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  author = {Felipe Klein and Roberto Leao and Guido Araujo and
            Luiz Santos and Rodolfo Azevedo},
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    \par\selectlanguage{english}\textbf{Abstract}
       Although SystemC is considered the most promising language
for
       system-on-chip functional modeling, it doesn't come with
power
       modeling capabilities.  This work presents PowerSC, a novel
       power estimation framework which instruments SystemC for
power
       characterization, modeling and estimation. Since it is
entirely
       based on SystemC, PowerSC allows consistent power modeling
from
       the highest to the lowest abstraction level. Besides, the
       framework's API provides facilities to integrate alternative
       modeling techniques, either at the same or at different
       abstraction levels. As a result, the required power
evaluation
       infrastructure is reduced to a minimum: the standard SystemC
       library, the PowerSC library itself and a C++ compiler.
       Although RTL power macromodeling is a mature research topic,
it
       is not yet broadly accepted in the industrial environment.
One
       of the main reasons impairing its widespread use as a power
       estimation paradigm is that each macromodeling technique
makes
       some assumptions that lead to some sort of intrinsic
       limitation, thereby affecting its accuracy.  Therefore,
       alternative macromodeling methods can be envisaged as part of
a
       power modeling toolkit from which the most suitable method
for
       a given component should be automatically selected.  This
paper
       describes a new multi-model power estimation engine that
       selects the macromodeling technique leading to the least
       estimation error for a given system component depending on
its
       input-vector stream properties. A proper selection function
is
       built after component characterization and used during
       estimation.  Experimental results show that our multi-model
       engine improves the robustness of power analysis, reducing
       significantly the average and the maximum estimation errors,
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as
       compared to conventional single-model estimation.
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