ROBERT E. MORLEY, JR.

Electrical and Systems Engineering Department, Box 1127 (314) 935-5067
Washington University, St. Louis, MO 63130

EDUCATION

D. Sc. in Electrical Engineering - Washington University (1977)
MS in Electrical Engineering - Washington University (1975)
BS in Electrical Engineering - Washington University (1973)

ACADEMIC CAREER

Associate Professor of Electrical Engineering at Washington University in St. Louis since 4/87.
Assistant Professor of Electrical Engineering at Washington University in St. Louis 9/81 through 3/87.

Courses taught include: ESE 498 - Senior Design Projects, ESE 435 Electrical Energy Laboratory (redesigned course), ESE488 - Signals and Systems Laboratory; EE455 - Digital Systems Laboratory and Assembly Language Programming (redesigned course); EE421 - Communication Theory, EE463 - Introduction to VLSI Design, EE 563 - Advanced VLSI Design Projects, EE360 - Logic and Digital Systems Design, EE147 - Introduction to Computer Systems (created course), EE445 - Digital Signal Processing, and various EE400 - Independent Study projects, EE350 Intermediate Electronics Lab, EE 250 - Introductory Electronics Lab, EE 100 - Introduction to Electrical Engineering (created course).

INDUSTRIAL CAREER

Cofounder and vice-president of Micro-Term, Inc. manufacturer of microprocessor based video display terminals (1976-1981). Responsibilities included hardware and software design of numerous products and testing devices, development of documentation standards, technical marketing and training of in-house and field-service technicians. Products included the first terminals emulating multiple low-end units, and C-Phone deaf communication terminals.

MIT Lincoln Laboratories (Summer 1975): Member of Technical Staff in satellite communications group. Designed a receiver to combat the effects of intersymbol interference. Simulated the receiver to verify a power savings of 3 dB for constant bit error rate.

ABB Hafo, Stockholm Sweden, (Summer 1993): Conducted feasibility study for low power VLSI design of a digital hearing aid in the Sig3 CMOS process.

National Acoustics Laboratory, Sydney Australia, (Summer 1994): Signal processing for enhanced hearing aids.

PUBLICATIONS

R. E. Morley, Jr., and D. L. Snyder, "Maximum Likelihood Sequence Estimation for Randomly Dispersive Channels," IEEE Transactions on Communications COM-27, No. 6, June 1979.

R. E. Morley, Jr., A. M. Engebretson, and J. G. Trotta, "A Multiprocessor Digital Signal Processing System for Real-Time Audio Applications," IEEE Transactions on Acoustics, Speech and Signal Processing ASSP-34, No. 2, April 1986.

"Hearing Aid Design" in "Handbook of Biomedical Engineering," Jacob Kline editor, Academic Press, 1988.

R. E. Morley, Jr., and D. L. Snyder, "Maximum Likelihood Sequence Estimation for Randomly Dispersive Channels," Proceedings of the Fourteenth Annual Allerton Conference on Circuit and System Theory, September 1976.

R. E. Morley, Jr., and D. L. Snyder, "Maximum Likelihood Sequence Estimation for Randomly Dispersive Optical Communication Channels," International Symposium on Information Theory, 1977.

A. M. Engebretson, R. E. Morley, Jr., and G. R. Popelka, "A Unified Digital Hearing Aid Design and Fitting Procedure," American Speech-Language-Hearing Association, 1983.

G. R. Popelka, A. M. Engebretson, and R.E. Morley, Jr., "Clinical Advantages of a Digital Hearing Aid," American Speech-Language-Hearing Association, 1983.

R. E. Morley, Jr., J. G. Trotta, and A. M. Engebretson, "A Digital Hearing Aid Simulator," Proceedings of MAECON, 1984.

A. M. Engebretson, R. E. Morley, Jr., and M. P. O'Connell, "A Wearable, Pocket-Sized Processor for Digital Hearing Aid and Other Hearing Prostheses Applications," Proceedings of ICASSP, 1986.

