FROM HOD'S DESK

An organization, be it the industries or academics, depends on its criticalresources for its functioning and decision making. In today's times when we are confronted by economic recession, identification of an employee as a critical resource in an organization is not only a desirable quality but one which assures job security. It is in the interest of the individual to position himself / herself so that the management considers him/her an indispensable asset. This is the natural consequence of his / her problem solving /engineering skills valued by the organization along with his / her people management skills, ability to motivate the peers and take part in the decision making process.

We in the Computer Science and Engineering Department strive to align by Rajagiri's unique mission statement which emphasizes on enabling the students to face the challenges of life with courage and conviction. For us the mission statement translates into equipping the students with qualities which the industries consider valuable for their growth and success.

BIJU ABRAHAM N , HOD DCS

CSI Student Chapter, RASET- Inauguration

The Computer Society of India student branch of Rajagiri School of Engineering and Technology (RASET) was officially inaugurated on the 2nd of March, 2009. The chief guest for the day was Mr. G Vishwanathan, the former chairman of the CSI Cochin Chapter.

Meera Tom (S6 CS β) has been entrusted as the President and **Deepu Joseph** (S6 CS α) as the Vice President of the CSI Student chapter, RASET.

STUDENT CONVENTION

Computer Society of India Region VII Student Convention on "Transdisciplinary Software Engineering" 11-12 March 2009

Computer Society of India Region VII Student Convention on "Transdisciplinary Software Engineering" was formally inaugurated on 11th of March, 2009 at Rajagiri School of Engineering and Technology in Chavara Hall at 3.30 pm. The inauguration was marked by the lighting of the lamp by Dr. N. D. Inasu, the Pro Vice Chancellor of Cochin University of Science & Technology. He also delivered the inaugural address. Mrs. Mini Ulanat, Coordinator for Region VII CSI delivered vote of thanks.

The proceedings of students' convention (digital media) with ISBN 978-81-907960-0-2 was released by Rev Fr Jose Alex CMI and handed over the first copy to Dr. N. D. Inasu. The event was witnessed by over 500 students from Rajagiri School of Engineering & Technology and also from students from other states like Tamil Nadu, Pondicherry and Karnataka. Also a website was launched for the students' convention www.rasetconferences.com which contained all information regarding the convention and was regularly updated with events and program schedules related to the same.

Keynote Address

The key note address by Mr. Suresh Narayanan, FA Lead, Reliance Communications, on NGN (Next Generation Networks) aroused a lot of enthusiasm among students.

Invited Talk

On 12th of March, 2009 Mr. Dorai Thodla, an entrepreneur and founder of iMorph Inc., USA gave an expert talk on the topic Think about thinking and learn about learning, where he emphasized on the importance of thinking differently, and learning to develop a learning mentality among students. The talk motivated the student community to shower in a lot of questions to Mr Dorai Thodla, which he answered patiently and interestingly.

Paper Presentations

The student paper presentations followed, in which 16 papers were presented during the course of the day. The theme for the presentation included diverse topics in Transdisciplinary Software Engineering. Participants included students from colleges across Kerala, Tamil Nadu and Karnataka.

Competitions

A competition in Web Designing and Cipher Decoding was also conducted on the same day, as part of the CSI student convention. 23 teams took part in these competitions, each team comprised of two members. Mr Ankit S and Mr Arun Baby, RASET won the first prize in Cipher Decoding, whereas Mr Eldhose Peter and Mr Jayakrishnan, MACE, Kothamangalam won the second prize. Mr Amit Benjamin and Mr Delton B, RASET won the first prize in Web Designing competition and Mr Mahesh Mohan and Mr Bimal Raj, RASET bagged the second prize. The cash prizes and certificates for the winners and participants were handed out by the guest of the day Mr. Dorai Thodla, and Prof Kuttyamma A J.

Workshop Series

There was an online workshop on Mozilla conducted by Vishnu S, VIT on 13th March 2009. Also Vishnu S, Google Ambassador, VIT and Prinish V conducted an enthralling workshop on Google which attracted the student community a lot on 14th March 2009. About 66 students participated in the Mozilla workshop and 51 students attended the Google workshop. The participants were rewarded with certificates and gifts from Google.

