

## Ron J. Pieper: Current Research Interests

Memristors, solid state devices, fiber optics, optical engineering, quality control and reliability, numerical analysis chaos problems, engineering education.

### ***Refereed Journal Publications:***

- R.J. Pieper, C.Y. Peng, “ Binomial Sampling Charts Revisited with Graphical and Analytical Arguments”, IETE Journal of Education, DOI:10.1080/09747338.2015.1025864, Volume 57 :1 pp20-27, March (2015)
- M Rudra , R. Pieper, “Memristor characteristics via an integration of drift and tunnel barrier models”, Electronics and Telecommunication Engineers (IETE Journal of Research), DOI: 10.1080/03772063.2015.1026851, & Volume 61, Issue 4, 2015 pages 440-443, Feb ( 2015)
- M. Rudra, S. Gazabare, R. Pieper, “Predicting Limits For Memristor On-Off Resistances Consistent With Linear Drift Model,”Institute of Electronics and Telecommunication Engineers (IETE Journal of Research), Vol 60, dx.doi.org/10.1080/03772063.2014.890817, #1, pp 46-49, (2014)
- W. T. Wondmagegn, N. T. Satyala, I Mejia-Silva, D. MaoH. J. Stiegler, M. A. Quevedo-Lopez, R. J. Pieper, and B. E. Gnade,” Experimental and modeling study of the capacitance-voltage characteristics of metal-insulator-semiconductor capacitor based on pentacene/parylene”, Thin Solid Films, 519, 4413-4418 (2011)
- W. T. Wondmagegn, N. T. Satyala, H. J. Stiegler, M. A. Quevedo-Lopez, E. W. Forsythe, R. J. Pieper, and B. E. Gnade, “Simulation Based Performance Comparison of Transistors Designed Using Standard Photolithographic and Coarse Printing Design Specifications”, Thin Solid Films, 519, 1943-1949 (2011)
- W. T. Wondmagegn, N. T. Satyala , R. J. Pieper, M. A. Quevedo-Lopez, S.Gowrisanker, H. N. Alshareef, H. J. Stiegler, and B. E. Gnade, “Impact of Semiconductor/Metal Interfaces on Contact Resistance and Operating Speed of Organic Thin Film Transistors”, Journal of Computational Electronics, Vol 10, pp144-153 (2011)
- Wudyalew T. Wondamagegn and Ron J. Pieper, “ Simulations of Top-Contact Pentacene Thin Film Transistors”, *Journal of Computational Electronics*, Vol. 8, pp 19-24, (2009).
- Ron Pieper, Deborah Koslover, and Ting-Chung Poon, “An exact solution for four-order acousto-optic Bragg diffraction with arbitrary initial conditions”, Applied Optics, Vol 48, No 7, pp 141-150, March (2008) .
- Nikhil T. Satyala, R. J. Pieper, “A Unified Approach to Predicting Long and Short Term Capability Indices with Dependence on Manufacturing Target Bias” *International Journal of Quality, Statistics and Reliability*, Article ID 594793, 10 pages, Volume (2008).

Ron J. Pieper and Sherif Michael, "Comprehensive Approach to Predicting freeze-out and exhaustion in uniform single impurity Semiconductors in Equilibrium", *IEEE Transactions on Education*, pp413-421 (2005)

***Refereed National/International Conferences with Proceedings:***

Ron J. Pieper and Wudyalew T Wondamagegn, "Introducing Angular Plane Wave Spectrum Concepts and Applications in an Undergraduate Communications Course", Presented at the ASEE Annual Conference, Proceedings Paper ID Paper ID #9393, Indianapolis Indiana, June 16 2014

Nikhil Satyala, Wudyalew Wondmagegn, Ron Pieper and Michael Korn , "Simulation of copper phthalocyanine (CuPc)/fullerene (C60) heterojunction photovoltaic cell with and without electron transport layer (ETL)," MRS Society Proceedings, Volume 1212, *Organic Materials and Devices for Sustainable Energy Systems*, Editors Jiangeng Xue, Russell Holms, Barry Rand, Chihaya Adachi, ISBN 978-1-60511-185-8, p77-82, 2010

Nikhil Satyala, Wudyalew Wondmagegn, Ron Pieper and Michael Korn , "Simulation of copper phthalocyanine (CuPc)/fullerene (C60) heterojunction photovoltaic cell with and without electron transport layer (ETL)," *Materials Research Society Symposium Proceedings 2009 Fall Conference*, Vol 1212, 1212-S08-18, 2010

V. Puttagunata, W. T. Wondmagegn and R. J. Pieper, "Quasi static Modeling approach for Metal-Organic Semiconductor-Metal Devices," *Materials Research Society Symposium Proceedings Fall 2008 MRS Conference* , Vol. 1115, 1115-H08-40, 2009.

