Stanford

Robert Dutton

Robert and Barbara Kleist Professor in the School of Engineering, Emeritus

Electrical Engineering

Bio

BIO

Dutton's group develops and applies computer aids to process modeling and device analysis. His circuit design activities emphasize layout-related issues of parameter extraction and electrical behavior for devices that affect system performance. Activities include primarily silicon technology modeling both for digital and analog circuits, including OE/RF applications. New emerging area now includes bio-sensors and the development of computer-aided bio-sensor design.

ACADEMIC APPOINTMENTS

- Emeritus Faculty, Acad Council, Electrical Engineering

HONORS AND AWARDS

- J.J. Ebers Award, Institute of Electrical and Electronics Engineers (1987)
- Jack A. Morton Award, Institute of Electrical and Electronics Engineers (1996)
- SIA University Researcher Award, Semiconductor Industry Association (2000)
- Phil Kaufman Award, Electronic Design Automation Consortium (2006)

BOARDS, ADVISORY COMMITTEES, PROFESSIONAL ORGANIZATIONS

- member, National Academy of Engineering (1991 - present)
- Member, Semiconductor Industries Association (2005 - present)

PROFESSIONAL EDUCATION

- PhD, UC Berkeley (1970)

LINKS

- http://www-tcad.stanford.edu/tcad/bios/dutton.html: http://www-tcad.stanford.edu/tcad/bios/dutton.html

Publications

PUBLICATIONS

- **Workload Dependent NBTI and PBTI Analysis for a Sub-45nm Commercial Microprocessor** *IEEE IRPS, Anaheim, CA*
  Mintarno, E., Chandra, V., Pietromonaco, D., Aitken, R., Dutton, R., W.
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- **Applications of NanoNewton Dielectrophoretic Forces using Atomic Layer Deposited Oxides for Microfluidic Sample Preparation and Proteomics**

Emaminejad, S., Javanmare, M., Gupta, C., Dutton, R., W., Davis, R., W., Howe, R., T.
2013

- **Smart surfaces: Use of electrokinetics for selective modulation of biomolecular affinities**
  Emaminejad, S., Javanmard, M., Dutton, R., W., Davis, R., W.
  2012
- **Efficient Control of DNA Transport in Nanopore-based Nanofluidic Transistors**
  Paik, K., H., Liu, Y., Tabard-Cossa, V., Huber, D., Provine, J., Howe, R., Dutton, R. W.
  2011
- **An Electronic Microfluidic Switch using Dielectrophoresis for Control of Microparticles**
  Javanmard, M., Emaminejad, S., Dutton, R., W., Davis, R.
  2011
- **Smart Surfaces: Use of Electrokinetics for Selective Modulation of Biomolecular Affinities** *MRS Fall Meeting, Boston, MA*
  Emaminejad, S., Javanmard, M., Dutton, R., W., Davis, R., W.
  2011; 1414
- **Field Effect Resistor, a Single-Device-at-Pad Solution for ESD Protection in Deeply Scaled SOI Technology**
  Cao, S., Salman, A., A., Chun, J., H., Beebe, S., G., Pelella, M., M., Dutton, R., W.
  2010
- **Modeling and RF Analysis of Silicon Inter-band Tunnel Diode with THz Cut-off Frequency**
  Kim, K., R., Kang, I., M., Dutton, R., W.
  2010
- **Investigation on Output Driver with Stacked Devices for ESD Design Window Engineering**
  Cao, S., Chun, J., H., Choi, E., Beebe, S., Anderson, W., Dutton, R., W.
  2010
- **Optimized Self-Tuning for Circuit Aging**
  Mintarno, E., Skaf, J., Zheng, R., Velamala, J., Cao, Y., Boyd, S., Dutton, R. W.
  2010
- **Electrical Modulation of Ion Concentration in Dual-Gated Nanochannels**
  Liu, Y., Ran, Q., Dutton, R., W.
  2010
- **ESD Design Challenges and Strategies in Deeply-Scaled Integrated Circuits**
  Cao, S., Chen, T., W., Beebe, S., G., Dutton, R., W.
  2009
- **Field Effect Diode for Effective CDM ESD Protection in 45nm SOI Technology**
  Cao, S., Beebe, S., G., Salman, A., A., Pelella, M., M., Chun, J, H., Dutton, R., W.
  2009
- **Numerical Flicker Noise Model for Dual Channel FETs**
  Chen, C., Y., Liu, Y., Dutton, R., W., Sato-Iwanaga, J., Inoue, A., Sorada, H.
  2009
- **The Role of Surface Charge and Binding Properties in Silicon-Based Field Effect Nanowire Biosensors** *Transducers 2009, Denver, CO*
  Liu, Y., Dutton, R., W.
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- **Modeling and Simulation of Orientation-Dependent Fluctuations in Nanowire Field-Effect Biosensors Using the Stochastic Linearized Poisson-Boltzmann Equation**
  Heitzinger, C., Ringhofer, C., Liu, Y., Dutton, R., W.
  2009

- **Lateral Ge/SiGe/Si Hetero-channel p-Type MOSFETs**
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- **Double-Well Field Effect Diode vs. SCR Behavior under CDM Stress in 45nm SOI Technology**
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  Liu, Y., Lilja, K., Heitzinger, C., Dutton, R., W.
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- **Simulation of p-n Junction Properties of Nanowires and Nanowire Arrays**
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- **Modeling and Simulation of Jitter in Phase-Locked Loops due to Substrate Noise**

Kim, J., W., Lu, Y., C., Dutton, R., W.
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- **Linearity Analysis of RF LDMOS Devices Utilizing Harmonic Balance Device Simulation**
  Tornblad, O., Ito, C., Rotella, F., Ma, G., Dutton, R., W.
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- **Electro-Thermal Simulations of Nanoscale Transistors with Optical and Acoustic Phonon Head Conduction**
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  Kim, K., R., Dutton, R., W.
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- **A New Method for Sensitivity Analysis of Photonic Crystal Devices**
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- **Small-Signal Modeling of RF CMOS** *IEEE International Conference on Simulation of Semiconductor Processes and Devices (SISPAD), Munich, Germany*
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  Lan, H., Yu, Z., Dutton, R., W.
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  Yu, Z., Yergeau, D., W., Dutton, R., W.
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