***Job Reference:*** 3194650

***UTRCI Research Scientist, Control Systems***

**Grade: L6-L5**

United Technologies Research Center (UTRC) delivers advanced technologies to the businesses of United Technologies Corporation (UTC). UTC (NYSE:UTX) is a diversified company that provides a broad range of high-technology products and services to the global aerospace and building systems industries. UTC's commercial businesses are Otis elevators and escalators and UTC Climate, Controls & Security, a leading provider of heating, ventilation, air conditioning, fire and security systems, building automation and controls. UTC’s aerospace businesses are Sikorsky Aircraft Corporation and the new UTC Propulsion & Aerospace Systems, which includes Pratt & Whitney aircraft engines and UTC Aerospace Systems aerospace products.

UTRC partners with UTC business units and external research organizations to expand the boundaries of science and technology through research and innovation, delivering technology options that meet and anticipate the needs of the marketplace.

Founded in 1929, UTRC is located in East Hartford, Connecticut (U.S.), with an office in Berkeley, California, and research and development centers in Shanghai, China, and Cork, Ireland.

United Technologies Research Centre Ireland, Ltd. (UTRCI) is UTRC’s European research hub, created to fully leverage a global network of innovation. UTRCI works with universities, research institutes, and industry throughout Europe and beyond to further its research and development mission. UTRCI invites qualified individuals to apply for the following position in its Cork office. A competitive compensation and benefits package will be provided to the successful candidates.

Learn more @ [www.utrc.utc.com](http://www.utrc.utc.com)

**Job Responsibilities**

UTRCI seeks candidates with expertise in control system design and analysis for high performance buildings. The successful candidate will have a demonstrated ability to synthesize optimal, supervisory control system architectures and algorithms, develop control-oriented modeling methods, and perform control system rapid prototyping with applications to buildings and energy microgrid systems. The position requires analytical skills related to control and optimization, with experience using computational modeling tools for development and analysis. An understanding of building physics, including heat transfer and fluid flow, is preferred. The successful candidate will work as part of technology teams in developing new technologies that will provide a competitive advantage for UTC’s business units.

The ideal candidate is a self-starter who works well in an international teaming environment, is extremely well-organized and has excellent interpersonal, leadership and communication skills. Besides technical excellence, an entrepreneurial attitude towards innovation is essential.

**Education**

A minimum of a doctoral degree in mechanical, electrical or control engineering, or a master’s degree with a minimum of 5 years of industrial or academic relevant experience is required. A PhD with post-doctorate industrial or academic experience is preferred.

**Experience/Qualifications**

The ideal candidate will have experience in several of the following areas:

* Experience applying system identification techniques and knowledge of MIMO systems parameter identification methods. Experience with estimation techniques, such as Kalman Filters.
* Ability to develop physics-based, non-linear dynamic control and analysis-oriented system level models for building and distributed power systems.
* Demonstrated ability to analyze and optimize complex systems including nonlinear, time-varying dynamical subsystems with uncertain parameters.
* Experience in selecting control algorithm/architecture based on scientific principles and product integration needs. Control problems encountered in the applications of interest require a wide range of solutions including SISO controllers (PID, lead-lag, and gain scheduling), as well as MIMO controllers (typically based on optimization techniques including MPC techniques) for time-varying nonlinear subsystems.
* Ability to incorporate system input and state constraints into control algorithm design as well as dealing with uncertain parameters and disturbances.
* Experience providing control implementation specifications both for rapid prototyping and industrial code implementation.
* Experience with development/application of modeling and simulation programs to analyze building and distributed power systems, thermal and electrical loads and performance.
* MATLAB, Simulink, C, C++, modeling languages for optimization programming (e.g. AMPL), linear and non-linear optimization software (e.g. IpOpt, CPLEX, Gurovi).
* Exceptional communication skills, demonstrated commitment to deliver results, adaptability and the ability to work in a teaming environment.
* Ability to execute technology research plans to successfully achieve desired technical outcomes within time and budget constraints.
* Some travel required.

In addition, experience in the following areas will be highly regarded:

* Ability to synthesize controllers for hybrid systems where switching occurs between several modes of operation, each one with different continuous dynamics.
* Hierarchical control or distributed control background.
* Familiarity with time delay and nonlinearity compensation.
* Familiarity with rapid prototyping methodologies and environments. Demonstrated experience with automatic code generation tools and control design validation procedures would be a definite asset. Experience with HIL incorporating system simulations would be ideal.
* Field experience with implementation of building control systems.
* Familiarity with HVAC equipment performance including vapor compression products, air distribution and building management systems.
* Familiarity with Distributed Power and Energy storage systems, including solar PV, wind turbines, biomass, cogeneration, and battery technologies.
* Experience working with Government agencies and proposal development.

**Additional Comments**

This position is based at UTRC’s European hub in Cork, Ireland. To be eligible to apply, candidates must be legally entitled to work and reside in Ireland.

Candidates can apply online at: <http://www.utrc.utc.com/pages/Career/Job_openings.html> by selecting “Ireland” from the “Country” pull-down menu and clicking “Begin Search”

United Technologies Corporation is An Equal Opportunity/Affirmative Action Employer.