Sustainable Cyber-Physical Systems

Zsók Viktória[a]

[a]Eötvös Loránd University, Faculty of Informatics
Department of Programming Languages and Compilers
H-1117 Budapest, Pázmány Péter sétány 1/c.
zsv@inf.elte.hu

Extended abstract

Nowadays green computation is one of the most prevailing system design form, where the highly energy efficient solutions are dominating.

The cyber-physical systems [5] development is in continuous need for energy efficient design and management of their system components, input signals of the devices and the data processing in order to obtain an energy efficient behaviour of the smart environments [2].

Studying relationships between different distributed systems are highly important in the designing and modeling steps of the sophisticated systems description.

The efficient coordination of components is essential for assuring optimal energy usage of the constituent elements. We propose an energy aware coordination model to concert the events of a cyber-physical system modelling.

The model includes prototyping and efficiently coordinating the signal reading and transmitting components, managing by pooling the events. It also handles the save and safe triggering actions that are handling the events occurred and managing information flowing on communication channels.

The system modeling type enables the definition and the integration of special components into complex systems energy efficient services. The system functionalities are defined in an interactive way, where the base components and the relationship between them can be controlled in terms of their energy usage.

In the CPS system design important questions of semantics are usually addressed from probabilistic and behavioral viewpoints only. However, when considering the interoperability with other complex systems the novel trend [1, 3] is to estimate and predict the energy efficiency as well as the green label features.

The collaborating units, the model's actors, the full prototype of a system, the a priori established features demand energy aware considerations as well. The CPS systems design and model [4] generalizations in current sustainable trends are thoroughly analyzed in green policy contexts, and categorized based on green label features.

The goal is to reevaluate earlier smart systems applications and place them in the new context of efficiency, especially SmartHome applications. The embedded units are monitored and controlled by the physical processes inside a complex network. The key steps are in designing, modeling, analyzing and efficiently implementing in iterative way, by adjusting refinement steps the coordination and the control of the envisaged sensor based distributed system.

References

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