

Biographical Sketch

P.A. (Rama) Ramamoorthy, Professor, Dept. of Electrical & Computer Engineering and Comp. Science,
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Education

Ph.D. University of Calgary, Alberta, Canada, 1977
M.S.EE. Indian Institute of Tech., Madras, India, 1973
B.S.E.E. College of Engineering, Guindy, University of Madras, India, 1971

Employment History

Prof. ECE. University of Cincinnati, Ohio, 1982-todate
**Program Director, Circuits and Signal Processing Program,
National Science Foundation, Washington, D.C., Jan, 1989- Dec. 1990**
Avionics Lab., Wright Patterson Air Base, Dayton, Ohio, USAF SFF, 1988
Rome Air Dev. Center, Rome, NY, USAF Summer Faculty Fellow, 1987
NASA Lewis Research Center, Cleveland, OH, SFF, 1984, 1985
Prof. ECE. Wayne State University, MI., 1981-1982
Visiting Prof., Georgia Institute of Technology, summer 1980
Prof. ECE. Western New England College, MASS., 1979-1981
Post-Doc Fellow & Research Engineer, University of Calgary, Canada, 1977-1979

Consulting Work (Past and Present)

Digital Signals & Systems Specialists, Inc., Owner and PI, A consulting Company, Cincinnati, OH.
M.B. Electronics, Consultant - Speech Research Group
General Electric Aircraft Engines Group
Cincinnati Electronics
Digital Equipment Corporation (Short course on Microprocessors)
Zonic Corporation, Cincinnati, Ohio.

Current Research Interests

Nonlinear and adaptive systems, multimedia software for education, Neural Networks for signal processing, fuzzy expert systems and neuro-fuzzy architectures for intelligent control and signal processing, applications of signal processing, optical signal processing and optical computing.

Teaching Interests & Expertise

I have interest in / taught a wide range of UG & graduate level courses in both Electrical & Comp. Engineering (Circuit Analysis, Digital Design, Computer Architecture & Organization, Microprocessor Systems, VLSI Design, Digital Signal, Speech, and Image Processing, Analog & Digital Communication, Nonlinear & Adaptive Systems, Optical Computing and Neural Networks). Played a key role in establishing an ABET accredited program in Comp. Engineering at UC & WNEC; Was Group Leader for Graduate Program in Signal Processing and Communications, Graduate Program Coordinator for Computer Engineering, and Graduate Program Director. Currently serve as Associate Editor for the Journal of *Dynamics of Continuous, Discrete and Impulsive Systems*.

Recent Presentations

Nonlinear and Adaptive Signal Estimation, Midwest Symp. on Circuits and Systems, July 2005.
A Building Block Approach for Designing Nonlinear and Time-Varying Adaptive Systems: Application in Self-Synchronous Chaotic Systems for Secure Communication, An invited presentation, Center for Chaos Control and Synchronization, City University of Hong Kong, Hong Kong, Nov. 4, 2003.
A Building Block Approach for Designing Nonlinear & Time-Varying (Adaptive) Systems, An invited presentation, National University of Singapore, Singapore, Aug. 22, 2003.

Books / Book Chapters

P.A. Ramamoorthy, *Nonlinear and Adaptive (Intelligent) Systems: Analysis, Modeling and Design – A Building Block Approach*, Textbook / research monograph, Dec. 2002. An electronic copy is available free of cost from the author.

P.A. Ramamoorthy and L.T. Bruton, *Design of stable two-dimensional analogue and digital filters with applications in image processing*, in *Selected Papers in Multidimensional Digital Signal Processing*, IEEE Press, 1986.

P.A. Ramamoorthy and L.T. Bruton, *Design of Two-Dimensional Recursive Filters*, "Chapter 3 in *Two-Dimensional Digital Signal Processing*, T.S. Huang ed., Springer-Verlag, Jan. 1981.

Refereed Publications (Partial list, arranged according to various topics; Total of \approx 100 in refereed Journals and conference proceedings)

A. Nonlinear and Adaptive Systems:

P.A. Ramamoorthy, "Adaptive Systems: A Building Block Approach & Application in Control of Uncertain Mechanical Systems Subjected to Disturbance," To be submitted for publication (electronic copy available on request).

P.A. Ramamoorthy, "Nonlinear and Time-varying Systems Analysis, Design, & applications: A Building Block Approach," For submission to IEEE Circuits and Systems Magazine

P.A. Ramamoorthy, "Chaotic Dynamics, Chaos Synchronization, State Estimation, and Interpretation using Electrical Elements & Circuits," *Asia-Pacific Workshop on Chaos Control and Synchronization*, July, 2004, Melbourne, Australia. Also in *Dynamics of Continuous, Discrete and Impulsive Systems*, Oct. 2005.

P.A. Ramamoorthy "A Building Block Approach for Self-Synchronous Chaotic System (SES) Design, *Dynamics of Continuous, Discrete and Impulsive Systems, Series B*, pp. 94-103, Nov. 2004.

