

## PANAGIOTIS (PANOS) E. PAPAMICHALIS

Southern Methodist University  
P.O. Box 750338  
Dallas, TX 75275-0338  
Tel. +1 214 768-4905  
[panos@enr.smu.edu](mailto:panos@enr.smu.edu)

### RESEARCH INTERESTS

Digital signal processing and its applications in Image and Video processing, Speech and Audio processing, Biomedical signal processing and Communications.

### EDUCATION

Georgia Institute of Tech	Atlanta, GA	Ph.D.	1976-1980
Georgia Institute of Tech	Atlanta, GA	MSEE	1975-1976
National Tech Univ of Athens	Athens, Greece	Mech/Elec Engr	1967-1972

### POSITIONS HELD

**2003-Present**     **Southern Methodist University, Dallas**  
Professor, Electrical Engineering Department, School of Engineering. Taught courses on Digital Signal Processing, Image and Speech Processing. Research on Image Processing (Video coding; Error resilience of video signals using multiple description coding; Super-resolution; Color image processing), and Neuroengineering (Spike sorting)

**2003-2007**     **Southern Methodist University, Dallas**  
Department Chair, Electrical Engineering Department, School of Engineering. Led a Department of 15 faculty, 100 undergraduate students and 200 graduate students.

**2000-2003**     **Texas Instruments, Dallas**  
Director, Imaging & Audio Laboratory, DSP R&D Center, Dallas, Texas. Supervising R&D in support of imaging, video and high quality audio products. Coordinating with internal customers to identify directions of research. Interfacing with Universities (Georgia Tech, Rice) on sponsored research. Imaging/video work includes JPEG2000 implementation, H.26L research, MPEG4/H.263 implementations, transcoding. Audio implementations include WMA, MP3, MP3pro, AAC, MIDI.

**1997-2000**     **Texas Instruments, Japan**  
Director, Tsukuba R&D Center, Tsukuba Japan. Supervised 70 researchers and engineers on signal processing projects. Aligned research projects with the needs of TI product groups world-wide. Interfaced with and gave invited presentations to Universities in Japan. Projects included 3G cell phone designs; Video coding using the MPEG2 standard; Audio coding of standards on TI DSP devices.

**1990-1997**     **Texas Instruments, Dallas**  
TI Fellow and R&D Branch Manager. Led a team of researchers to investigate DSP Solutions on communications and high-quality-audio problems. Developed systems and designs on Cable Modems and DSL modems. Supervised work on MPEG Audio coding. Interfaced with product groups to implement the systems on chips.

**1992-1994**     **Southern Methodist Univ., Dallas**  
Adjunct Professor, EE Dept. Taught graduate courses on Speech Processing

**1990-1997**     **Univ. Texas, Dallas**  
Adjunct Professor, EE Dept. Taught graduate courses on Speech Processing

**1984-1990**     **Texas Instruments, Houston**  
Senior Member of Tech Staff and Section Manager. Worked on definition of Signal Processing Chips and on applications on digital signal processors. Applications included numerical algorithms, fast algorithms (such as FFT's), speech applications (LPC vocoders and synthesizers), image coding (JPEG standard), and encryption algorithms (DES). Supervised third parties in implementation of speech algorithms on the TMS320 devices. Presented DSP devices and their applications in short

courses (UCSB, DSP Assoc., NASA, IEEE video course). Interfaced with customers and TI field engineers to provide technical assistance through presentations, troubleshooting, and tutoring. Wrote articles for technical and trade magazines. Edited two volumes of application reports on the TMS320 Family. Coordinated the University support program of the DSP Department.

**1984-1990**

**Rice University, Houston**

Adjunct Professor, ECE Dept. Taught graduate courses on DSP and Speech Processing; Supervised students' special projects.

**1981-1984**

**Univ. Texas, Dallas**

Adjunct Professor, CS Dept. Taught Computer Science and Math courses.

**1980-1984**

**Texas Instruments, Dallas**

Member of Tech. Staff. Conducted research on low bit rate speech coding using various LPC parameters, and on the evaluation of speech coder performance. Organized several internal workshops on speech technology.