W. T. Wondmagegn, and R. J. Pieper, "Impact of Gate Metal Work functions on the device performance of organic thin film transistors," *Materials Research Society Symposium Proceedings*, Vol. 1115, 1115-H05-71, 2009

M. Shirvaikar, D. Beams and R. Pieper, "Back To Basics: A Student-Tutor Matching Program," *Proceedings of the American Society of Engineering Education Annual Conference, ASEE Annual Meeting*, Chicago, Illinois, June 2006

Ron. J. Pieper and Sherif Michael. "An Exact Analysis for Freeze Out and Exhaustion in Single Impurity Semiconductors", *ASEE Annual Meeting*, Session 1793, Portland Oregon, June 2005

***National Conferences (presentation only without proceedings)***

W. Wondmagegn, I. Mejia , A., H. J. Stiegler, M. A. Quevedo-Lopez, R. J. Pieper, and B. E. Gnade "Performance Comparison of Thin Film Transistors Based Operational Amplifiers", 2014

- Flexible & Printed Electronics Conference (Flex Tech Alliance ) Phoenix Convention Center, Phoenix Arizona Track B, Feb 6, 2014
- W. Wondmagegn, R. Pieper, N. Satyala, D. Mao, M. Quevedo-Lopez, S. Gowrisanker, H. Stiegler, B. Gnade, "Modeling and Characterization of Ferroelectric Capacitors Based on Poly(vinylidene fluoride-trifluoroethylene)", presented *Materials Research Society (MRS) Symposium Conference, San Francisco April 2011*
- W. Wondmagegn, N. Satyala, H. Jia, M. Quevedo-Lopez, S. Gowrisanker, H. Alshareef, H. Stiegler, U. Bhansali, R. Pieper, B. Gnade, "Characterization of Charge Injection and Transport in Organic Light Emitting Diodes Based on NPB and Alq3", presented *Materials Research Society (MRS) Symposium Conference, San Francisco April 2011*
- N. Satyala, V. Adusumilli, W. Wondmagegn and R. Pieper, "Simulation of PCBM n-channel Thin Film Transistor," Flextech 2010: Flexible Electronics & Displays Conference, Phoenix AZ, February, 2010.
- N. T. Satyala, W. T. Wondmagegn, R. J. Pieper, H. Stiegler, B. E. Gnade and M.A. Quevedo-Lopez, "Simulation Based Performance Comparison of Devices Designed Using Standard Photolithographic and Printing Design Specifications," Flextech 2010: Flexible Electronics & Displays Conference, Phoenix AZ, February, 2010.
- M. Korn, S. V. Adusumilli and R. Pieper, "Novel Bibenzo[b]thiophenes With Reduced Bandgaps as Determined by Density Functional Theory (DFT) Calculations," Materials Research Society (MRS) Symposium Conference, San Francisco CA April 2010.
- N. Satyala, W. Wondmagegn, R. Pieper, "Simulation modeling and comparison of Pentacene/C60 based bilayer and stacked organic solar cells," Spring Materials Research Society (MRS) Symposium Conference, (Session H14.28), San Francisco CA, April 2010.
- Debbie Koslover and Ron Pieper, "Four Order Acousto-Optic Diffraction for Bragg Incident Light" at the *AMS/AMA Annual Meeting*, Washington DC, Jan 2009
- Nikhil Satyala, Wudyalew Wondmagegn and Ron Pieper, "Simulation of copper phthalocyanine (CuPc)/fullerene (C60) heterojunction photovoltaic cell with and without electron transport layer (ETL)," Presented at the Fall 2009 (Session S-8.18) Materials Research Society Conference, Boston, MA, December 2009.
- W. T. Wondmagegn, and R. J. Pieper, "Impact of Gate Metal Work functions on the device performance of organic thin film transistors", (session H-570), *Fall 2008 MRS Annual Meeting*, Boston, MA, December 1-5, 2008
- V. Puttagunata, W.T. Wondmagegn and R. J. Pieper, "Quasi static Modeling approach for Metal-Organic Semiconductor-Metal Devices", (session H840) *Fall 2008 MRS Annual Meeting*, Boston, MA, December 1-5, 2008

