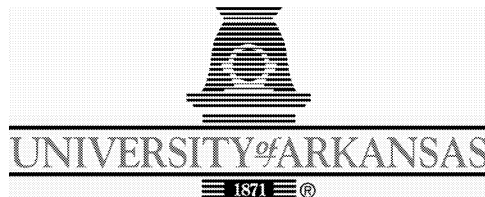




# 2007 IEEE Region 5 Technical Conference

April 20-21, 2007



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# Technical Conference Program and Papers

**Friday, April 20, 2007**

**Plenary Session**

**CCE Auditorium (204)**

**8:00 Welcome**

Vasundara V. Varadan, Technical Conference Chair  
 Chancellor John White, University of Arkansas – Fayetteville  
 Dan Coody, Mayor of Fayetteville  
 John Meredith, President, IEEE-USA  
 Robert Scolli, IEEE Region 5 Director  
 Edge Nowlin, IEEE Region 5 Conference Chair

**8:20 Plenary Lecture**

**Dr. Parag G. Patil, MD, Ph.D**

Department of Neurosurgery  
 University of Michigan Hospitals, Ann Arbor, MI  
*Brain – Machine Interfaces – Today and Tomorrow*

**Session 1: April 20, 2007, Friday AM Room: 410 CCE**

**Electromagnetic and Biomedical Systems I**

Session Chair: Magda Elshenawee, University of Arkansas – Fayetteville

9:30	1.1	Ultra wide-band transceiver architecture for early breast cancer detection system	1
		L.K. Hady, A.A. Kishk, University of Mississippi	
9:55	1.2	Effect of wave polarization on breast cancer detection	5
		D. Woten, M. El-Shenawee, J. Luth, University of Arkansas-Fayetteville	
10:40	1.3	Compact dielectric resonator antenna array for microwave breast cancer detection	9
		W. Huang, A.A. Kishk, University of Mississippi	
11:05	1.4	Computational model for breast cancer tumor growth	13
		S. Shummate, M. El-Shenawee, University of Arkansas-Fayetteville	
11:30	1.5	Adaptive tuning amplitude and phase estimation methods for early breast cancer detection	16
		S.W. Ryu, A.K. Ahmed, University of Mississippi	
11:55	1.6	A comparative study of diffraction tomography methods for breast cancer application	21
		M.R. Hajihashemi, M. El-Shenawee, University of Arkansas-Fayetteville	

**Session 2: April 20, 2007, Friday AM Room: 409 CCE**

**Nanostructure Materials and Devices I**

Session Chair: Vijay K. Varadan, University of Arkansas - Fayetteville

9:30	2.1	Incorporating metal nanoparticles in high-K dielectrics for nanoflash and nanoCMOS	25
		N.E. Islam, A.A. Pavel, P. Kirawanich, R. Ravindran, S. Gangopadhyay, University of Missouri Columbia	
9:55	2.2	Integrated system for wireless radiation detection and tracking	29
		R. Waguespack, S. Pellegrin, C.G. Wilson, Louisiana Tech University	
10:40	2.3	Nanofabric PLA architecture with flexible nanowire-redundancy	32
		M.V. Joshi, W. Al-Assadi, University of Missouri-Rolla	
11:05	2.4	Monolithic integration of heterojunction bipolar transistor (HBT) and grating-outcoupled surface emitting (GSE) laser	37
		W. Jones, S. McWilliams, C. Boehme, H. Zhu, P. Pinsukanjana, T. Masood, L. Jiang, V. Amarasinghe, M. Achtenhagen, G.A. Evans Southern Methodist University	
11:30	2.5	Si photonic for on chip optical interconnect and contactless logic testing. S. Sayil	42
		Lamar University	
11:55	2.6	Intersubband transitions in quantum well infrared photodetector	49
		J. Wu, B. Passmore, D. Zhuang, O. Manasreh, University of Arkansas-Fayetteville	

**Session 3: April 20, 2007, Friday AM Room: 405 CCE**

**Digital Circuits and Systems I**

Session Chair: Jia Di, University of Arkansas - Fayetteville

9:30	3.1	Implementation of Static and Semi-Static Versions of a Quad-Rail NCL 24+8x8 Multiply and Accumulate Unit S. Mallepalli, S. Kakarla, S. Burugapalli, S. Beerla, S. Kotla, P.K. Sunkara, W.K. Al-Assadi, S.C. Smith, University of Missouri-Rolla	53
9:55	3.2	NCL Implementation of 8 Bit Dual Rail Modified Booth Multiplier using Static and Semi-Static Primitives M.V. Joshi, S. Gosavi, V. Jagadeesan, A. Basu, S. Jaiswal, W. Al-Assadi, S. Smith University of Missouri-Rolla	59
10:40	3.3	A Hardware Threat Modeling Concept for Trustable Integrated Circuits J. Di, S. Smith, University of Arkansas-Fayetteville	65
11:05	3.4	Simulation Study on Traffic Control Performance in Combined Input and Cross Point Queuing Switches Q. Duan, S. Chin, University of Central Arkansas	69
11:30	3.5	Prefix Parallel Adder Virtual Implementation in Reversible Logic D.Y. Feinstein, M.A. Thorton, V.S.S. Nair, Southern Methodist University	74
11:55	3.6	Overflow Detection and Correction in a Fixed-Point Multiplier Arthurs, J. Di, University of Arkansas-Fayetteville	81