ConfER 2009

The Second National Conference on Education and Research, ConfER2009 (13th and 14th of March, 2009), was inaugurated formally on 13th March, 2009 by Prof. K K Aggarwal, CSI President in the presence of Prof. H. R. Viswakarma, Chairman, CSI Division V and other dignitaries. The venue also saw the release of the proceedings of the ConfER2009 CD by Rev. Fr. Jose Alex CMI to Prof. Viswakarma. The audience was enlightened by the distinguished lectures of personalities from various organizations all over India. The invited speakers were Mr. Om Prakash Dua (Managing Director, Keltron), Mr. H.R. Viswakarma (Senior Professor, School of Computing Sciences, VIT), Prof Ritu Gupta (GGS Indraprastha Unty, New Delhi), Mr. Waman Javedkar (IS & IT Consultant, New Delhi) and Dr. Mrs. Baby (Professor, HOD, Dept. of Library & Information Science, Rajagiri School Of Social Science, Kalamaserry), Dr. K. Subramanian (Professor and Director Advanced Center for Informatics and Innovative Learning, IGNOU) Mr.S.N. Raghu Kumar (AIIMS, New Delhi), and Mr. Prince Joseph (NPOL). The audience witnessed selected 20 paper presentations by eminent personalities all over India.

Object Tracking- A Feature based approach

TRIPTI C, LECTURER , DCS

The visual motion analysis is a very challenging field. It is an important task as far as the security and surveillance are concerned. Target tracking is of great importance in the field of military and defence. Target tracking can be done by tracking the features.

The features in an image can be its edges, corners, color, texture etc. and can be calculated by taking the eigen value of the 2x2 gradient matrix. This eigen value contains the information about the feature. Then, these features of the image in a frame are mapped with the image features of the next frame by using Kanade Lucas Tomasi Algorithm. The feature locations of the first frame and the feature location i n the next consecutive images are also noted. Using these locations, it is possible to predict the future location of the features in the next frame by using a prediction algorithm.

Reference:

Alper Yilmaz, Omar Javed and Mubarak Shah," Objet Tracking: A survey", ACM Computing Surveys, Vol.38, No.4, Article 13, Publication Date: December 2006.

Madasu Hanmandlu, Shantaram Vasikarla, Vamsi Krishna Madasu, "Estimation of motion from a sequence of images using spherical projective geometry", Proceedings of the Information Technology: Computers and Communications (ITCC.03), 0-7695-1916-4/03 □2003 IEEE.

For example, if the object for tracking is an Aeroplane. The Fig. 1 shows the features detected from a frame and Fig 2. denotes the window tracking the object.

Fig.1 Features denoted by red spots

Fig. 2 Window tracking the object

HAPTICS : Engaging the sense of touch

NEETHU EDWIN, ASSOCIATE LECTURER , DCS

Haptics refers to sensing and manipulation through touch. The word comes from the Greek 'haptesthai', meaning 'to touch'. By using special input/output devices (joysticks, data gloves, or other devices), users can receive feedback from computer applications in the form of felt sensations in the hand or other parts of the body.

ARCHITECTURE OF HAPTIC FEEDBACK
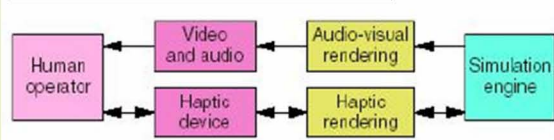
Virtual reality application incorporating visual, auditory, and haptic feedback

Simulation engine: Responsible for computing the virtual environment's behavior over time.

Visual, auditory, and haptic rendering algorithms: Compute the virtual environment's graphic, sound, and force responses toward the user.

Transducers: Convert visual, audio, and force signals from the computer into a form the operator can perceive.

Rendering: Process by which desired sensory stimuli are imposed on the user to convey information about a virtual haptic object

TYPES OF HAPTIC DEVICES

There are two main types of haptic devices:
Devices that allow users to touch and manipulate 3-dimensional virtual objects.
Devices that allow users to "feel" textures of 2-dimensional objects

Another distinction between haptic interface devices is their intrinsic mechanical behavior. Impedance haptic devices simulate mechanical impedance—they read position and send force. Admittance haptic devices simulate mechanical admittance—they read force and send position. Admittance-based devices are generally used for applications requiring high forces in a large workspace.

