

Monday Keynote

Cyber Physical Systems: Systems Engineering of Industrial Embedded Systems - Barriers, Enablers and Opportunities



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Abstract: Systems engineering is evolving. The demand for higher levels of performance, interconnectivity and differentiation by customers has increased dramatically when compared with the recent past – driven increasingly by the ability to put functionality into products through software. Concurrently, recent advances in methods, tools and techniques for designing complex products are available that can empower engineering teams today with radically new approaches for ensuring performance, enhancing reliability and reducing lifecycle cost. In this climate of increasing expectations, engineering processes, methods & tools that were successful in the past for simpler systems are inadequate – indeed, may even fail catastrophically – for the design of complex products. This is especially true for products that require the co-design of integrated hardware and software components, also termed “cyber-physical systems” which is typical of system offerings in the market today.

This talk will present a working definition of systems engineering that is useful across large complex systems that are found in aerospace and building sectors that are particularly needed to innovate effectively in developing products that address energy efficiency issues. The talk will address specific issues in cyber-physical systems and what is currently available as well as outlining needs and current research issues.

Biographical Sketch: Dr. Clas A. Jacobson is Chief Scientist for the United Technologies Systems & Controls Engineering (UTSCE) organization. In this role he works with the UTC business units to ensure capability in systems engineering and controls is available for product development. Prior to his role as Chief Scientist for UTSCE he worked as the Chief Scientist, Controls for UTC and before that at the United Technologies Research Center (UTRC) in management and technical positions since 1995. He has held positions at UTRC as Director of the Carrier Program Office responsible for creating and managing projects in a stage gate project planning and execution process and also Director of the Systems Department at UTRC responsible for capability in the areas of systems engineering. Dr. Jacobson received his Ph.D degree in electrical engineering in 1986 from Rensselaer Polytechnic Institute. He was an Associate Professor at Northeastern University in Boston from 1986-1995.