



Research & Innovation Newsletter

Publication of the Graduate Studies and Research Office

Issue 4

March 2011

UNIVERSITI Brunei Darussalam held the inaugural meeting of the Governing Board of the International Consortium of Universities for the Study of Biodiversity and the Environment (iCUBE) on 28 January 2011. The meeting took place at the Kuala Belalong Field Studies Centre in Temburong. Items discussed include iCUBE work programme for the coming two years, such as planning for workshops, international conferences, joint research projects, student and staff exchange programmes and internship programmes for graduate students. The governing board members of iCUBE are made up of vice chancellors and presidents of consortium members from eight universities, viz., King's College of London, Korea University, Monash University, National University of Singapore, University of Auckland, University of Bonn, University of North Carolina and UBD.

The establishment of the consortium was made official on 29 January 2011 in a ceremony held at the Core, New Residential College at UBD. It was officiated by the Minister of Development Pehin Orang Kaya Indera Pahlawan Dato Seri Setia Hj Suyoi Hj Osman.

A signing agreement between researchers and UBD for the Science and Technology fund was held on 7 February 2011. It was witnessed by the Vice Chancellor, Dr Hj Zulkarnain Bin Hj Hanafi and other senior officers and staff of UBD. The total grant approved for round 2 of the S&T fund for 15 research projects was B\$18.95M.

The Science and Technology fund round 1 tentatively comes to an end in Mid March 2011. The Lifecycle of the perennating dodder (*Cuscuta*) in Brunei Darussalam is one of the plants studied in this round 1 of the S&T funding.



Graduate Studies Matters

New Graduate Programmes

Universiti Brunei Darussalam invites suitable applicants for enrollment into the graduate programmes leading to Masters and Doctoral degrees for two intakes every year, that is, January and August. The closing date for August 2011 intake is 31 March 2011.

Graduate Research Scholarship Scheme

We encourage staff to actively recruit students to apply for the Graduate Research Scholarship.

The Scholarship is introduced to facilitate and promote research degrees in order to develop the University into a research-intensive university, and also to expand and enhance the quality of graduate programmes and graduates.

It is open to ALL candidates on competitive basis. To be eligible, a candidate must be:

- o Below 40 years old;
- o Enroll full-time in a *graduate degree by research (PhD or Master by Research degrees)* (outstanding students applying for Master by Coursework may be considered); and
- o Demonstrate a good academic track record.

The Graduate Research Scholarship includes:

- o Allowance of B\$1,500 per month (Maximum period of 2 years for Master by research and 3 years for PhD programme) with tuition fees waiver.
- o Passage to Brunei Darussalam, from and back to home country for overseas candidates.
- o Allowances for field research:
 - o B\$2,000.00 for Master by Research candidate.
 - o B\$3,000.00 for PhD candidate.

Candidates applying to enter Graduate Programmes by Research are encouraged

to apply.

E-mail enquiries can be sent to:
office.psr@ubd.edu.bn

Innovation and Enterprise Office (IEO)

The IEO is set-up to assist researchers wishing to apply for a possible patent and other related IP matters. Researchers can write either to the Dean of GRC or AVC (**New Initiatives and Innovation**) stating what is novel, utility (usefulness) and non-obvious (inventive step) in their claim(s). The University have fund to file for patent locally and overseas.

Researchers are remained not to disclose their invention or research in whatever form before they have taken the necessary action to protect their invention or research.

For query about IP matters, please contact the Patent Documentation and Information Unit Officer,

Hjh Haneen Bte DP Hj. Ishaq at
haneen.ishaaq@ubd.edu.bn

A talk on IP was given by Dr Ramakrishna Damodharan, Director of Patents Division at the Malaysian KASS Sdn Bhd on 7 February 2011. He stressed the importance of protecting patents during his presentation. He stressed that "Without protecting intellectual property rights, there are no rights to stop others using the invention, innovation or industrial design. This means all risks and costs such as years of research and development costs, initial market introduction costs and regulatory approval expenditure will be lost". He said the biggest challenge for patent applicants generally is the time it takes to patent the product. This is not due to the lack of patent certifying offices, however, as most countries in Asia and worldwide have their own patent office and examiners, he said. He added that patents for Brunei granted in Malaysia, Singapore or the United Kingdom can be re-registered to be enforceable here and they are valid in Brunei as long as the parent patent is still valid and enforceable.