APPLICATIONS

Medical training applications: Such training systems use the Phantom's force display capabilities to let medical trainees experience and learn the complex physical interactions needed to become skillful in their art.

Teleoperations : Haptics devices are used in environment too hostile or too remote for humans.

Mobile Phones: Samsung has made a phone, which vibrates, differently for different callers. Motorola too has made haptic phones

Cars: For the past two model years, the BMW 7 series has contained the iDrive (based on Immersion Corp's technology), which uses a small wheel on the console to give haptic feedback so the driver can control the peripherals like stereo, heating, navigation system etc. through menus on a video screen.

FUTURE ENHANCEMENTS

Force Feedback Provided In Web Pages: This underlying technology automatically assigns *"generic touch sensations"* to common Web page objects, such as hyperlinks, buttons, and menus.

Haptic torch for the blind: The device, housed in a torch, detects the distance to objects, while a turning dial on which the user puts his thumb indicates the changing distance to an object. The pictured device was tested and found to be a useful tool.
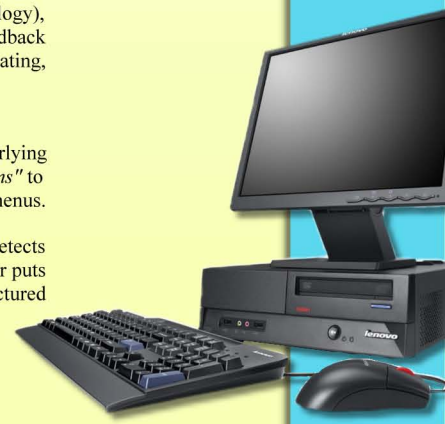
AIR TRAFFIC MANAGEMENT USING SOFT COMPUTING TECHNIQUES

DEEPTHI JOHN S8 CS

Introduction

The challenge of future Traffic Flow Management (TFM) is to organise complex air traffic flows through busy areas and minimise delay related problems in the advent of continued growth of air traffic and its complexity. To implement the process of maximizing airspace capacity we require robust and safe weather avoidance algorithms . The problem involves a number of potentially conflicting objectives such as optimizing fuel usage and customer comfort.When dealing with the dynamics of weather and air traffic operations, no two days are ever exactly the same. The goal is to generalize some events into similar "type" problems. Artificial Intelligence specifically Case Based Reasoning can play an important role in decision making for TFM problem resolution. The selection of an optimal path with collision avoidance from A to B can again be solved using a soft computing technique called the Hybrid Ant Colony Optimisation. The whole system can be deemed as a multi agent system.

Multi-Agent Systems

An agent is anything that can be viewed as perceiving its environment through sensors and acting upon that environment through effectors. A multi-agent system (MAS) is a system composed of multiple interacting intelligent agents. It is a collection of autonomous agents acting independently using only local information and with, possibly, the ability to communicate with each other.

The multi-agent path planning approach helps in planning the route for each agent individually, takes into account other agents movement. By modifying algorithms of path planning optimization can be achieved in an environment with obstacles.

Case-Based Reasoning

All case-based reasoning methods have in common the following process:

• Retrieve the most similar case (or cases) comparing the case to the library of past cases;
• Reuse the retrieved case to try to solve the current problem;
• Revise and adapt the proposed solution if necessary;
• Retain the final solution as part of a new case.

There are a variety of different methods for organising, retrieving, utilising and indexing the knowledge retained in past cases.

Retrieving a case starts with a (possibly partial) problem description and ends when a best matching case has been found. The subtasks involve:

• Identifying a set of relevant problem descriptors;
• Ratching the case and returning a set of sufficiently similar cases (given a similarity threshold of some kind); and
• Selecting the best case from the set of cases returned.

The CBR approach is proposed to capture experiences in dealing with these thunderstorm problems. Those experiences are then reviewed to support the decision making process while resolving a current thunderstorm problem of a similar nature. Through the course of this project, the focus was on problems with national traffic implications, as opposed to local implications.