### **ACTIVITIES, AWARDS, MEMBERSHIPS**

- IEEE Fellow (1999)
- TI Fellow (1995)
- President, IEEE Signal Processing Society (2000-01)
- IEEE Third Millennium Medal recipient (2000)
- Meritorious Service Award, IEEE Signal Processing Society (1996).
- Registered Professional Engineer in Texas (2004)
- TI Senior Member of Technical Staff (1987)
- TI Member of Group Technical Staff (1985)
- President-Elect, IEEE Signal Processing Society (1998-99)
- Vice President - Conferences, IEEE Signal Processing Society (1993-96).
- Chairman, Conference Board, IEEE Signal Processing Society (1990-96).
- Distinguished Lecturer of the IEEE Signal Processing Society (1989).
- General Chairman of the 1987 IEEE International Conf. on Acoustics, Speech, and Signal Proc. in Dallas.
- Founder and past chairman of the IEEE Signal Processing chapter of the Dallas section of IEEE (1982-84)
- Award for outstanding service to the IEEE Signal Processing Society, Dallas Section (1985, 2006)
- Member, DFW Semiconductor Executive Council (2005-2007)
- Advisory member to the IEICE Transactions (Japan) (2000-present)
- Member of the IEEE Jack S. Kilby Medal (2002-2004)
- Member of the IEEE TAB Nominations & Appointments committee (2002-2003)
- Member of Advisory Board, SMU EE Dept (2001-2002)
- Member of selection committee for TI Fellowships, Rice Univ. EE Dept (1997-2003)
- Member of the TIA committee TR30.1 (modem standardization) (1995-97)
- Member of T1E1.4 committee (ADSL standardization) (1993-96)
- Member of the Technical Chamber of Greece
- Member of Sigma Xi

- Member of HKN

## **PATENTS**

1. P. E. Papamichalis and G. R. Doddington, "Encoding of the LPC Model Poles for Speech Signals" (US Patent No. 4,536,886 issued on August 20, 1985).
2. P. E. Papamichalis and G. R. Doddington, "Time Encoding of LPC Parameters of Speech Signals" (US Patent No. 4,625,286 issued on November 25, 1986).
3. G. R. Doddington and P. E. Papamichalis, "Speech Analysis/Synthesis System with Energy Normalization and Silence Suppression" (US Patent No. 4,696,040 issued on September 22, 1987).
4. P. E. Papamichalis, "Markov-Huffman Coding of LPC parameters" (US Patent No. 4,718,087 issued on January 5, 1988).

## **BOOKS AND BOOK CHAPTERS**

1. P. E. Papamichalis, "Practical Approaches to Speech Coding", Prentice-Hall, Inc., 1987.
2. P.E. Papamichalis, Ed., "Digital Signal Processing Applications with the TMS320 Family", Vol. 2, Texas Instruments, 1990 and Prentice-Hall, 1991.
3. P.E. Papamichalis, Ed., "Digital Signal Processing Applications with the TMS320 Family", Vol. 3, Texas Instruments, 1990 and Prentice-Hall, 1991.
4. P. E. Papamichalis and Robert Kerwin, Eds., "Digital Signal Processing Technology", SPIE Optical Engineering Press, 1995.
5. P.E. Papamichalis, "TI Family of DSP Processors", in DIGITAL SIGNAL PROCESSING HANDBOOK, V. Madisetti and D. Williams, CRC/IEEE Press, 1997

## **PUBLICATIONS AND REPORTS**

1. Y. Ghanbari, P. Papamichalis, L. Spence, "Robustness of Neural Spike Sorting to Sampling Rate and Quantization Bit Depth", DSP 2009 International Conference, Santorini, Greece, July 2009
2. N. El-Yamany, P. Papamichalis, "Using bounded-influence M-estimators in multiframe super-resolution reconstruction: a comparative study", IEEE 2008 Intl Conf. on Image Processing (ICIP 2008), pp. 337-340, San Diego, October 2008
3. N. El-Yamany, P. Papamichalis, M. Christensen "An Adaptive Framework for Robust High-Resolution Image Reconstruction in Multiplexed Computational Imaging Architectures", Applied Optics, Vol 47, No 10, pp. B117-B127, April 2008
4. N. El-Yamany, P. Papamichalis, "Robust Color Image Super-Resolution: An Adaptive M-Estimation Framework", EURASIP Journal on Image and Video Processing, Volume 2008 (2008), Article ID 763254, 12 pages
5. N. El-Yamany, P. Papamichalis, "An adaptive M-estimation framework for robust image super-resolution without regularization", SPIE Symposium on Electronic Imaging, Vol. 6822, pp. D-1 to D-12, San Jose, January 2008
6. N. El-Yamany, P. Papamichalis, W. Schucany, "A Robust Image Super-Resolution Scheme Based on Redescending M-Estimators and Information-Theoretic Divergence", IEEE

International Conference on Acoustics, Speech, and Signal Processing, pp. I-741 – I-744, Hawaii, April 2007.

