

# NEEDS

## Statistical SPICE Modeling Using Backward Propagation of Variance (BPV)

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MSEE 239

### **Abstract:**

A key part of IC design is to characterize manufacturing variations in circuit performances. This requires accurate statistical circuit simulation models. The different types of statistical models that are required for different types of statistical circuit analyses will be reviewed, and the advantages and disadvantages of common approaches to generating these models will be discussed. The backward propagation of variance (BPV) technique will be covered in detail, showing that it almost "cheats" by force-fitting a model to give the desired results. Commonly overlooked issues with using digital worst- and best-case corner models for the design of analog CMOS circuits will also be presented.

### **Bio:**

Colin McAndrew received the Ph.D. degree in Systems Design Engineering from the University of Waterloo, Ontario, Canada, in 1984. From 1987 to 1995 he was at AT&T Bell Laboratories, Allentown, PA, and since 1995 he has been with Freescale Semiconductor (formerly Motorola Semiconductor Products Sector), Tempe, AZ, where he is at present a Fellow of Technical Staff. Dr. McAndrew is a Fellow of the IEEE, was an Editor of the IEEE Transactions on Electron Devices from 2001 to 2010, is or has been on the technical program committees for the IEEE BCTM, ICMTS, CICC, and BMAS conferences, and received best paper awards for ICMTS in 1993 and 2012 and CICC in 2002.