

Education, Research & Practical Innovation of IoT Technology in Building Construction

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Abstract: Internet of Things (IoT) is no longer a future technology, but is so heavily involved in everyday life of human beings. Currently it is estimated to have 10 billion connected devices and sensors in the world. The types of businesses related to IoT are expected to be more than 30 billion ones, and by 2025, 75 billion devices and sensors will be easily connected. This would generate “service” revenue of about 300 billion USD by IoT product and service suppliers until 2020, and add over 1.9 trillion USD to global economy according to a Gartner Trend Insight Report (2013). In order not to miss this opportunity, there are a variety of efforts by Seoul National University (SNU) and Dr. Thomas Kang’s research team in terms of education and research. There are several IoT courses available for both undergraduate and graduate students at SNU. Among them, one IoT smart home class is particularly targeted for the students in the Department of Architecture and Architectural Engineering at SNU, where the Arduino language, hardware, sensor, interface, actuator control, and smart phone app making are taught by incorporating hands-on practice and lab sessions. At the same time, innovative research efforts on the IoT high-techs in combination with building construction are led by Dr. Kang. It is important to see the market needs and pin-point the research direction, because IoT technicians are typically not aware of how the technology is specifically applied in the real industry.

As a result, Precision-Hayes International, global provider of post-tensioning (PT) products and solutions, recently signed a license agreement with Dr. Kang’s research team for the use of Dr. Kang’s technology that has the potential to be an industry game changer by simplifying, automating, and improving the accuracy of measuring, recording, and verifying elongations and forces of PT steel. The new IoT technology uses cutting edge measuring equipment to record steel elongation and PT force. These technology breakthroughs simplify current tedious methods and significantly improve the accuracy of data, contributing to improved structural integrity of the concrete building being post-tensioned.