Dr. Victor B. Lawrence

Associate Dean and Batchelor Chair Professor
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Victor Lawrence is an industry leader in digital communications R&D, an entrepreneur, an active member of engineering professional organizations, an author, and a teacher who has extensive international experience. Dr. Lawrence has been a key proponent of R&D globalization and has championed the effort to bring fiber optic connectivity to Africa.

Education

1972–Ph.D. , Electrical Engineering, University of London, United Kingdom

1969–D.I.C., Imperial College, University of London, United Kingdom

1968–B.Sc., University of London, United Kingdom

Honors and awards:

- Charter Fellow of the National Academy of Inventors (NAI).
- IEEE Simon Ramo Gold medal for technical Innovation and Leadership, 2007
- IEEE Award in International Communications, 2004
- Member of National Academy of Engineering, 2003
- IEEE Millennium Medal, 2000
- Emmy Award for HDTV Grand Alliance Standard, 1997
- Black Engineer for Outstanding Technical Contributions, 1995
- Fellow of AT&T Bell Laboratories, 1992
- Fellow of IEEE, 1987
- 1986 University of California at Berkeley, Chancellor's Distinguished Lecture Series
- 1984 J. Harry Karp Best Paper Award at Interface '84
- 1981 Gullemin–Cauer Prize Award, IEEE Circuits & Systems Society

Seminars/Lectures

- IEEE (South Jersey Chapter) Fellow and Awards Banquet, April 1996
- Electro '96, April 1996, Somerset, NJ
- David Sarnoff Symposium 2009
- Engineering Networking Society of Paris, France
- IEEE (Stevens chapter)ECE Undergraduate Awards, May 2010
- **"The Art of Scientific Innovation"**, Seminar Presented at University of Medicine and Dentistry, Newark, New Jersey (UMDNJ), for the doctoral students in Medical Informatics, November 2005.

- "Modem Communication System", Seminar course, Pacific Telecommunications Conference, January 13-17, 1991, at Sheraton Waikiki, Honolulu. 15 pages, 35 figures. - with S. V. Ahamed and David Tsao, AT&T Bell Laboratories.

Professional Activities

o   Member, NAE Peer Review Committee, 2004 --
o   Corporate Patrons Chair, ICC2002, 2001–2002
o   Member, IEEE Kilby Medal Selection Committee, 2000–
o   Chairman, IEEE Awards Board, 1994–1995.
o   Vice–Chairman, IEEE Awards Board, 1992–1993.
o   Editor–In–Chief, IEEE Transactions on Communications, 1987–1991.
o   Member of the Board of Governors, IEEE Communications Society, 1990–2014.
o   Member of IEEE Fellow Nomination Committee, 1989–1992.
o   Member of IEEE Awards Policy Planning Committee , 1989–1992.
o   Associate Editor, IEEE Communications Society Magazine, Oct. 1977–1981.
o   Associate Editor, Digital Signal Processing, IEEE Transactions on Circuits and
o   Systems, 1981–1983.
o   Technical Program Chairman, 1st International Workshop on VLSI in Communications, 1981.
o   Technical Program Chairman, 1st International Workshop on Metropolitan Networks, 1986.
o   General Chairman, 4th International Workshop on VLSI in Communications, 1986.
o   Secretary, IEEE Communications Society Technical Committee on Signal Processing and Communication Electronics, 1984–1986.
o   AT&T Representative to CCITT Study Group XVII, 1982–1986.
o   Special Rapporteur on Coding for CCITT SG XVII, 1982–1984.
    Special Rapporteur on Transmission Impairments for CCITT SG XVII, 1984

Work Experience:

2006-Present Associate Dean and Batchelor Chair Professor, Stevens Institute of Technology

1995–2005: Vice President, Advanced Communications Technology, Bell Labs, NJ

1994–1995: Director, Advanced Multimedia Communications Dept., Bell Labs, NJ

1988–1993: Department Head, Data Communications Research Dept., AT&T Paradyne, NJ

1986–1988: Department Head, Digital Techniques Dept., Network Systems Div. Bell Labs, NJ

1982–1986: Supervisor, AT&T Information Systems Laboratories, NJ

1979–1982: MTS, Data Communications Div., Bell Telephone Labs, NJ

1974–1979: MTS, Research Division, Bell Labs, NJ

1973–1974: Asst. Professor, Dept. of Electrical Engineering, Kumasi University, Ghana

1972–1973: Development Engineer, ITT, UK

Book Chapters (Published)

1. "Intelligent Networks: Architecture and Implications," Chapter in Encyclopedia of Physical Science and Technology by Academic Press, 1992, pp. 229–262–with S. V. Ahamed

