

## **Georgios Konstadinidis / Google**

### **"Closing the gap between Reliability Physics, EDA and Circuit Design"**

Accurate Circuit Reliability analysis is essential in reducing design margins and time to market, while at the same time enabling high levels of product performance and reliability.

The goal of this Tutorial is to bring awareness and mutual understanding of the constraints across the various disciplines, and help strike a balance in the definition of the reliability rules, their implementation in EDA tools and their proper usage by the circuit designers.

Following a brief description of the circuit reliability issues, the Physics behind them and the main characterization techniques we will provide an overview of the circuit techniques used to account for and mitigate these issues, and elaborate on the requirements imposed on the EDA tools. We will highlight common in situ monitoring and adaptive techniques to control the reliability and maximize performance over the lifetime of the product, and provide a brief introduction to product level testing techniques and what to do or not do during HTOL.

Understanding how all this fits together is critical in establishing the skeleton of a Reliability Physics, EDA, and circuit design closed loop methodology.

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**Georgios K. Konstadinidis** is a Technology and Chip Implementation Lead at Google focusing on the R&D of Machine Learning Accelerators. He received the Ph.D degree in electrical engineering from the Technical University of Berlin, Germany and a B.Sc. Degree in Physics, M.Sc. in electronics from the Aristoteles University Thessaloniki Greece. From 2010 to 2017 he was a Senior Hardware Architect at Oracle, focused on high performance microprocessor physical design. He has been involved in the technology, design porting, physical design, reliability, optimization, circuit methodology, signal integrity, timing, and CAD tools for several projects. From 1991 to 1995 he was the leader of the high performance bipolar ICs design team at the R&D Center of SGS Thomson in England and in Catania, Italy. He was involved in the design of several ICs for telecommunications, in device modeling and process optimization.

Dr. Konstadinidis holds 12 patents and has several IEEE publications. He served as a member of the ISSCC Digital Program Committee from 2002 to 2007, and as Guest Editor for the IEEE Journal of Solid State Circuits. He is a co-author of the book "Clocking in Modern VLSI Systems", Springer, 2009. He currently serves as Chair of the IRPS Digital Circuit Reliability sub-committee.