USP
THE UNIVERSITY OF THE SOUTH PACIFIC

FACULTY OF SCIENCE, TECHNOLOGY AND ENVIRONMENT

Yumehotaru – A Technological & Cultural Exchange Programme between USP and Taketoyo-Cho, Aichi Prefecture, JAPAN

Lego Robotic Competition & Wind Energy Contest 2011

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Yumehotaru Lego Robotic Competition 2011

The 2011 Yumehotaru Lego Robotic Competition was a collaborative robotic competition between the Japanese and Fijian school students, coordinated by Robotics and Automation Group (RAG) at USP. LEGOTM Mindstorms robot kits were used to construct robots to follow a defined path and remove obstacles from its path. The LEGOTM Mindstorms robot kits are independent building tool that combine the versatility of the LEGO building system with an intelligent microcomputer brick and intuitive drag-and-drop programming software to help create a robot in 30 minutes. Students explore various aspects of control engineering relatively quickly, easily and without any additional equipment other than a computer for programming.

The 2011 Yumehotaru Lego Robotic Competition was divided into two categories; Domestic and International competition. The Domestic Competition was held from the 1 - 3 December, 2010 where D.A.V College of Suva won this contest. In the International competition, Suva Muslim College and Marist Brothers High School students were also invited to join D.A.V College students to form four mixed teams, from which Alex Naidu's (from D.A.V College of Suva) team along with Big Pine (Japanese Team) won the first prize. The International Competition between the Japanese teams and local teams was coordinated in real time using SKYPE technology and was hosted at the newly built state-of-the art Japan-Pacific ICT Center at USP on 12 March, 2011. This contest was made possible by funding from the Association of **Taketoyo Cultural Creation** in Japan.

Ashneel Maharaj (D.A.V College, Suva) with students from Marist Brothers High School during the International Lego Robot Competition.

Students' creation under test for the Yumehotaru Wind Energy Contest 2011.

Yumehotaru Wind Energy Contest 2011

Twelve students from two prominent Suva schools participated in the 2011 Yumehotaru Wind Energy Contest that was held in the Fluids Engineering lab at the School of Engineering and Physics at USP on 12 March, 2011. The event was an important one as it allowed students to understand and appreciate the technology behind wind energy. Knowledge on renewable energy must be imparted to our younger generation to enable them to use this clean source of energy in future. Wind Energy is a pollution free and natural source of energy that is endless in supply and available free of cost to us. You may just feel the wind blowing around right now! In the olden days wind-mills were used to grind flour or even pump water. Some wind driven water pumps are active even today!! But perhaps the most common use of wind energy is for electricity generation. There are two basic types of Wind Turbines; Vertical Axis wind turbines (VAWT) and Horizontal Axis wind turbine (HAWT). As the name suggests, the axis in HAWT turbine is horizontal. HAWTs are more efficient than VAWTs but they are more expensive and complex to make. The HAWTs rely on specially designed blades to cause rotation. The blade rotation is caused by "lift" on its airfoil section. VAWTs are much easier to build than HAWTs and do not require very tall towers. But they are less efficient and provide less power than HAWTs.

The students were asked to design and construct their turbine blades from locally available materials. The students' home-made blades were mounted on a turbine hub for testing. With the help of the state of art wind tunnel housed in the Fluids Engineering lab, high speed air was blown onto the turbine blades which caused the blades to rotate. The event was an exciting one for the sixth and seventh formers. To their delight their blades were good enough to light up a small light bulb. Suva Muslim College scooped the first prize of $300 while Marist Brothers High School settled for second place with $200. Teachers and students commended the competition and promised to return for more in the future. Students not only walked away with cash awards but also took vital knowledge about renewable energy technology. This contest was made possible by funding from Association of **Taketoyo Cultural Creation** in Japan.

Robotics and Automation Group (RAG)

RAG is a research and development group within the School of Engineering and Physics (SEP) at the University of the South Pacific (USP) which was established in 2002. RAG has been coordinating and representing the USP region in the annual Asia-Pacific Broadcasting Union Robot Contest (ABU Robocon) competition since 2002 and has also been coordinating an environmental awareness project called "Yumehotaru" since 2007 in conjunction with the Association of Taketoyo Cultural Creation which is a non profitable organisation (NPO) based in Aichi Prefecture in Japan.

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