

A hundred innovations from the University of Moratuwa

by a special correspondent

Innovations UOM 2005 organised by the University of Moratuwa is an event that would showcase the latest cutting edge innovations of the university. The University of Moratuwa consists of three faculties; Information Technology, Architecture and Engineering. It is to be held from September 16 to 18 at the Conference Wing of the BMICH.

The innovations of this exhibition are related to industry applications, consumer foods, social aspects, health and sports, defence, agriculture, Information Technology, Medicine, fashion and creative designs. These innovations could be a step in the right direction towards national development and make a positive impact in terms of economic and social benefits. A majority of the exhibits are from the ten departments of the Faculty of Engineering.

From the Department of Chemical and Process Engineering are major developments in the fields of agriculture, food technology, process technology and environmental protection. Among these is a novel process for the production of Rice Bran Oil which is seeing a rise in demand due to its immense health benefits.

These include the reduction of cholesterol and oxidative stability which make it less prone to going rancid. Supervised by Dr. Padma Amarasinghe and developed by Nalin Gangodavilage and Mangala Kumarasiri. This new technique uses a combination of leaching, solvent extraction and boiling to extract the oil from the rice bran. The pilot plant developed at a very low cost shows highly promising results hinting its feasibility at a larger scale.

It is known that a high proportion of the vegetable produce of Sri Lanka gets wasted due to improper packing and preservation methods. This is why a scheme to produce soup from dried vegetables developed by H.I. De Silva under the supervision of Dr. Sanja Gunawardena would benefit the farmer in terms of reduced harvest losses as well as the consumer in terms of a healthy all natural meal. The other innovations in agriculture and food technology include a Reverse Flow Cyclone method to separate tea dust from fluidized bed tea dryers, a new completely non-alcoholic drink produced from rice and a new development for instant coffee.

In the face of rising petroleum prices, research into alternative fuels has become a top priority, especially for developing nations that spend a huge amount of their foreign exchange for petroleum and petroleum based products such as fertilizer. Among the projects related to alternative fuel is a project supervised by Dr. Ajith de Alwis and undertaken by K.S. Vishvajith, C.S.K. Peramune and K.S. Wijewickrama, which looks into the production of "bio-diesel" from Sunflowers. Also on showcase is the prototype of a household biogas cylinder. This ambitious project is supervised by Missaka Hettiarachchi and developed by P.S.C.S. Jayarathne, H.P.K. Udana and W.M.D.R. Warnasooriya. The goal is to someday, be able to provide a

viable alternative to the domestic LP gas cylinder.

Numerous prototypes of processes for a cleaner environment are also among the exhibits from this department. These include a sand filter for tannery waste water treatment and a portable urine filter for temporary sanitation facilities.

There are also two information systems for solid waste management named BEST City and for tracking hazardous chemicals within Sri Lanka known as HazNet. Also featured is a low cost repairing method for GRP boats supervised by Dr. Olga Gunapala.

The main innovation from the Department of Textile and Clothing Technology is the Somutt's Bed Sheet for Asthma. It was developed by Charith Samaranayake, Suwani Perera, Kamal Priyankara, Tharindu Ranasinghe, Harsha Perera and Pavithra Srichandrabalan under the supervision of N.G.H. De Silva. Asthma is the most widespread allergy in the world and is caused mainly by bed mites and pollen. The bed sheet has a special structure that prevents bed mites from proliferating by using a barrier metallic layer in between. This prevents the mites from freely moving across the bed sheet and deprives them of the opportunity to breed close to the mattress and feed on dead skin at the surface. It also provides extra comfort by removing sweat from the body. The department is eager to find an investor to develop and market this product.

Exhibits from the Department of Computer Science and Engineering include software developed by the students for the industry. Among these is a software used for Automatic Number Identification (ANI). This was designed and developed by S. Koneswaran, M. Regan and K. Thavachelvan and supervised by Shantha Fernando and Thilak De Silva. This software uses image processing to identify the numbers on vehicle licence plates. Also on display is a similar software which is used to automatically identify the numbers of cargo containers. This would make logistical operations in ports and cargo depots.