Dr Ramanakrishna has been involved in the field of intellectual property for over nine years, specialising in the drafting of patent specifications and issuing freedom to operate opinions for various inventions, particularly, pharmaceutical inventions.

During his presentation, he also focused on exclusive rights to new technology such as improvements to existing products, process and method of manufacture, and new non-obvious use of known products (mainly chemical products).

Research Projects Approval

At the last meeting of URC (Business) on 26 January 2011, the following research projects were approved **subject to amendments**:

1. Dr Tan Kha Sheng and team, Faculty of Science.

An integrated ultrasonic sensor for pipe wall thickness monitoring and evaluation.

2. Dr Abby Tan Chee Hong, Faculty of Science.

Studies of Brunei Healthcare Insurance Claim.

3. Dr David Young and Dr Tan Ai Ling, Faculty of Science.

Green Technology: Organometallic Emitters from Natural Products.

4. Dr Norhayati Hj Ahmad, Faculty of Science.

Determine pancreatic islet regenerative capacity in response to *Nigella sativa* and its active component Thymoquinone.

5. Dr Piyasari Ekanayake and team, Faculty of Science.

Synthesis and Characterization of Polymer Electrolytes for applications in Low Cost Solar Cells, Li Batteries and Electrochromic Displays.

6. Dr Lim Lee Hoon, Faculty of Science.

Determination of Volatile Organic Compounds in occupational environments.

7. Dr Tayyab Hasan and Hj Salmah Bte Mohd Noor, IHS, Medicine.

Development, implementation and evaluation of communication skill curriculum in interprofessional setting.

8. Dr Md Mahmud Hasan, Faculty of Science.

Green power for Mobile: Off-grid charging solution for mobile phones.

9. Dr Franz L. Wimmer, Faculty of Science.

A new method for the preparation of Homoleptic Metal(II) Acetylacetonato Complexes-Phase II.

10. Dr Adrian Clynes, Faculty of Arts and Social sciences.

The Tutong Digital Dictionary Project.

The next meeting to consider research proposals by URC (Business) is tentatively scheduled for mid April 2011. Staff can submit their research proposals to the Office of Dean of GSR through their respective Dean.

Science and Technology Research Fund Matters

The following projects were approved for round 2 of the S&T fund:

1. AP Dr David Lane and team.

Studies of the diversity, distribution, bioacoustics and ecomorphology of bats (Chiroptera), a major, highly diverse, but understudied group of mammals in Brunei Darussalam.

B\$ 515,222.40

2. Dr Joseph K. Charles and team.

The status and distribution of endangered cats and other wildlife in dipterocarp forests of Brunei Darussalam.

B\$447,437.20

3. AP Dr Ulmar Grafe and team.

Diversity and distribution of parasitic flies in Brunei Darussalam with implications for human health.
B\$ 394,102.80

4. AP Dr David Lane and team
Scleractinian coral diversity, reproduction, growth processes and reef accretion in relation to ocean and coastal regimes in Bruneian waters.
B\$ 586,390.00

5. Dr Hj Dulima Jali and team.
Rehabilitation of degraded peat swamp.
B\$ 449,400.00

6. AP Dr David Marshall and team.
Chemical Ecology of the Brunei Estuarine System: Consequences of Eutrophication, acidification and pollution.
B\$ 578,984.00

7. Dr Lim Chee Ming and team.
Energy programme.
B\$ 13,844,544.00

8. Dr Cheong Poh Ai and team.
Promoting Understanding of Science Concepts with Professional Development of Science Teachers.
B\$ 180,460.00

9. Professor Dr Victor Didenko and team.
Convolution-Like Operators. Properties, Approximation, Applications.
B\$ 303,870.00

10. Syamimi Ariff and team.
An Evaluation of Webcasting Effectiveness as a Marketing Medium in Institutes of Higher Education (IHE): Universiti Brunei Darussalam as a Case Study.
B\$ 252,817.60

11. Dr William John Duane and team.
Investigation of the rates of coastal erosion at Berakas.
B\$ 83,314.00

12. Dr Alistair Wood and team.
Public Understanding of Science in Brunei Darussalam.
B\$ 74,957.12

13. Dr Romaizah Hj Mohd Salleh.
Preparedness of Lower Secondary Science Teachers to Meet the Demands of SPN21.
B\$ 153,048.00

