NCKU professor won 2 major automation awards in ICRA 2013
NCKU Press Center

NCKU Institute of Manufacturing Information and Systems (IMIS) Chair Professor Dr. Fan-Tien Cheng has received the “2013 IEEE Inaba Technical Award for Innovation Leading to Production” and the “Best Automation Paper Award” by the Institute of Electrical and Electronics Engineers Robotics and Automation Society (IEEE-RAS) during the 2013 IEEE Conference on Robotics and Automation (ICRA-2013) held in Karlsruhe, Germany.

Dr. Cheng, who returned to NCKU on May 22, was greeted with overwhelming response from teaching staff and students at NCKU, celebrating Dr. Cheng and his research team’s success in obtaining two major awards in the IEEE conference.

These awards symbolize the recognition of his creation, the “Automation Virtual Metrology System” and its outstanding contribution to industrial development.

The “Automation Virtual Metrology System” is currently being used in high-tech industries, where it is capable of reducing greatly the frequency of product sampling tests as well as increase product yield, thus achieving the purpose of decreasing overall production cost.

Apparently, the machine tools industry is highly interested in this system as it hopes that this system can be applied to the production line of this industry.

For this reason, Dr. Cheng initiated a joint collaboration effort involving the members of the NCKU e-Manufacturing Research Centre, Falcon Machine Tools Company, National Chung Cheng University Advanced Institute of Manufacturing with High-Tech Innovations (CCU AIM-HI) and Precision Machinery Research and Development Center (PMC).

This joint collaboration team participated in the Taiwan International Machine Tool Show (TMTS) held in November 2012 in Taichung and the Taipei International Machine Tool Show (TIMTOS) held in March 2013 at the Nangang Exhibition Hall.

Besides, the team has also successfully carried out a live demonstration of the AVM real-time for predicting machining precision by linking “Smart Manufacturing with Cloud Computing” to remote machine tools located at Falcon’s factory in Chang-Hua, where its outcome has received huge recognition from the industry.
The research team led by Dr. Cheng included NCKU IMIS PhD student Hao Tieng, National Kaohsiung First University of Science and Technology (NKFUST) Prof. Hao-Ching Yang, and Prof. Min-Hsiung Hon from Chinese Culture University (PCCU).

The team produced a conference paper titled “A Novel Virtual Metrology Scheme for Predicting Machining Precision of Machine Tools” which documented the research outcome obtained by the team by implementing AVM on machine tools, and submitted the paper to ICRA 2013.

ICRA is an international academic conference known as the most important conference with the highest standing in the field of robotics and automation. Based on statistics, ICRA 2013 has received 2265 paper submissions from 63 countries; however, only 873 papers have been accepted, indicating an acceptance rate of 38.5%. It is noteworthy to mention that the conference paper written by Dr. Cheng’s research team has not only been accepted, it has also won the Best Automation Paper Award in the conference.

The “Automation Virtual Metrology System” developed by Dr. Cheng and his team incorporates virtual metrology to machines of the same type or the same machine to reduce reaction time and labor costs, as well as maintain the precision of virtual metrology. This system can also automatically evaluate and screen process data and actual measurement data, thus fully meeting the virtual metrology needs of the entire plant.