2. "Transmission Aspects in Integrated Services Digital Network" Chapter 16, ISDN, DEC NET and SNA Communications," edited by Thomas C. Bartee, Publishers–Howard W. Sams & Co. 1989, pp. 221–253–with S. V. Ahamed

Books Published:

Co–author of five books:

"Introduction to Digital Filters," Kluwer Academic Publishers, 1998

"Tutorials on Modem Communications,Computer Science Press, 1983

"Intelligent Broadband Multimedia Networks, Kluwer Academic Publishers, 1997

"Design and Engineering of Intelligent Communications Systems,Kluwer Academic Publishers, 1997

"The Art of Scientific Innovation", Pearson, 2004

Refereed Journal Articles

1. The Next–Generation Signaling System for Switching and control in Integrated Optical Networks, BLTJ, Vol. 7, No. 1, 2002–with K. Sohraby and S. Mohapatra

2. Internet Service Delivery, Application Platforms, and Product Evolution," BLTJ, Vol. 6, No. 2, 2001–with K. Sohraby

3. The Management Paradigm Shift: Challenges from Element Management to Service Management, BLTJ, Vol. 5, No. 4, Oct.–Dec. 2000–with S. Erfani and M. Malek

4. Network Management: Emerging Trends and Challenges," BLTJ, Vol. 4, No. 4, Oct.–Dec. 1999–with S. Erfani, M. Malek, and B. Sugla

5. Broadband Access to the Home on Copper," BLTJ, Summer 1996–with L. J. Smithwick, J. J. Werner, and N. A. Zervos

6. An Introduction to Future Communications Services and Access," BLTJ, Vol. 4, No. 2, April–June 1999–with K. G. August and B. R. Saltzberg

7. Signal Processing for Multimedia, Przeglad Telekomunikacynjy, Vol. 69, No. 8, 1996 (Poland)–with B. Ackland, N. Jayant and L. Rabiner

8. Multimedia: Technology Dimensions and Challenges, AT&T Technical Journal, Vol. 74, No. 5, Sept.–Oct. 1995–with B. Ackland, N. Jayant and L. Rabiner

9. Coding of Speech and Wideband Audio, AT&T Technical Journal, Vol. 69, No. 5, Sept.–Oct. 1990–with N. Jayant, and D. Prezas

10. Multidimensional Signal Constellations for Voice Band Data Transmission, IEEE Journal on Selected Areas in Communications, Vol. 2, No. 5, Sept. 1984, pp. 687–702–with A. Gersho

11. The Effect of Bias on the Linear Canceler, IEEE Transactions on Information Theory, Vol. 30, No. 2 Mar. 1984, pp. 268–274– with T. L. Lim

12. Multiprocessor Implementation of Adaptive Digital Filters, No. 6, June 1983, IEEE Trans. on Communications, Vol. 31, pp. 826–835–with S. K. Tewksbury

13. Controlled Rounding Arithmetics, for Second Order Digital Filters, that Eliminate All Self–sustained Oscillations," IEEE Trans. on Circuits and Systems, Vol. 28, No. 9, Sept. 1981, pp. 894–905–with D. Mitra

14. Finite Precision Design of Linear–Phase FIR Filters, BSTJ, Vol. 59, No 9, Nov. 1980, pp. 1575–1598–with A. C. Salazar

15. A New and Interesting Class of Limit Cycles in Recursive Digital Filters, BSTJ, Vol. 58, No. 2, Feb. 1979, pp. 379–408–with K. V. Mina

16. Digital Processing Techniques in Communications, Invited paper–IEEE Communications Magazine, Jan. 1978, Vol. 16, No. 1, pp. 18–32–V. B. Lawrence, et.al.

17. Control of Limit Cycles in Recursive Digital Filters by Randomized Quantization, IEEE Transactions on Circuits and Systems, Vol. 24, No. 6, June 1977, pp. 291–299–with R. B. Kieburtz, and K. V. Mina

18. Use of Orthogonal Functions in the Design of Digital Filters," Ph.D. Thesis, Nov. 1972, London University.

Refereed Conference papers

Thirty five (35) papers in conference proceedings, covering digital signal processing and data communications

1. "Effect of Wind-Generated Bubbles on OFDM Power Loading for Time-Varying Shallow Water Acoustic Channels with Limited Feedback", Oceans conference, Santander, Spain, June 2011.-with Xiaopeng Huang and Alexander Sutin.

2. "Capacity Criterion-Based Bit and Power Loading for Shallow Water Acoustic OFDM System with Limited Feedback", VTC-2011 Spring, Budapest, Hungary, May 2011.- with Xiaopeng Huang.