14. Professor Harkirat S Dhindsa and team.
Empowering Primary Teachers' Science teaching Competency to Improve Scientific and Technological Development in Brunei Darussalam.
B\$ 53,991.00

15. Dr Mohd Ayub Sadiq @ Lin Naing and team.
Survival of Primary Lung Cancer Patients Treated in Brunei Darussalam
B\$ 48,974.80

Research Activities

In this issue we highlight some innovations in a model smart home.

Multiple Sensor Based Autonomous Monitoring and Control for Energy Efficiency

Researchers: Liyanage C De Silva and Iskandar Petra

We are living in a world full of electronic appliances, computers and you name it. When we get into our car we will see a multitude of displays to indicate the amount of petrol left in the tank, engine temperature and many more. Did you ever wonder why none of our modern homes have any such displays even just to tell how much our energy consumption is? Did you ever wonder why we cannot tell how many air conditioners are on at a given time in the house and how many are running in rooms without any occupants. In our smart home we provide an innovative solution to this problem. Initially, a smart home based on wired

technology is designed and implemented for energy efficiency. The system we have designed consists of multiple sensors such as motion sensors, pressure sensors, temperature sensors etc to monitor the activities of the occupants in the home and also monitor the environmental conditions of the home so that it can act accordingly.

Figure 1 shows the GUI (Graphical User Interface) of our centralized multiple sensor based platform. Sensors such as motion sensors, distance measuring sensors, pressure sensors were used to control lightings, monitor the presence of occupants inside a room to control the air-conditioning etc. Figure 2 shows the initial prototype implementation of the multiple sensor control arrangement used in the project.

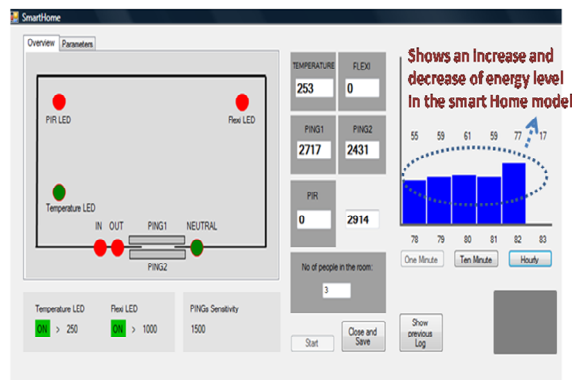


Fig. 1. The GUI that used to monitor the energy efficiency and status of the sensors.

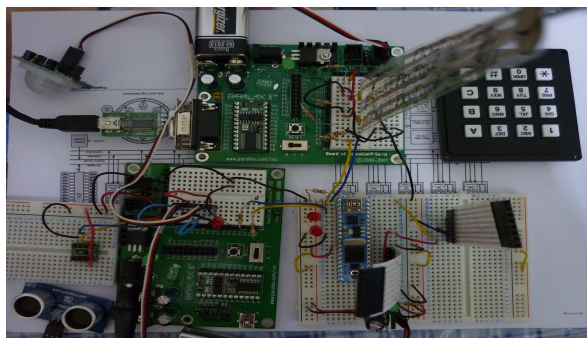


Fig. 2. Initial prototype implementation of the multiple sensor control arrangement.

Air conditioner is one of the equipment that contributes to high energy consumptions. In our smart home, we used pressure sensors in order to improve the energy efficiency as well as giving

comfort by detecting the presence of the occupants in any area in the house. Pressure sensors can provide the best solution to detect the exact location of people: for example while a person is sleeping or sitting in one place.

In our smart home, the pressure sensors are placed under the carpet to detect the pressure exerted on it. Whenever there is pressure exerted over the carpet, it will change the resistance of the sensor and the microcontroller can locate the position of the person in order to switch on the air conditioner and fans and direct cool air on to the occupant by reducing unnecessary cooling of the whole room. Figure 3 shows the pressure sensor under the carpet that is used to control the operation of the air-conditioner.