A. M. Engebretson, R. E. Morley, Jr., G. L. Engel, and M. P. O'Connell, "The Development of Devices for the Hearing-Impaired, A Progress Report: Part 1," Proceedings of the IEEE ASSP Workshop on Applications of Signal Processing to Audio and Acoustics, New Paltz, New York, September 15-17, 1986.

R. E. Morley, Jr., A. M. Engebretson, G. L. Engel, and M. P. O'Connell, "The Development of Devices for the Hearing-Impaired, A Progress Report: Part 2," Proceedings of the IEEE ASSP Workshop on Applications of Signal Processing to Audio and Acoustics, New Paltz, New York, September 15-17, 1986.

R. E. Morley, Jr., A. M. Engebretson, G. L. Engel, and M. P. O'Connell, "A Wearable, Digital Hearing Aid for Field Studies," Proceedings of the 39th Annual Conference on Engineering in Medicine and Biology, Baltimore, MD September 1986.

R. C. Barrett, A. W. McCarthy, M. I. Miller, and R. E. Morley, "Gaussian Convolutions on a Massively Parallel Processor," Proceedings of the Twenty-First Annual Conference on Information Sciences and Systems, pp. 373-374, The Johns Hopkins University, Baltimore, MD, March 1987.

R. E. Morley and T. J. Sullivan "A Massively Parallel Systolic Array Processor System," International Conference on Systolic Arrays, San Diego, CA May 1988.

R. E. Morley, G. L. Engel and T. J. Sullivan, "VLSI Based Design of a Battery Operated Digital Hearing Aid," Proceedings of ICASSP, New York, April 1988.

R. E. Morley, G. E. Christensen, T. J. Sullivan and O. Kamin, "The Design of a Bit-Serial Coprocessor for a Massively Parallel SIMD Processor," Proceedings of the Second Symposium on the Frontiers of Massively Parallel Computation, George Mason University, Fairfax VA, October 1988.

R. E. Morley, G. E. Christensen and T. J. Sullivan, "The Design of a Bit-Serial Coprocessor to Perform Multiplication and Division for a Massively Parallel Architecture," International Conference on Systolic Arrays, Killarney, Ireland, May 1989.

G. R. Popelka, E. M. Causevic, R. E. Morley, and A. R. Ellsworth, “Spectral content of noise from isolated sources during distortion product otoacoustic emissions measurements.” ARO Abstracts, 22, 1999.

G. Popelka, E. Causevic, R. Krohn, R. Morley, M. Wickerhauser, J. Zhao, and R. Walden, “Interaction of environmental noise, measurement type and digital signal processing for universal neonatal auditory screening.” ARO Abstracts, 23, 2000.

E. J. Richter, R. E. Morley, W. F. Pickard, K. S. Maluf, J. W. Klaesner, and M. J. Mueller, “In-Shoe Multisensory Data Acquisition,” the joint annual conference of the Biomedical Engineering Society and Engineering in Medicine and Biology Society, Atlanta, GA, October, 1999.

K. S. Maluf, E. J. Richter, R. E. Morley, J. W. Klaesner, and M. J. Mueller, “Validity of measurements obtained from an electronic monitoring system in diabetic footwear” (Abstract). J Orthopedic Sports Physical Therapy 2000; 30: A12.

Seh Wah Kwa, Engel, G. L., Morley, R. E., “Quantization noise analysis of sign/logarithm data encoders when excited by speech or sinusoidal inputs.” IEEE Transactions on Signal Processing, Vol. 48 No. 12, December 2000.

R. E. Morley, E. J. Richter, J. W. Klaesner, K. S. Maluf, and M. J. Mueller, “In-Shoe multisensory data acquisition system.” IEEE Transactions on Biomedical Engineering, Vol. 48, NO. 7, July 2001.

Maluf KS, Morley RE, Richter EJ, Klaesner JW, Mueller MJ. Monitoring in-shoe plantar pressures, temperature, and humidity: reliability and validity of measures from a portable device. *Archives of Physical Medicine And Rehabilitation*. 2001;82:1119-27.

Maluf KS, Morley RE, Richter EJ, Klaesner JW, Mueller MJ. Foot pressures during level walking are strongly associated with pressures during other ambulatory activities in subjects with diabetic neuropathy. *Archives of Physical Medicine and Rehabilitation*. 2004;85:253-260.

