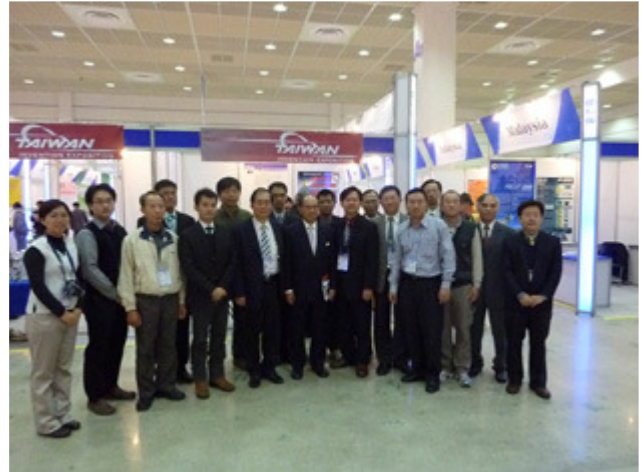


National Cheng Kung University (NCKU) Students Won One Gold Medal and Two Special Awards in 2009 Seoul International Invention Fair (SIIF) NCKU Press Center

[December 17th, 2009, Tainan, Taiwan]

Three students from a cross-disciplinary research team at National Cheng Kung University (NCKU), Tainan, Taiwan, won a gold medal and two special awards from the Association Russian House for International Scientific and Technological Cooperation and International Festival of Innovation, Knowledge and Creations in 2009 Seoul International Invention Fair (SIIF). The award winning invention, the Motioned Space Spirits with Green Technology, is a multi-functional and solar powered modular robot for the LOHAS (lifestyles of health and sustainability) era. Academician Michael Ming-Chiao Lai (賴明詔), President of NCKU, received Po-Wei Chen (陳柏維) from Master's program of Institute of Nanotechnology and Microsystems Engineering, Cheng-An Pan (潘晨安) from Ph.D. program of Department of Architecture, and Lien-Kai Chang (張廉楷) from Ph.D. program of Department of Mechanical Engineering and lauded their exceptional accomplishment.

Taking creativity and cross-disciplinary research as NCKU's main missions, President Lai was pleased with this achievement. He encouraged the students to keep on innovating and transform NCKU to a heaven of innovation and cross-disciplinary collaboration.



The Taiwan delegation to the 2009 Seoul International Invention Fair collected 15 gold medals, 15 silver, 5 bronze, and 7 special awards.



Po-Wei Chen (right), Captain of NCKU team, received the special award from the Association Russian House for International Scientific and Technological Cooperation.

With pride: NCKU Team won the special award from the Association Russian House for International Scientific and Technological Cooperation (from left to right: Cheng-An Pan, Po-Wei Chen, and Lien-Kai Chang)

Po-Wei Chen said that entering this competition marked a milestone for their research, and apart from showcasing NCKU's innovation and R & D capacity in this esteemed international platform, they also broadened their horizon through this experience.

The SIIF 2009 was held from December 3–7 in the COEX Convention & Exhibition Center, Seoul, Korea. Thirty countries entered nearly 500 inventions in the fair. Inventors and enterprises competed in eight fields, including Machinery/Metal, Electricity/Electronics, and Everyday Living. This Motioned Space Spirits with Green Technology also attracted Prof. Ju-Hyung Lee, President of Korea University Invention Association. He invited this invention to be exhibited in the Future Smart Home Exhibition Hall in Seoul for a year, and was interested in further collaborations. Taiwanese Ambassador to Seoul, Chen Young-Cho (陳永綽), also came to encourage the team.



Po-Wei Chen (left) and Lien-Kai Chang (right) with the gold medal

Members of the NCKU cross-disciplinary R & D team include Prof. Mi-Ching Tsai (蔡明祺), Department of Mechanical Engineering, Prof. Kuo-Shen Chen (陳國聲), Department of Mechanical Engineering and Institute of Nanotechnology and Microsystems Engineering, Assoc. Prof. Tay-Sheng Jeng (鄭泰昇), Department of Architecture, Prof. Tien-Chi Chen (陳添智), Department of Architecture, Dr. Wu-Sung Yao (姚武松), Lien-Kai Chang, Ph.D student, Department of Mechanical Engineering, Po-Wei Chen, Master's degree student, Institute of Nanotechnology and Microsystems Engineering, Cheng-An Pan, Ph.D. student, Department of Architecture, and Pon-Loon Chen (陳鵬倫), Master's degree student, Department of Engineering Science.



Po-Wei Chen, Captain of NCKU Team, received the special award from the Association Russian House for International Scientific and Technological Cooperation in the Award Ceremony.



Po-Wei Chen, Captain of NCKU Team, received the special award of International Festival of Innovation, Knowledge and Creations

Inspired by the green architecture concept and in accordance with Taiwan's technology development policy, the Motioned Space Spirits with Green Technology can revitalize buildings with its kinetic, photosynthetic, and ventilating features.

Assoc. Prof. Tay-Sheng Jeng and Cheng-An Pan conceived the idea and the whole scenario of smart green architecture, and then the concept was materialized by Lien-Kai Chang, Pon-Loon Chen and Po-Wei Chen.

The smart robot is embedded with self-designed driving circuits, piezoelectric actuator, digital signal processing circuit and a position control system. Wirelessly controlled through its radio communication apparatus, it can be directed to move inside and outside the house. Light sensors are also installed to keep the two solar power panels always vertical to sunlight to maximize their efficiency. A rechargeable battery module is also embedded.

The kinetic green robot, with its modern technologies, can turn the rigid traditional architectures into interactive ones.

About the size of an adult's hand, the robot slides on tracks. Controlled wirelessly by a central computer or a remote controller, it can be placed on any surface of the building and respond accordingly to the occupants' needs or weather conditions.

Equipped with LED module, solar power panels and mini green plants, the green smart robot can function like an air conditioner when moving to the window and turning its lid structure, bringing wind into a designated spot in the room and regulating indoor air flow to reduce dependence on air conditioning. When moving to the roof area, the robot can restore solar power and serve as a kinetic sunlight shield. The photosynthesis of the green plants can absorb carbon dioxide indoor and release oxygen. In the future, a small fan can be added to enhance indoor air circulation to save more energy and further reduce carbon emissions. The modular robots can move in individual or in group to form artistic and entertaining patterns. Window cleaning machine, automatic fire sprinkler system, and mini projector can also be added onto the robot in later generation designs.

The Motioned Space Spirits with Green Technology designed by NCKU is featured with efficient solar tracking and power generating and storage function, ventilating function, object sensing automatic lighting apparatus, and versatile space utilization. Po-Wei Chen said that they will research on applicability of household robot, mini wind power generator system, environmental sensing system, and remote inspection system, etc. in the future.



Academician Michael Ming-Chiao Lai, President of NCKU, with the cross-disciplinary research team at NCKU.

Prof. Mi-Ching Tsai, director of this project, said that this is a three-year integration project sponsored by National Science Council (NSC), Taiwan, and to their amazement, so much could have been achieved in one year. Based on the synergy among team members, he anticipates more accomplishments to come.