3. "Bandwidth-Efficient Bit and Power Loading for Underwater Acoustic OFDM Communication System with Limited Feedback", VTC-2011 Spring, Budapest, Hungary, May 2011- with Xiaopeng Huang.

4. "OFDM with Pilot Aided Channel Estimation for Time-Varying Shallow Water Acoustic Channels". International conference on communications and mobile computing, Shenzhen, China, April 2010.-with Xiaopeng Huang.

5. "Localized Knowledge Bases for Intelligent Technology Transfer", Middle East Measurement and Instrumentation 2004, Bahrain, May 2004–with Ahamed and Yahya.

6. "The Architecture of a Wisdom Machine", Paper at the ANNIE conference, November 2-4, 2003, Rolla, MO and published in the Proceedings, "International Engineering Systems through Artificial Neural Networks, Vol. 13, Smart Engineering System Design, 2003, pp. 81-93- with S. V. Ahamed.

7. "Architecture of a Wisdom Machine," ANNIE 2003, St. Louis, MO, Nov. 2003–with S. Ahamed

8. "Localized Knowledge Based Intelligent Medical Systems", Paper presented at the Sixteenth IEEE Symposium on Computer Based Medical Systems June 26-27, 2003, New York, New York, published in the Conference proceedings pp. 89-96, - with S. V. Ahamed.

9. "Evolving Network Architectures for Medicine, Education and Government Usage," Pacific Telecommunications Council, Honolulu, HI, Jan. 2002, Honolulu, HI–with S. V. Ahamed

10. "Tele Medicine and Medical Networks," SEACOMM–96, Kuala Lumpur, Malaysia, Aug. 1996–with S. V. Ahamed and M. Kroll

11. "Architecture of a Knowledge Machine," Third International Workshop on Community Networking , Antwerpen, Belgium, May 1996–with S. V. Ahamed

12. "Social and Cultural Impact of Intelligent (Broadband) Multimedia Networks (IBMN)," Invited paper at INFOCOM '95, Nov. 1995, Kuala Lumpur, Malaysia–with S. V. Ahamed

13. "Integrated Medical Systems," Symposium on Intelligent Systems in Communications and Power, Mayaguez, PR, Feb. 1994, Proc. of SISCAP'94–with S. V. Ahamed

14. "Telecomputations: A Convergence of Telecommunications and Computations for Developing Countries," Pacific Telecommunications Conference, Honolulu, HI, Jan. 1994, Proc. PTC'93 pp. 195–196–with S. V. Ahamed

15. "Interoperability of Multiple Databases for the Design and Simulation of High–Speed Digital Subscriber Lines," IEEE CS International Conference on Data Engineering, Vienna, Austria, Apr. 19–20, 1993, Proc. RIDE–IMS'93, pp. 262–267–with S. V. Ahamed

16. "Network Based Educational Environments (NBES)," Pacific Telecommunications Conference, Honolulu, HI, Jan. 1993, Proc. PTC'93, pp. 975–980–with S. V. Ahamed

17. "Intelligent Networks: Architecture and Implications," Chapter in Encyclopedia of Physical Science and Technology by Academic Press, 1992, pp. 229–262–with S. V. Ahamed

18. "Evolving Educational Environments: A Projected Impact of the Recent Digital Revolution," Proc. of the Pacific Telecommunications Conference, Jan. 1992, Vol. 14, pp. 431–346–with S. V. Ahamed

19. "Simulation Results for the QAM Codes for DS–1 Rate in Subscriber Loop Plant," IEEE International Symposium on Circuits and Systems, Singapore, June 11–14, 1991, Proc. of ISCAS'91, Vol. 3, pp. 1701–1744–with S. V. Ahamed

20. "Modern Communication System," Pacific Telecommunications Conference, Honolulu, HI , Jan. 1991–with S. V. Ahamed

21. "Social and Technological Implications of Modern Communications Systems," Pacific Telecommunications Conference, Jan. 1991–with S. V. Ahamed

22. "A PC Based CAD Environment For Fiber Optic Simulations," Proc. of the 1989 IEEE Globecom Conference, Dallas, TX, Vol. 2. pp. 19.1.5.1–6–with S. V. Ahamed

23. "Simulation Studies of Higher Rate (To 1.544 MB/s) in Subscriber Loop Plant," Paper No. 232, 1989, Proc. of the IEEE International Symposium on Signals, Systems and Electronics, Erlangen, Germany, Sept. 1989, pp. 232.1–232.5–with S. V. Ahamed

24. "Database Organization and Access for ISDN," IEEE International Workshop on Microelectronics and Photonics in Communications, New Seabury, MA, June 1989–with S. V. Ahamed

