Modeling and Verifying CPS

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Abstract   This presentation will introduce simple ways for modelling dynamic and discrete cyber parts of cyber-physical systems. We will show also that these models can be part of a whole model and through the knowledge of the model of the physical system simulated. This is possible by applying the framework of functional mockup units. We will concentrate the presentation on the problem of verifying cyber parts and in particular on the problem of managing the combinatorial complexity of this verification. Various approaches will be introduced and we will finally provide details on our symbolic model checking techniques that can generalise the well known binary decision diagram (BDD) approach. This framework can be used to model check high level models with efficient reduction of the necessary computations.

Keywords   modeling, verification, decision diagram, model checking, combinatorial explosion