7. P. Rangarajan, P. Papamichalis, "Detail-Preserving Contrast Reduction for Digital Cameras", to appear, IEEE International Conference on Image Processing, pp. 2285-2288, Atlanta, October 2006.
8. S. Kizhakkemadam, P. Papamichalis, M. Srinath, D. Rajan, "Tradeoff Between Source and Channel Coding for Erasure Channels", Proc. of the 2005 IEEE Intl. Symposium on Information Theory, pp.1661-1665, September 2005.
9. P. Papamichalis, "Multiple Description of Video and Some Applications to Error Resilience", (Invited), Proceedings of 2<sup>nd</sup> Intl Symposium on System Construction of Global-Network-Oriented Information Electronics, pp. 39-42, Sendai, Japan, Jan 31- Feb 1 2005
10. A. Gatherer, P. Papamichalis, "Scattered Lookahead without Finding Polynomial Roots or Solving Simultaneous Equations", IEEE Trans. on Signal Processing, pp. 2415-2418, September 1999.
11. P. Papamichalis, Ed., "DSP Solutions", Special Issue of the Texas Instruments Technical Journal, Vol. 13, No. 2, March-April 1996. Also in that issue: Gene Frantz and P. Papamichalis, "Introduction to DSP Solutions", pp. 5-16.
12. P. Papamichalis, "MPEG Audio Compression: Algorithms and Implementation", DSP95 Intl. Conf. on DSP, pp. 72-77, June 1995.
13. P. Papamichalis, J. Reimer, J. Rowlands, "System and Algorithm Implementation Techniques on the TMS320 Family", Proc. of the 1995 IEEE Int. Conf. on Acous., Speech, and Signal Proc., May 1995.
14. S. Oh, V. Viswanathan, P. Papamichalis, "Hands-Free Voice Communication in an Automobile With a Microphone Array," Proc. of the 1992 IEEE Int. Conf. on Acous., Speech, and Signal Proc., pp. I-281 to I-284, March 1992.
15. P.E. Papamichalis, DSP Expert Column, Personal Engineering and Instrumentation News, January, March, May, July, September, and November 1990 issues.
16. P.E. Papamichalis, "High Quality Speech Coding: Some Recent Algorithms," Proc. of SPEECHTECH 89, pp. 329-333, May 1989.
17. J. DellaMorte and P.E. Papamichalis, "Full-Duplex Real-Time Implementation of the FED-STD-1015 LPC-10e Standard V.52 on the TMS320C25," Proc. of SPEECHTECH 89, pp. 218-221, May 1989.
18. P.E. Papamichalis and C.S. Burrus, "Conversion of Digit-Reversed to Bit-Reversed Order in FFT Algorithms," Proc. of the 1989 IEEE Int. Conf. on Acous., Speech, and Signal Proc., pp. 984-987, May 1989.
19. P.E. Papamichalis, "Application, Progress and Trends in Digital Signal Processing," Proc. of Mikrolektronik Conf., Baden-Baden, March 1989.
20. P.E. Papamichalis and Ray Simar, Jr., "The TMS320C30 Floating-Point Digital Signal Processor," IEEE Micro Magazine, pp. 13-29, December 1988.
21. P.E. Papamichalis, "Impact of DSP Devices on Fast Algorithms," Proc. of the 1988 IEEE DSP Workshop, September 1988.
22. P.E. Papamichalis, "FFT Implementation on the TMS320C30," Proc. of the 1988 IEEE Int. Conf. on Acous., Speech and Signal Proc., pp. 1399-1402, April 1988.
23. P.E. Papamichalis and D. Lively, "Implementation of the DoD Standard LPC-10/52E on a TMS320C25," Proceedings of SPEECHTECH 87, pp. 201-204, April 1987.
24. P.E. Papamichalis and J.B. Reimer, "Implementation of the Data Encryption Standard Using the TMS32010," in the book Digital Signal Processing Applications with the TMS320 Family, K.-S. Lin (Ed.), Texas Instruments Inc., 1986.