The Virtual Facial Surgery Diagnosis software was developed under the supervision of Dr. Chaturade Silva for Surgeon Dr. Harsha de Silva. Facial surgery is a delicate operation which is often done to correct birth defects, trauma victims and for cosmetic surgery. Since the face has a number of sensitive organs which cannot tolerate a fault by part of the surgeon, pre planning is often essential. This software constructs and exact 3D model of the patient's face and allows virtual manipulation of the patient. By rehearsing the surgery on a computer, it is possible for the surgeon to explore all the options prior to the surgery without any

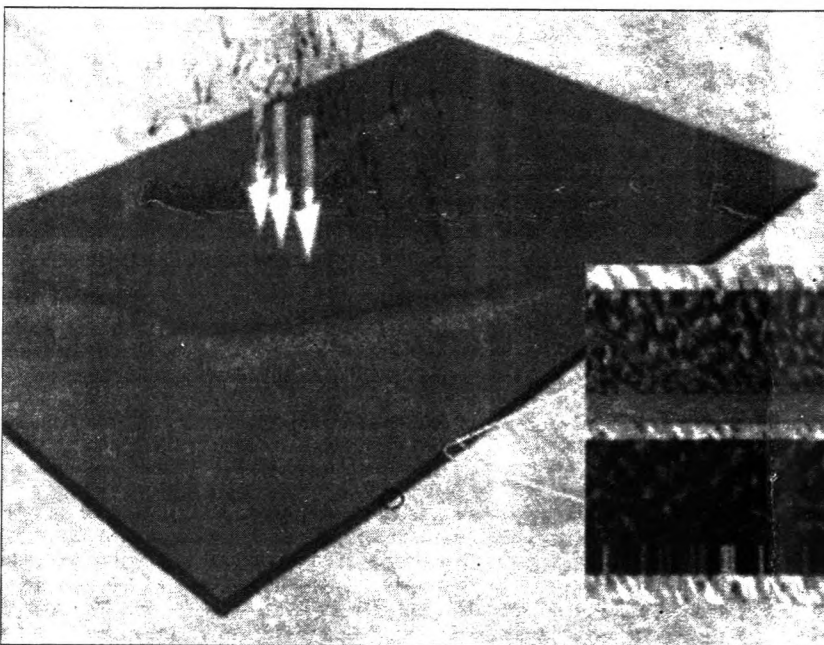
risk of failure. This enables the surgeon to come up with an effective contingency plan for the surgery which when done for real does not offer a second chance.

In the field of robotics is one of the key exhibits of the event, Murali. Murali is the first ever legged robot to be developed in Sri Lanka. The result of a long term project developed by numerous teams under the patronage of Dr. Thirishantha Nanayakkara of the Department of Mechanical Engineering. Dr. Nanayakkara is also a Deputy Commissioner of the Sri Lanka Inventors Commission. Murali is a legged robot which uses what is known as a layered architecture to seek out landmines.

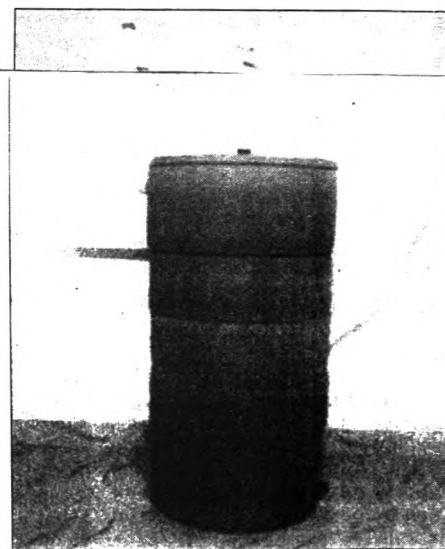
In layered architecture, the decision making of the robot is handled by different layers where the higher layers take charge of more decision oriented tasks such as identifying a landmine while the lower layers handle more primitive behaviours such as avoiding an obstacle such as a rock. The robot is built and moves much like a monitor lizard (iguana) and its overall weight is less than 7kg which is the minimum weight required to set off most types of landmines. Murali is destined to be a saver of lives and a saviour in returning normalcy to civilian life in the North and East of Sri Lanka.