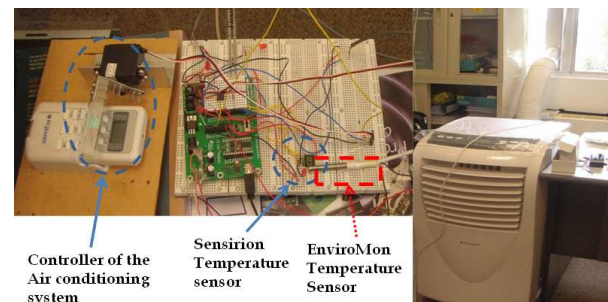


Fig. 3. Pressure sensor under the carpet used to control the operation of the air-conditioner.

Similar to pressure sensors, in our smart home, we have used multitude of other sensors, such as ultrasound based distance measuring sensors called PING sensors, infrared based pyroelectric sensors called PIR sensors, temperature sensors etc. to detect human activities and environment conditions to centrally monitor and control the energy consumption.

Figure 4 shows our prototype implementation of the smart home system with multiple sensors to monitor and control the home environment. We have demonstrated that smart home system can be a fully autonomous system which can support the energy efficiency in residential and industrial premises with some features such as RFID for security and eldercare.

Here we have presented our work on multiple sensor based environment monitoring and its applications in energy efficiency. Using pressure sensors, temperature sensors, distance measuring sensors (PING) and motion sensors (PIR) we were able to show how the smart homes lighting and air-conditioning systems are monitored and controlled. Using a sample scenario we showed that the energy consumption in a smart home can be reduced by up to 30% whereby reducing the carbon footprint of an average home owner.

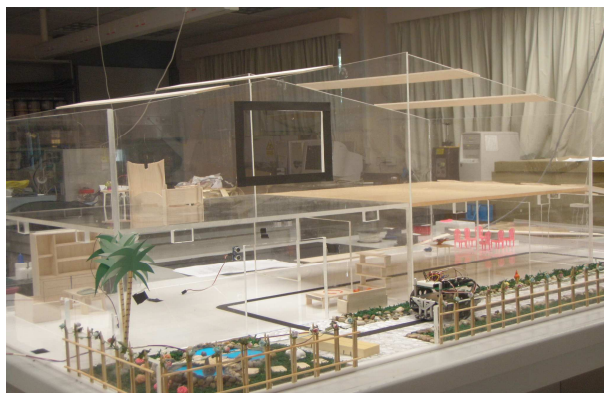


Fig. 4. The Prototype Smart Home System at UBD laboratory with multiple sensors.

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UBD Talk Time

If you would like to give a talk in Talk Time, you are most welcome. Please contact the Dean, GSR or email: office.psr@ubd.edu.bn

Visiting academic schemes

There are now available visiting professorships, adjunct professorships, adjunct associate professorships and adjunct lecturers schemes. These are equivalent to other reputable university schemes.

Further information can be obtained from the dean of your faculty or UBD website.

Research Group/Clusters

The following staff has been appointed to lead in the following research group/cluster initiatives.