***Other Conferences (peer reviewed) with Proceedings:***

- M. Rudra and R. Pieper, “Memristor Drift Model Based on Conservation of Mobile Vacancies” 45<sup>th</sup> IEEE Southeastern Symposium on System Theory, Waco TX, pp 12-16, March 2013,
- N. S. Pasupuleti, R. Pieper, W. Wondmagegn, A.L.Coogan, I. Mejia, A.-Villasenor, Manuel Quevedo-Lopez “Semi Empirical Cadmium Sulfide Transistor Model Combining Grain Defects and Semiconductor Thickness Variation”, 45<sup>th</sup> IEEE Southeastern Symposium on System Theory, Waco Texas, pp 6-11, March 2013
- Bikash Shrestha, Ron Pieper, Wudyalew Wondmagegn Duo Mao, Israel Mejia, Harvey Stiegler, Bruce E Gnade, Manuel Quevedo-Lopez, “A Practical Model to Analytically Characterize the Polarization Hysteresis of Ferroelectric Capacitor”, *Proceedings of the 44<sup>th</sup> IEEE Southeastern Symposium on System Theory*, pp 40-44, Jacksonville Florida, March 2012.
- Swetha Gazabare, Ron J. Pieper and Wudyalew Wondmagegn “*Observations on Frequency Sensitivity of Memristors*”, *Proceedings of 44<sup>th</sup> IEEE Southeastern Symposium on System Theory*, pp45-50, Jacksonville Florida, March 2012
- Joshua M. Jemegbe, Ron J. Pieper “*Performance Tests for a Micro-Integrator Algorithm which Reduces the Numerical Butterfly Effect in Time Evolving Nonlinear Systems*”, *Proceedings of the 44<sup>th</sup> IEEE Southeastern Symposium on System Theory*, pp 237-242, Jacksonville Florida, March 2012
- J. Sigdel, R. Pieper, W. Wondmagegn, V. Puttagunta and N. Satyala, "Fermi-Dirac Analysis and Simulation of an Organic Schottky Diode", Presented SouthEastCon Nashville Tennessee March 19, and in Conference Proceedings of the IEEE *SouthEastCon 2011*, p220-223, 2011
- Bikash Shrestha, Ron Pieper, Wudyalew Wondmagegn, Nikhil Satyala, "Modeling and Characterization for Polarization Hysteresis of Ferroelectric Polymers", Presented SouthEastCon Nashville Tennessee March 19, and in Proceedings of the IEEE *SouthEastCon 2011*, p450-454, 2011
- Swetha Gazabare, Nikhil Satyala, Wudyalew Wondmagegn and Ron J. Pieper, “Observations on Model Based Predictions for Memristor Power Dissipation”, Presented SouthEastCon Nashville Tennessee March 19, and in Proceedings of the *IEEE SouthEastCon 2011*, p224-227, March 2011
- Jiwan Sigdel, Vasu Puttagunta, Ron J. Pieper, Wudyalew T. Wondmagegn and Nikhil T. Satyala., “Quasi-static modeling of an organic Schottky diode with trapped charge,” 42nd IEEE Southeastern Symposium on System Theory, Tyler Texas,, T1A.1, pp. 253-257, March 2010.