P.A. Ramamoorthy, "A Building Block Approach For Designing Self-Synchronous Chaotic Systems and Application in Secure Communication," *Second Asia-Pacific Workshop on Chaos Control and Synchronization*, Nov. 6-7, 2003, Shanghai, China.

P.A. Ramamoorthy, Nonlinear Signal Processor Design: A Building Block Approach, *Proc. IEEE Intl. Symp. Circuits & Systems*, 1999.

P.A. Ramamoorthy and A. Zavaljevski, "Nonlinear Signal Processing Vs Kalman Filtering," *Proceedings IEEE Intl. Symp. Circuits and Systems*, May 3-6, 1993.

P.A. Ramamoorthy, Shi Zhang, Chen Fubao, & D. Ramachandran, "A new paradigm for the design of nonlinear dynamical systems & self-learning systems, *Proceedings Intl. Symp. Intelligent Control*, Aug. 25-27, 1993.

B. VLSI Architectures for Signal / Image Processing:

P.E. Pace, P.A. Ramamoorthy and D. Styer, "A Preprocessing Architecture for Resolution Enhancement in High-Speed Analog-to-Digital Converters," *IEEE Trans. Circuits & Systems, II: Analog & Digital Signal Processing*, Vol. 41, No. 6, pp. 373-379, 1994.

P.A. Ramamoorthy, B. Potu and T. Tran, "Bit-Serial VLSI Implementation of Vector Quantizer for Real-Time Image Coding," *IEEE Trans. Circuits & Systems*, Vol. 36, No. 10, Oct. 1989.

C. Optical Signal Processing and Computing:

P. Pace, P.A. Ramamoorthy and D. Styer, "High-Resolution Techniques for Guided-Wave Analogue-Digital Converters", *Electronics Letters*, Nov. 1992.

P.A. Ramamoorthy and S. Antony, "Optical implementation of systolic FIR filters," *Optical Engineering*, 1987.

P.A. Ramamoorthy and S. Antony, "Optical MSD adder using polarization coded symbolic substitution," *Optical Engineering*, 1987.

D. Neural Networks / Fuzzy Logic / Learning systems:

P.A. Ramamoorthy, "A Unified Approach for Designing Intelligent System Architectures," *Intl. Conf. Intelligent Systems & Workshop on Architectures for Semiotic Modeling and Situation Analysis in Large Complex Systems*, 1995.

P.A. Ramamoorthy & Yawed Hun, "Design of Stable Recurrent/Feedback Fuzzy Logic Controllers," *Proc. IEEE Intl. Conf. Fuzzy Systems*, 1994.

P.A. Ramamoorthy, "Recurrent Neural Architectures from Passive Nonlinear Electrical Building Blocks," *Proceedings IEEE Intl. Conf. Neural Networks*, 1994.

P.A. Ramamoorthy, "A unified approach for designing nonlinear dynamical systems (including neural & fuzzy systems) and self-learning systems," *Proceedings Intl. Fuzzy Systems and Intelligent Controls Conf.* March 13-16, 1994.

P.A. Ramamoorthy, "Design of recurrent neural / fuzzy systems: A building block approach," Plenary address, *Proceedings. Artificial neural networks in Engineering*, Nov. 14-17, 1993

P.A. Ramamoorthy and S. Huang, "Design of Stable Fuzzy-Logic Controlled Feedback Systems", *Proceedings IEEE Intl. Conf. on Fuzzy Systems*, March 28-April 1, 1993.

G. Govind and P.A. Ramamoorthy, "A Time-Evolving Neural Architecture and Algorithm for Nonlinear Control", *Proceedings Intl. Fuzzy Systems and Intelligent Control Conference*, March 1992.

E. Digital Signal Processing (modeling, adaptive, applications):

P.A. Ramamoorthy and P. Pace, "Digital signal processing and filter synthesis concepts for applications in spectroscopy: A tutorial", Invited paper, *Spectroscopy Journal*, June 1990

P.A. Ramamoorthy, & V. Iyer, Adaptive filtering in biological signal processing, Invited paper, *Critical Reviews in Biomedical Engineering*, CRC Press, Inc., April 1990.

F. Multi-dimensional Digital Signal Processing:

P.A. Ramamoorthy and L.T. Bruton, "Design of stable two-dimensional analogue and digital filters with applications in image processing," in *Selected Papers in Multidimensional Digital Signal Processing*, IEEE Press, 1986.

P.A. Ramamoorthy and L.T. Bruton, "Design of Two-Dimensional Recursive Filters," *Chapter 3 in Two-Dimensional Digital Signal Processing*, T.S. Huang ed., Springer-Verlag, Jan. 1981.

Graduate Students and Post-doc. fellows

Thesis work completed: 8 PhDs and 15+ M.S.

Thesis work in progress: 3 M.S.

5 PDFs / Visiting Scholars