**Session 4: April 20, 2007, Friday AM Room: 411CCE**

**RF, Microwave, and Analog Circuits**

Session Chair: Len Schaper, University of Arkansas - Fayetteville

9:30	4.1	Radar Polarimetry for target discrimination C. Ibarra, O. Kegege, J. Li, H. Foltz, University of Texas- Pan American	86
9:55	4.2	A I-V quasi rail-to-rail operational amplifier with a single input differential pair M. Peng, W.A. Davis, H.T. Russell Jr., R.L. Carter, University of Texas-Arlington	93
10:40	4.3	Design consideration for the aperture design of atmospheric imaging radar C. Kidder, M. Yeary, R. Palmer, University of Oklahoma-Norman	97
11:05	4.4	Effect of via profile on copper seed layer deposition for electroplating I.U. Abhulimen, T. Lam, A. Kamto, S. Burkett, L. Schaper, L. Ca University of Arkansas-Fayetteville	102
11:30	4.5	Radar Absorbing Applications of Metamaterials V.V. Varadan, University of Arkansas-Fayetteville	105
11:55	4.6	Metamaterial Substrates For Automotive MM Wave Radar using LTCC Fabrication Methods I.K. Kim, V.V. Varadan, University of Arkansas-Fayetteville	109
12:20	4.7	RFIC Design Methodology: Functional Verification W. Dunham Cadence Co.	113

**Session 5: April 20, 2007, Friday AM Room: 402 CCE**

**Control Systems I**

Session Chair: Roy McCann, University of Arkansas - Fayetteville

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9:55	5.2	Experimental Procedures for Fluorescent Lifetime Measurements with Customized Embedded SDP Systems and Adaptive Algorithms. A. Arul, A. Snyder, R. Kelley, J. Meier, T. Hicks, M. Yeary, P. McCann, C. Roller. University of Oklahoma-Norman	124
10:40	5.3	Acoustical Signature Analysis for Cargo and Freight Security Monitoring Systems R. McCann, R. Chinnappareddy, University of Arkansas-Fayetteville	129
11:05	5.4	Artificial Neural Network-Based Estimation for Pseudomonas Aeruginosa Experiments A.C. Yarlagadda, N. Subramanian, A. Azghani, University of Texas-Tyler	133

11:30	5.5	Event-Based Measurement Updating Kalman Filter in Network Control Systems A.T. Le, R. McCann, University of Arkansas-Fayetteville	138
11:55	5.6	Flux Estimation in Switched Reluctance Motors Using a Two-Dimensional Least Squares Method, R. McCann, W.F. Traore, P. Marthala, University of Arkansas-Fayetteville A.C. Yarlagadda, N. Subramanian, A. Azghani, University of Texas-Tyler	142

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**Electromagnetic and Biomedical Systems II**

Session Chair: Kaiming Ye, University of Arkansas - Fayetteville

1:30	6.1	Physiological Cost Optimization for Sit-to-Stand Transfer K. Iqbal, University of Arkansas-Little Rock	147
1:55	6.2	Design of a compact amplifier and signal conditioning module for wireless EEG Monitoring ,A.K. Whitchurch, J.K. Abraham, V.K. Varadan, University of Arkansas-Fayetteville	153
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3:55	6.6	Development of a pH Insensitive Glucose Indicator for Continuous Glucose Monitoring J. R. Garrett, X. Wu, K. Ye, University of Arkansas-Fayetteville	171

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**Nanostructure Materials and Devices II**

Session Chair: Susan Burkett, University of Arkansas - Fayetteville

1:30	7.1	DC Characterization and validation of improved analytical model of AlGaIn/GaN HEMT H.F. Huq, S.K. Islam, University of Texas- Pan American	175
1:50	7.2	BER performance limitations of FBG-based bi-directional optical cross-connect S. Dey, University of Texas-Dallas	181
2:15	7.3	Nanowire integrated microelectrode arrays for neuroelectronic applications. J.K. Abraham, H. Yoon, V.K. Varadan, University of Arkansas-Fayetteville	185
3:05	7.4	Optical Emission Spectroscopy in a Reactive Ion Etching System Plasma diagnostic studies in reactive ion etch system. S.P. Koirala, M.H. Gordon, L. Cai, S.L. Burkett, L.W. Schaper University of Arkansas-Fayetteville	189
3:30	7.5	FEA Stress analysis of 3-D stack-up geometries D. Boyt, I. Abhulimen, M.H. Gordon, S. Burkett, L.Schaper, University of Arkansas-Fayetteville	194

