Optimisation of Performance Metrics
of Embedded Hard Real-Time Systems
using Software/Hardware Parallelism

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100-word summary

Safety-critical embedded systems have strong requirements in terms of reliability and timing behaviour. They must have a long autonomy, good performance and minimal costs.

Classic design techniques are not sufficient to cope with these requirements. We studied techniques at the operating system level to reduce the energy consumption while satisfying application timing requirements.

We provided the theoretical foundations of these techniques and validate them through practical experiments. Our results show that using parallel and power-aware scheduling techniques in order to exploit hardware and software parallelism allows to execute embedded applications with substantial savings in terms of energy consumption.