- Ron J. . Pieper and Dan J. Blair, "A practical Solution to the numerical butterfly effect in chaotic systems for fast but memory limited computers", 42nd IEEE Southeastern Symposium on System Theory, Tyler Texas, 335-339, March 2010
- Nikhil Satyala, Ron Pieper and Wudyalew Wondmagegn,, "Simulation and Transient Analysis of Organic/Inorganic CMOS Inverter Circuit," 41st IEEE Southeastern Symposium on System Theory, pp 324-329, Nashville Tenn., March 2009.
- R. Pieper D. Koslover and H. Ndwata, "Combining Phased Array Hamming Sound Apodization Techniques to Improve the Acousto-Optic Diffraction Bandwidth", 41st IEEE Southeastern Symposium on System Theory, page 311-316, Nashville Tenn., March 2009
- R. Pieper and N. Satyala, "Conditions for Gaussian Long Term Manufacturing Processes," 41st IEEE Southeastern Symposium on System Theory, Nashville, pp205-208, March 2009
- R. J. Pieper and Nikhil T. Satyala, "An improved Characterization for Predicting a Capability Index with Dependence on Manufacturing Target Bias", *40<sup>th</sup> IEEE Southeastern Symposium on System Theory*, New Orleans, pp. 113-117, March 2008
- Daniel Blair and R. J. Pieper "Observations on Message Transmission Using Rossler and Lorenz Chaos systems with PSPICE and MATLAB models", *40<sup>th</sup> IEEE Southeastern Symposium on System Theory*, pp. 69-73, March 2008
- Justin Fenley and R. Pieper, " A Quartic Solution Covering Freeze-out and Exhaustion Effects in P-Type compensated Semiconductors", *39<sup>th</sup> IEEE Southeastern Symposium on System Theory*, Macon Georgia, pp. 291-295, March 2007

### ***Significant Reports***

- R. Pieper and M. Quevedo-Lopez. "Final Executive Report: Center for Organic Semiconductor Modeling and Simulation (COSMOS ) 2007-2012" submitted 4/17/2013 to Dr. Eric Forsythe CIV (US), U.S. Army Research Laboratory, Adelphi MD, Contract W911NF-07, April 2013
- R. J. Pieper, "Bandwidth Analysis of Strong Interaction Acousto-Optic Devices", Ph.D thesis, under advisor Professor Adrian Korpel, University of Iowa, 1984
- R. Pieper, "A Study of Stresses in Silicon", Master's Project under advisor Professor Henry Guckel, University of Wisconsin (Madison). May 1976

### ***Honors and Awards***

University of Texas at Tyler, Office of Sponsored Research, "Certificate of Appreciation", Signed by Dr. Arlene Horne (Associate Vice President for Research), Dr. Richard Osborne (Provost and Vice President of Academic Affairs) and Dr. Rodney Mabry (President of the University of Texas at Tyler), February 2008.

“Best Professor of the Year in acknowledgement of a job well done” awarded by the University of Texas at Tyler, Engineering Student Association, for the academic year 2005-2006. Awarded April 2006

***Sponsored Research:***

“year 5: Center for Organic Semiconductor Modeling and Simulation” -December 2010, Proposal worked out in collaboration with VP of research and UTD Professor Bruce Gnade at University of Texas at Dallas,. Sponsor Army Research Labs, **\$126,503( funded)**, Contract W911NF-07, December 2012

“Year 4: Center for Organic Semiconductor Modeling and Simulation” -December 2010, Proposal worked out in collaboration with VP of research and UTD Professor Bruce Gnade at University of Texas at Dallas,. Sponsor Army Research Labs, **\$775,000( funded)**, Contract W911NF-07, December 2011

“Year 3: Center for Organic Semiconductor Modeling and Simulation” -May 2009, Proposal worked out in collaboration with VP of research and UTD Professor Bruce Gnade at University of Texas at Dallas,. Sponsor Army Research Labs, **\$1,024,683 ( funded)**, Contract W911NF-07, Sept 2010

“Year 2: Center for Organic Semiconductor Modeling and Simulation” -May 2009, Proposal worked out in collaboration with VP of research and UTD Professor Bruce Gnade at University of Texas at Dallas,. Sponsor Army Research Labs, **\$1,044,896 ( funded)**, Contract W911NF-07,May 2009

“Year 1: Center for Organic Semiconductor Modeling and Simulation” -May 2009, Proposal worked out in collaboration with VP of research and UTD Professor Bruce Gnade at University of Texas at Dallas,. Sponsor Army Research Labs, **\$1,580,000 ( funded)**, Contract W911NF-07,May 2008