Dr. Nanayakkara also supervises the development of a demining manipulator with Dr. Palitha Dasanayaka which is intended to be able to dig out and remove landmines without causing damage to the machine or nearby humans. This machine was designed and developed by mechanical engineering undergraduates H.P.L. Pushpakumara, G.V.A.C. Pradeep and S.W.M.S.R. Ariyawansa.

From the same department is a new machine which is capable of separating garbage into its basic components. This is supervised by Dr. Mervin Fernando who recently won a presidential award for his



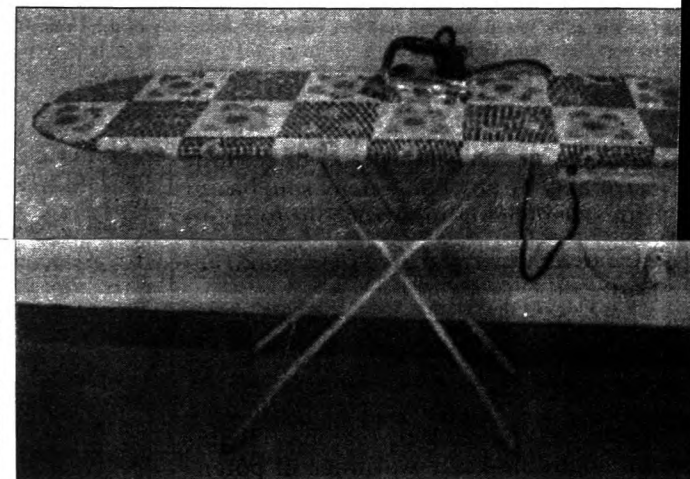
Bed sheet that curbs asthma



Portable urine filter



Murali: Moratuwa University Robot for anti-landmine intelligence



Intelligent ironing board

is also not practical to have the same human bowler bowl for many hours because it would most likely cause injury, especially for fast bowlers.

This is what inspired the development of the cricket bowling machine under the patronage of Dr. Rohitha Weerasinghe. It was built by G.H.T.S. Abeysinghe, J.C.M. Arachchi, R.M. Ariyamanjula and S.R. Wanasinghe. The target is to develop such a machine to emulate the various bowling styles and speeds of different bowlers using an actual leather cricket ball. The Table Tennis Robot is a similar project intended to simulate the playing style of various international players in order to increase the competitive edge of Sri Lankan players during international competitions.

Among the projects from the Department of Electronics and Telecommunication Engineering, are projects related to mobile telecommunication system deployment, monitoring and utilisation. In mobile communication industry field measurements are often carried out in network optimization, troubleshooting and in commissioning of new sites.

These measurements include received signal strength, receiving base station ID (Cell ID), signal strengths from neighbouring cells, frequencies used, frequency hopping and many other parameters. This project supervised by Dr. Ernest Kulasekara and developed by P.S. Halpadeniya, C.J. Wijayawardhana and M.S.S. Wijetunge. It involves the real time collection and report generation of the status of the cellular network.

The Architecture Faculty, design students have participated in this

event with designs in fashion, jewellery, furniture and ceramics. Among the designs are the re-organizing of Sri Lankan kitchen by Ms. Rangika Basnayake, a mobile cafe based on a modified three-wheeler by Ms. Anjalee Ranasinghe, posture based seating designs and accessories for primary schoolchildren by Nirmal Rathnayake, a furniture design for a visitors lounge at Minneriya by Ruwan Gunaruwan, a tableware set out of red clay by Ms. S.M.P. Ayesha Thushari and a spice container set design by Ms. A. Kobbekaduwa.

It must be mentioned that the Vice Chancellor of the University of Moratuwa, Prof. Dayantha S. Wijeyesekera was instrumental in making most of the projects a success by procuring funds, especially for the post graduate projects. In addition Prof. Wijeyesekera has been a key figure in bridging the industry with the university which has undoubtedly enabled the University of Moratuwa maintain a high standard of research. An outstanding product of the University of Moratuwa, he has been serving as the Vice Chancellor for the past six years. Last but not least is the support and enthusiastic encouragement provided by veteran inventor Vidya Jyothi Dr. Ray Wijewardane, the honourable Chancellor of the university.

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