**Session 8:** April 20, 2007, Friday PM      **Room: 405 CCE**

**Digital Circuits and Systems II**

Session Chair: Ghulam Chaudhry, University of Missouri – Kansas City

1:30	8.1	Effects of Electromagnetic Interference on Controller Area Network Performances F. Ren, Y.R. Zheng, A.G.Shuerman, University of Missouri-Rolla	199
1:55	8.2	Improvement of CAN Bus Controller By Using Error Correcting Codes K.C. Emani, K. Kam, Y.R. Zheng, M. Zawodniok, University of Missouri-Rolla	205
2:20	8.3	A Framework for Detection of Crosstalk Noise in FPGAs. S. Kakarla, W. Al-Assadi, University of Missouri-Rolla	211
3:05	8.4	Detecting Malicious Logic Through Structural Checking S.S. Smith, J. Di, University of Arkansas-Fayetteville	217

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		R. Sankar P., F. Kacani, R. Bonham, S. Mohan G., S. Kumar Ch., V. Kadiyala, W. Al-Assadi, S. Smith, University of Missouri-Rolla	
4:20	8.7	Variable Length Shift Select Shifter	234
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**Topics in Communications**

Session Chair: Ashok Srivastava, Louisiana State University

1:30	9.1	Precise Estimation of Crosstalk in Multiline Circuits	239
		S. Sayil, M. Rudrapati, U. Kiran, Lamar University	
1:55	9.2	Improving the Speed of a Class of Single Frequency Estimation Algorithm	246
		J.T. Reinking, Welkin Sciences, LLC	
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		M.A. Iqbal, S.L. Grant University of Missouri-Rolla	
3:05	9.4	Time-Domain Specification of Transformer-Coupled Transceivers	252
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**Power and Energy Systems**

Session Chair: Juan Balda, University of Arkansas - Fayetteville

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**Electromagnetic and Biomedical Systems III**

Session Chair: Sreekala Bajwa, University of Arkansas-Fayetteville

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9:25	11.2	Evaluation of a method-related model of adult respiratory impedance based.	303
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9:50	11.3	Quantum-dot based lateral flow strip assays for biomedical applications. J. V. Veetil <sup>1</sup> , M. Mehta <sup>2</sup> , A. Wang <sup>2</sup> , and K. Ye <sup>1</sup> , <sup>1</sup> University of Arkansas-Fay. <sup>2</sup> Ocean Nanotechnology, Inc	309
10:35	11.4	Image Authentication for Low Complexity Applications Low Complexity Image Authentication Algorithms for Mobile Applications W. Adi, A. Dawood, A. Mabrouk, S. M. Musa, Prarie View A&M University	314
11:00	11.5	Ground penetration radar using golay sequences H.U.R. Mohammed, D. Mohammed, New Mexico State University	318
11:25	11.6	Analysis of Rectangular Co-axial Lines S. M. Musa, M.N.O. Sadiku, Prarie View A&M University	322

**Session 12: April 21, 2007, Saturday AM Room: 209 CCE**

**Control Systems II**

Session Chair: Roy McCann, University of Arkansas – Fayetteville

8:00	12.1	Real Time Identification of Overinstrumented Systems L. Alvergue, X. Li, J.Aravena , Louisiana State University	326
8:50	12.2	Variable Structure Switching Controller L. Marinovici, J.L. Aravena, Louisiana State University	331
9:40	12.3	System Identification for a Model Based Observer Road Roughness Profiler R. McCann, S. Nguyen, University of Arkansas-Fayetteville	336

**Session 13: April 21, 2007, Saturday AM Room: 411 CCE**

**Digital Circuits and Systems III**

Session Chair: Scott Smith, University of Missouri-Rolla

8:30	13.1	An Investigation of the Design and Implementation Flaws of Information Systems Security Models N.L. Norfolk, University of Arkansas- Little Rock	344
8:55	13.2	An Approach to QoS-Based Grid Network Service Discovery Q. Duan, M. Talley, N. Seetha, University of Central Arkansas	350
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11:15	13.7	Analysis & modeling of crosstalk noise in domino CMOS circuits V. Sharma, W.K. Al-Assadi, University of Missouri-Rolla	374

**Session 14: April 21, 2007, Saturday AM Room: 304 CCE**

**Topics in Radio Frequency Identification**

Session Chair: Craig Thompson, University of Arkansas-Fayetteville

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10:35	14.4	Pocket-PC Asset Manager using RFID S. Crowl St. Edwards University	397
11:00	14.5	RFID Instrumentation in a Field Application S. Watkins, T.M. Swift, M.J. Molander, University of Missouri-Rolla	400
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**Session Poster:** Friday, April 20, 2007, 6:30 – 7:30 PM

Session Chairs: Kamesh Namuduri, Wichita State University, Vijay K. Varadan, University of Arkansas

**Room: Fayetteville Public Library**

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P.2		Demonstration of a flow through micro-PCR in an Annular Pyrex Channel M.H. Gordon, J.E. Mock, University of Arkansas-Fayetteville	415
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