluster analysis, classification and matrix factorization; and present an overview of parameter inference for systems biology models.

We will also use this opportunity to discuss how research activity in the topics of bioinformatics and computational biology may be triggered and sustained in the Sri Lankan environment with impact on biological, medical and agricultural sectors.

W9. One head, many hats: Cross disciplinary technological interventions

(Half Day Workshop on the 14-Dec-2013 from 09.00 to 12.30)

Resource Persons: ***Dr. Santosh Vijaykumar, Dr. Owen Noel Newton Fernando and Mr. Vajira Sampath Rathnayake***

The past decade has witnessed a rapid profusion of information and communication technology (ICT) based interventions in developing countries across domains such as public health, agriculture and education. The very nature of such interventions commands collaborations between people from a range of sectors (academia, industry, policymaking, etc.) sectors and disciplinary backgrounds (clinical sciences, social sciences, technology studies, etc.). While well intentioned, such collaborations can pose constant challenges in terms of optimizing the richness, and balancing the contributions of, each discipline. The purpose of this workshop is to offer ICTer practitioners and researchers an in-depth view of collaborative processes that involve a range of disciplines and brainstorm ideas on overcoming the key challenges in such situations. In doing so, a conceptual differentiation of three approaches – interdisciplinary, multidisciplinary and transdisciplinary – will be discussed. This will be followed by real-life case studies in executing such approaches based on projects at the Center of Social Media Innovations for Communities (COSMIC) at Singapore's Nanyang Technological University. The workshop will culminate with a team project comprising delegates from different disciplinary backgrounds who will construct a solution to a chronic developing world problem.

W10. Document Image Analysis and Recognition

(Half Day Totorial on the 14-Dec-2013 from 09.00 to 12.30)

Resource Persons: ***Professor Umapada Pal***

Document Image Analysis (DIA) is the process that performs the overall interpretation of document images. Along with the existing applications like reading aid for the blind, postal automation, bank check automation, nowadays document analysis techniques has been used in many new areas. For example, currently companies are interested in implementing digital mailrooms to improve the efficiency of paper-intensive workflows and to reduce the burden of information processing of incoming mails, faxes, forms, invoices, reports, employee records, etc. Multi-script document recognition, Historical document transcription, Word spotting, Video document analysis and recognition, etc. are other challenging areas. This tutorial talk will give overview in all important aspects of document image analysis and recognition areas to the participants. Also for better understanding the subjects, demonstrations of some DIA systems will be given to the audience. Finally, some open and new challenging problems will be discussed.

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