Current Needs for Integration of Timing Analysis in Industrial System Engineering

Rafik Henia

Thales Research & Technology France

Rafik.Henia@thalesgroup.com

Due to the growing complexity of real-time software it becomes more and more difficult to predict how design decisions may impact the system timing behavior. Current industrial practices usually rely on the subjective judgment of experienced software architects and developers. This is however risky since eventual timing errors are only detected after implementation and integration, when the software execution can be tested on system level, under realistic conditions. At this stage, timing errors may be very costly and time consuming to correct. Therefore, to overcome this problem we need an efficient, reliable and automated timing estimation method applicable already at early design stages to guarantee that the designed system meets its timing requirements before time and resources are invested for the system implementation. Formal timing analysis appears at first sight to be the adequate candidate for this purpose. However, its use in the industry is conditioned by a smooth and seamless integration in the system engineering process. This task is not easy and is very often hindered first by the lack of engineering methods at early design levels allowing providing to the analysis tools the required input data for the analysis (timing characteristics, scheduling characteristics, etc.) and second, by the semantic mismatches between the design and analysis models. This talk addresses the issue of integrating timing analysis in industrial system engineering based on our experience at Thales.