Innovative Research Solutions with Industry

Aerospace

CLIENT:
United Technologies Research Centre (UTRC-Ireland)

AREA:
Embedded Systems/ Energy Management

Building energy management solutions: national sustainable building energy test bed

CIT CORK INSTITUTE OF TECHNOLOGY
INSTITIÚID TEICNEOLAÍOCHTA CHORCAÍ

ITI Institutes of Technology Ireland

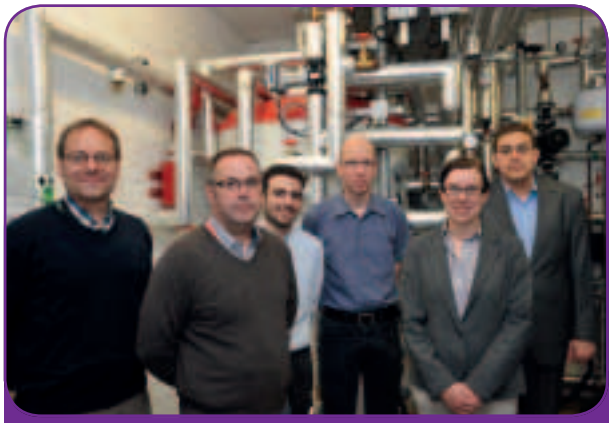
United Technologies Research Center (UTRC) delivers advanced technologies to the businesses of United Technologies Corporation (UTC), a diversified global leader in high-tech aerospace and building systems products/services.

UTRC-Ireland serves as UTRC's European hub to accelerate the development and demonstration of technologies that address security, energy efficiency and integrated building systems.

Integrated energy management solutions for energy-efficient buildings represent a key strategic area within UTC's business portfolio. To this end, in partnership with CIT, UTRC-Ireland has developed a 'National Sustainable Building Energy Test Bed' on the CIT campus, which integrates thermal and electrical systems, and facilitates the demonstration of whole building energy management solutions in areas of controls, optimization, diagnostics and power electronics.

UTRC is relying on CIT's proficiency in Wireless Sensor Networks and Embedded Systems, which are a key element of those solutions. In that regard, the objective is to develop a middleware platform that supports self-configuration of wireless constrained devices providing a set of basic resources used in HVAC, lighting and access control applications.

The Nimbus Centre for Embedded Systems Research, overseen by Dr. Dirk Pesch, is a 60 person research centre on the CIT campus. (see www.tec-centre.ie and www.nimbus.cit.ie) The proficiency of Dr. Pesch and his group includes: wireless sensor network design and tools; communication protocols for wireless sensor networks; middleware platforms for embedded systems; cloud-based service platforms.



Dr. Dirk Pesch CIT, Mr. Dave Hamilton CIT, Dr Virgilio Valdivia-Guerrero (UTRC), Mr. Hubertus Wiese (UTRC), Ms. Sarah O'Connell (UTRC), Dr. Alie El-din Mady (UTRC)

In the area of building energy management solutions, the work with CIT has primarily involved the development of a 'National Sustainable Building Energy Test Bed' for integrated thermal/ electrical energy management systems. However, other collaborative activities between UTRC ···>

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United Technologies Research Center

and CIT include: research into communication protocols and middleware for automatic discovery of machine-to-machine communication services in wireless embedded systems, and development of wireless network design tools.

The activities with UTRC were funded directly through the company as well as through two FP7 project awards e.g. FP7 SCUBA (co- ordinated by CIT) and FP7 COOPERATE. CIT and UTRC also collaborated on the SFI strategic research cluster ITOBO and are actively involved in joint International Energy Research Centre projects.

The key output from the partnership to date is the National Sustainable Building Energy Test Bed based at CIT. This has served as the demonstration platform for a number of awarded proposals for Irish and European funded research projects (e.g. FP7 COOPERATE, GENIC and SPARKS), in addition to conference publications and journals. Additional partners are being attracted by UTRC, based on UTRC's positive experience with CIT.

The partnership with CIT has enabled UTRC to scale research operations in Cork. Furthermore, it has allowed UTRC to deliver on their internal research and innovation targets and meet co-financing objectives. The company has recruited research staff from CIT as a result of the partnership. In addition the project resulted in several peer-reviewed conference and journal publications, including a demonstration at the Sensys '12 demo session (leading conference in Wireless Sensor Network domain) and an IEEE Communications journal article (most cited Telecommunications journal). ■

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Sarah O'Connell

Senior Research Engineer, UTRC

"The collaboration between UTRC Ireland and CIT has led directly to our partnership on a number of successful European FP7 proposals, in addition to CIT providing outputs, through direct contracts, which have advanced our company's strategic research agenda"

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