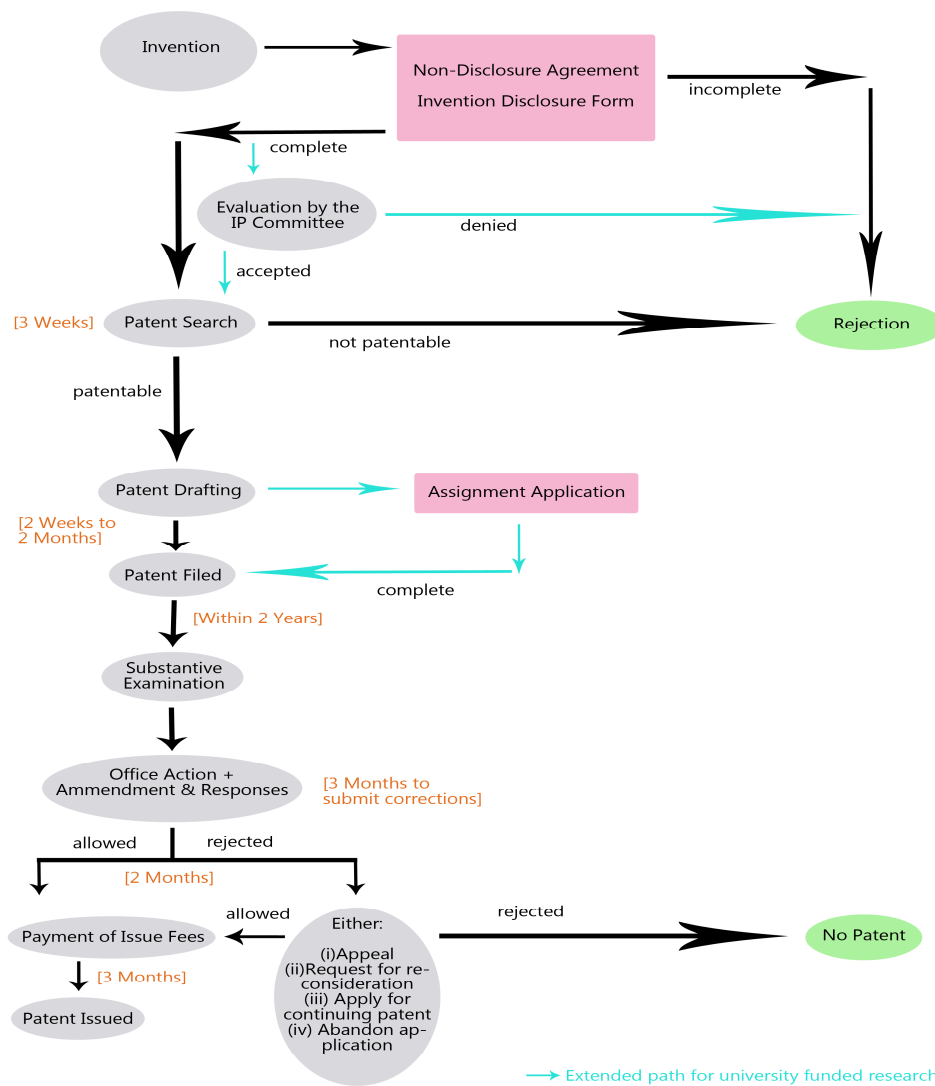
Research	Cluster Leaders
Energy Group	Dr Lim Chee Ming cheeming.lim@ubd.edu.bn
Materials Cluster	A/P Dr Peter Hing peter.ng@ubd.edu.bn
Modelling and Simulation Cluster	Dr Saiful Azmi Hj Husain saiful.husain@ubd.edu.bn
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Cancer Cluster	Prof Mohd Mabruk mohamed.mabruk@ubd.edu.bn
Islamic Studies Cluster	Dr Hj Ibrahim bin Hj Abd Rahman ibrahim.rahman@ubd.edu.bn
Youth Cluster	Dr Dk Norulazidah bte Pg Hj Omar Ali norulazidah.omar@ubd.edu.bn

If you are interested to contribute to any of the group/cluster, please feel free to contact the respective leader.



Patent Process Flowchart



Non-Disclosure Agreement:
This agreement is used to protect confidential information from being divulged to outside persons without mutual consent from the concerned parties.

Invention Disclosure Form:
This form is used to evaluate the invention for patentability.

IP Committee will consist of:
AVC (NII)
IEO Director
Dean of Graduate Studies and Research
The University's legal representative(s) or attorneys
Business experts
One or two scientists or research experts in the relevant field.

For an invention to be patentable, it has to be:
(i) Novel; the invention has to be new and unknown to the public.
(ii) Useful; the invention should be capable of doing something
(iii) Non-obvious; the invention should not be obvious to a person of 'ordinary skill' within the field.
A Patent Search may be conducted by a patent agent.

Patent Drafting:
It is important to have a well-kept record of notes relating to the conception of the invention as they are required for the patent drafting process. The length of time it takes depends on the complexity of the patent.

Assignment Agreement:
This agreement is a contract which assigns right of the patent from the inventor to the University, of which the distribution of revenue has been pre-approved.

Substantive Examination:
Further patent search conducted by the patent examiner.

Office Action:
The patent examiner may cite 'prior art' (i.e. existing inventions). At this point, action is to be taken to convince them that the invention is patentable.

Maintenance Fees:
After a patent is issued, maintenance fees have to be paid to keep the patent enforced. These fees differ according to the country where the patent was filed.

Updated 15th December 2010