25. P.E. Papamichalis and J. So, "Implementation of Fast Fourier Transform (FFT) Algorithms with the TMS32020," in the book *Digital Signal Processing Applications with the TMS320 Family*, K.-S. Lin (Ed.), Texas Instruments Inc., 1986.
26. P.E. Papamichalis and J.B. Reimer, "Speech Encryption Using the DES on a TMS32010," *Proc. of IEEE Globecom '85 Conf.*, pp. 817-821, December 1985.
27. P. E. Papamichalis, "Markov-Huffman Coding of LPC Parameters," *IEEE Trans. on Acoustics, Speech, and Signal Processing*, Vol. ASSP-33, pp. 451-453, April 1985.
28. P. E. Papamichalis, "Bit rate reduction by Markov-Huffman Coding of LPC Parameters," 1985 *IEEE Intern. Conf. on Acoustics, Speech, and Signal Proc.*, pp. 268-271, March 1985.
29. P. E. Papamichalis and G. R. Doddington, "A Speaker Recognizability Test", 1984 *IEEE Intern. Conf. on Acoustics, Speech, and Signal Proc.*, pp. 18B.6.1-4, March 1984.
30. P. E. Papamichalis and G. R. Doddington, "A Speaker Recognizability Test for Communications Systems", *Journal Acous. Soc. Am.*, Paper BB3, p. S50, Suppl. 1, Vol. 74, Fall 1983
31. P. E. Papamichalis and T. P. Barnwell, III, "Variable Rate Speech Compression by Encoding Subsets of the Parcor Coefficients," *IEEE Transactions on Acoustics, Speech, and Signal Processing*, Vol. ASSP-31, No. 3, pp. 706-713, June 1983.
32. P. E. Papamichalis and G. R. Doddington, "Delta Coding of LPC Parameters," 1983 *IEEE Intern. Conf. on Acoustics, Speech, and Signal Proc.*, pp. 85-88, April 1983.
33. P. E. Papamichalis and G. R. Doddington, "Time Encoding of LPC Roots," 1982 *IEEE Intern. Conf. on Acoustics, Speech, and Signal Proc.*, pp. 589-592, May 1982.
34. P. E. Papamichalis and T. P. Barnwell, III, "A Dynamic Programming Approach to Variable Rate Speech Transmission," 1980 *IEEE Intern. Conf. on Acoustics, Speech, and Signal Proc.*, pp. 28-31, April 1980.
35. E. Reiner, L. E. Abbey, T. F. Moran, P. Papamichalis, and R. W. Schafer, "Characterization of Normal Human Cells by Pyrolysis Gas Chromatography Mass Spectrometry," *Biomedical Mass Spectrometry*, Vol. 6, No. 11, pp. 491-498, November 1979.
36. P. E. Papamichalis and T. P. Barnwell, III, "LPC Analysis Using a Variable Acoustic Tube Model," 1979 *IEEE Intern. Conf. on Acoustics, Speech, and Signal Proc.*, pp. 731-734, April 1979.
37. T. P. Barnwell, III, P. E. Papamichalis, and J. D. Marr, "Very Low Bit Rate Speech Compression," Final Report E21-675, NSF Grant ENG76-02029, Georgia Institute of Technology, November 1978.

#### **GRADUATE STUDENT SUPERVISION**

- Prasanna Rangarajan (Ph.D. candidate)
- Yasser Ghanbari (Ph.D. candidate)

#### **TEACHING**

- EE 5374/7374 Digital Image Processing (Summer 2006, Fall 2008)
- EE 3372: Introduction to Digital Signal Processing (Fall 2008, Spring 2009)
- EE 2370: Design and Analysis of Signals and Systems (Spring 2006)
- EE 8373: Digital Speech Processing (Spring 2004, 2007, 2009)
- EE 5372/7372: Digital Signal Processing (Fall 2004)
- EE 2381: Digital Computer Logic (Fall 2006)

- SS 1101: Engineering and Beyond (Fall 2003, 2004, 2005, 2006)