CBR has many advantages over rule-based reasoning (RBR), but also admit that CBR must

Complemented with other systems such as RBR to build successful applications, including our application.

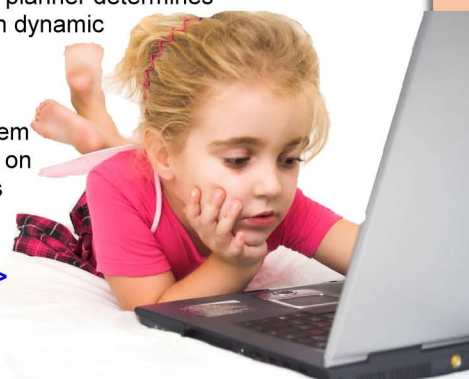### Hybrid Ant Colony Optimisation

Ant Colony Optimisation (ACO) is a paradigm for designing metaheuristic algorithms for combinatorial optimization problems. The main underlying idea, loosely inspired by the behavior of real ants, is that of a parallel search over several constructive computational threads based on local problem data and on a dynamic memory structure containing information on the quality of previously obtained result. The collective behavior emerging from the interaction of the different search threads has proved effective in solving combinatorial optimisation (CO) problems.

ACO is not effective in dynamic environment and it is used only for global approach. System uses a hybrid approach on ACO called Hybrid ACO. In this hybrid approach ACO is used as global path planner and Artificial Potential Field (APF) is used as local path planning algorithm. Local planner determines the navigation ability of system and obstacle avoidance in unknown environment or in dynamic environment.

Conclusion

Soft Computing techniques can be together applied in a useful way for TFM problem resolution. This paper describes a particular class of decision making that relies on past experiences, and how this applies to the TFM domain and also how the routes for the flight can be optimised based on factors such as weather, fuel efficiency, traffic density using Hybrid Ant Colony Optimisation and Multi-agent Systems

References

[1] Hao Mei, Yantao Tian, Linan Zu, School of Communication Engineering, Jilin University, Changchun, 130025, China, 2005," A Hybrid Ant Colony Optimization Algorithm for Path Planning of Robot in Dynamic Environment1"

[2] Sameer Alam, Hussein A. Abbass and Michael Barlow School of Information Technology and Electrical Engineering University of New South Wales, 2006, "Multi-objective Ant Colony Optimization for Weather Avoidance in a Free Flight Environment".

VIRTUALIZATION

Alwyn Aby Kuriakose S6 CS

Virtualization is an approach to deploy computing resources that isolates different l ayers—hardware, software, data, networks, storage—from each other. By doing so, virtualization makes it easier to implement changes. The result is simplified management, more efficient use of IT resources, and the flexibility to provide the right computing resources, when and where they are needed.

There are various types of virtualization methods.

Machine virtualization uses software to create a virtual machine that emulates the services and capabilities of the underlying hardware, making it possible to run more than one operating system on a single machine.

Application virtualization separates the application from the operating system thus reducing conflicts between applications, which can simplify deployments and upgrades.

Presentation virtualization enables an application on a computer in one location to be controlled by a computer in another.

Despite the fact that virtualization has been around for many years, industry analysts estimate that fewer than 10 percent of servers are virtualized today. But its significance is growing as companies have introduced products that target today's high-volume, low-cost hardware.

But saving money is just the beginning of the value that virtualization offers. By separating the layers of the computing stack, a virtualized IT environment makes it possible to quickly deploy new capabilities without having to configure components more efficient use of resource. On the desktop, application virtualization reduces management costs. And when the operating system, applications, data, and user preferences are all virtualized, it makes it possible for users to access the computing resources they need anywhere and from any machine. The result is tremendous flexibility for employees and greater efficiency and agility for IT departments, everywhere.

Source: http://www.microsoft.com/mscorp/execmail/2008/01-21virtualization.mspx

RRCC

The RRCC groups under CS Department are striving to take up new and innovative projects to keep up with the current trends of IT and for the upliftment of the student community.The groups are

1.Networking
2.Artificial Intelligence
3.Database and Data mining
4.Soft Computing
5.Computational Fluid Dynamics