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Statistical Design - an Incomplete Solution

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Technical Session II

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Statistical Design an Incomplete Solution

Abstract

The real problem is, as this session is titled, Designing robust systems under uncertain conditions . The problem is that much (usually most) of the uncertain conditions are not statistical. For example, suppose we are designing a block. It may get included in the center of the optical field, or on the edge. It may be included rotated or reflected. It may sit in a region of high or low metal density. All of these are uncertain conditions, but are not random. We need an approach that allows to compute the effects of both systematic and random uncertainties.

What we need is not statistical design, but sensitivity driven design. We must keep track of the sensitivities of each relevant variable timing, power, yield to the underlying physical uncertainty. If a dielectric is 1 nm thicker, if metal is 1 nm wider, we should be able to predict the effect on each metric of our design. If we can do this statistical analysis is straightforward. But more importantly, we gain the ability to account for systematic variations, to drive our optimization algorithms directly, to retain the use of hierarchy and IP.

This talk will address this problem concerning its technical and political aspects. The first part will describe how a solution might work technically, what problems it can solve, and what the advantages and disadvantages are. The second part will discuss what would be needed for this to happen from a business point of view. New libraries and models, new standards for interchange of data, new tools, and new data from fabs, all are required.

Curriculum Vitae



Lou Scheffer Fellow Cadence Design Systems

He is a Fellow with Cadence Design Systems. His main interests are in the physical implementation of ICs floorplanning, placement, routing, and design for manufacturing.

He is the author of numerous articles and tutorials, editor of several books, and chair of the industry conferences ISPD, SLIP, and TAU. Some of his outside interests are radio astronomy and SETI.

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