X. F. Yang, D. W. Duffy, R. E. Morley, S. M. Rothman. “Neocortical seizure termination by focal cooling: temperature dependence and automated seizure detection.” Epilepsia. 2002 March; 43(3): pp. 240-245.

Roger Chamberlain, Yen Hsiang Chew, Varuna DeAlwis, Eric Hemmeter, John Lockwood, Robert Morley, Ed Richter, Jason White, and Huakai Zhang, "Novel Numerical Representations for Low-Power Audio Signal Processing," in Proc. of International Hearing Aid Research Conference, August 2002.

Roger Chamberlain, Yen Hsiang Chew, Varuna DeAlwis, Eric Hemmeter, John Lockwood, Robert Morley, Ed Richter, Jason White, and Huakai Zhang, "Power Consumption of Customized Numerical Representations for Audio Signal Processing," in Proc. of 6th High Performance Embedded Computing Workshop, September 2002.

Roger Chamberlain, Eric Hemmeter, Robert Morley, and Jason White, "Modeling the Power Consumption of Audio Signal Processing Computations Using Customized Numerical Representations." Proc. of 36th Annual Simulation Symposium, April 2003.

Deepak Srinivasagupta, Babu Joseph, and Robert Morley. “New in Situ Sensor Modeling Approach to Measurement Validation.”Industrial & Engineering Chemistry Research 2003, 42(11), pp. 2324-2333.

K. S. Maluf, R. E. Morley, E. J. Richter, J. W. Klaesner, and M. J. Mueller, “Foot pressures during level walking are strongly associated with pressures during other ambulatory activities in subjects with diabetic neuropathy.” Archives of Physical Medicine and Rehabilitation, Volume 85, Issue 2, February 2004, pp. 253-260.

Elvir Causevic, Robert Morley, M. Victor Wickerhauser, and Arnaud E. Jacquin, “Fast Wavelet Estimation of Weak Biosignals.” IEEE Transactions on Biomedical Engineering, Vol. 52, No. 6, June 2005, pp. 1021-1032.

TECHNICAL REPORTS

"Computer-Aided Communication Satellite System Analysis and Optimization," Report No. R(T)- 73/2 with T. Stagl et al., Center for Development Technology, Washington University, St. Louis, 1973.

"Alternative Communication Network Designs for an Operational PLATO IV CAI System," Report No. R(T)-75/3, with L. F. Eastwood, Center for Development Technology, Washington University, St. Louis, 1975.

"Feasibility of Implementing a Digital Hearing Aid in the Hafo SIG3 Process," R. E. Morley, August 1993.

PATENTS

1. "Hearing aids, signal supplying apparatus, systems for compensating hearing deficiencies, and methods." With A. M. Engebretson and G. R. Popelka. U.S. Patent No. 4,458,082, October 22, 1985.

2. "Electronic filters, signal conversion apparatus, hearing aids and methods." With A.M. Engebretson, G. L. Engel and T. J. Sullivan. U.S. Patent No. 5,111,419, May 5, 1992.

3. "Electronic filters, signal conversion apparatus, hearing aids and methods". With A.M. Engebretson, G. L. Engel and T. J. Sullivan. U.S. Patent No. 5,357,251, October 18, 1994.

4. "Electronic filters, repeated signal charge conversion apparatus, hearing aids and methods." With A.M. Engebretson, G. L. Engel and T. J. Sullivan. U.S. Patent No. 5,225,836, July 6, 1993.

5. "Method and Apparatus for Fingerprinting and Authenticating Various Magnetic Media," with R. S. Indeck and M. W. Muller. U.S. Patent No. 5,920,628, July 6, 1999.

6. “Magnetic stripe card verification system,” with T. C. McGeary and R. S. DeLand, Jr. U.S. Patent No. 6,098,881, August 8, 2000.

7. “Magnetic stripe card verification system,” with T. C. McGeary and R. S. DeLand, Jr. U.S. Patent No. 6,431,445, August 13, 2002.

8. “Magnetic stripe card verification system,” with R. S. DeLand, Jr. U.S. Patent No. 6,899,269, May 31, 2005.

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