25. "Technological and Social Impacts of Intelligent Networks," Pacific Telecommunications Council, Honolulu, HI, Jan. 1989–with S. V. Ahamed

26. "An Image Processing System for Eye Statistics from Eye Diagram," Paper 4–22, Proc. of the International Association for the Pattern Recognition Workshop on Computer Vision, Tokyo, Japan, Oct. 12–14, 1988–with S. V. Ahamed

27. "PC Based Image Processing System for the Two Binary to One Quaternary (2B1Q) Code" Proc. of the 1988 Southeastern Simulation Conference Orlando, FL, Vol. 88, pp. 92–97–with S. V. Ahamed

28. "Low–Speed Data Transmission Using High–Speed Modems," Globecom '84, Nov. 1984, Atlanta, GA–with J. J. Werner

29. "Multidimensional Signal Design for Digital Transmission Over Band Limited Channels," Proc. of International Conference on Communications, Amsterdam, The Netherlands, May 1984, pp. 377–380–with A. Gersho

30. "High Speed Full Duplex Data Transmission Over the Switched Network," Proc. of Interface '84, Las Vegas, NV, Mar. 1984–with Keasler, Smith, Thapar, Wei and Werner

31. "Quantization Schemes for Recursive Digital Filters," Proc. of International Conference on Circuits and Systems, May 1982, Rome, Italy–with E. A. Lee

32. "Design and Implementation of Transmitter and Receiver Filters with Periodic Coefficient Nulls for Digital Systems," Proc. of International Conference on Acoustics, Speech and Signal Processing, May 1982, Paris, France–with A. C. Salazar

33. "Processor Hardware Considerations For Adaptive Digital Filter Algorithms," Proc. of International Conference on Communications, Seattle, WA, June 1980–with D. D. Falconer and S. K. Tewksbury

34. "Effects of Finite Coefficient Precision of FIR Filter Spectra," Proc. of International Symposium on Acoustics Speech and Signal Processing, Apr. 1–4, 1979, Washington, DC–with A. C. Salazar

35. "Summary of Controlled Rounding Arithmetics, for Second Order Digital Filters that Eliminate All Self–Sustained Oscillations," Proc. of International Symposium on Circuits and Systems, May 1978, NY–with D. Mitra

36. "Automatic Equalization Using Orthogonal Functions," Int. Symp. on Digital Filtering, Sept. 1971, London, UK–with R. E. Bogner.

37. "Use of Orthogonal Functions with Constrained Optimization for Digital Filter Design," Int. Symposium on Digital Filtering, Dec. 1970, London, UK–with R. E. Bogner

Patents Pending
1. A New Super Saturation Adder with Memory
2. Apparatus for Managing and Monitoring Local and Global Power Consumption, 10/99
3. Automatic Vehicle Logging System and Method, 6/01
4. Advanced Signaling System for Switching and Control in Integrated Optical Networks, 6/01

5. Sensing and Monitoring the Environment Using Intelligent Networks, 8/01

Patents Issued

30 U.S. and International patents granted; eleven patents pending

1. 7,307,615 Method and apparatus for voice-controlled graphical user interface pointing device, Dec.   11, 2007, with N. L. Gehlot
2. 7,197,310 Methods and systems for controlling handoffs in a wireless communication system, Mar. 3, 2007, with N. L. Gehlot
3. 7,145,550 Method and apparatus for reducing repetitive motion injuries in a computer user, Dec. 5, 2006, with N. L. Gehlot
4. 7,139,270 Systems and method for transporting multiple protocol formats in a lightwave communication network, Nov. 21, 2006, with M. T. Fatehi, K.A. Sohraby
5. 7,131,132 Automatic access denial, Oct. 31, 2006, with N. L. Gehlot
6. 7,072,408 Method and system for using power lines for signaling, telephony and data communications, Apr. 5, 2006, with N. L. Gehlot
7. 6,830,213 Wireless guidance system, Dec. 14, 2004, with N. L. Gehlot
8. 6,822,568 Space area network, November 23, 2004
9. 6,812,840 Object area network, November 2, 2004
10. 6,694,100 Space wavelength time-division multiple access optical transmission system, February 17, 2004
11. 6,641,038 Smart vehicle registration plate, November 4, 2003
12. 6,600,581 Connection verification in optical cross-connect arrangements, July 29, 2003
13. 6,272,481 Hospital–based integrated medical computer system for processing medical and patient information using specialized functional modules, August 7, 2001
14. European Patent # 94307860.0 "Integrated Medical Computer Systems and Methods" EPN 148050 December 29, 1994
15. 6,009,079 Method for measuring HDT–NIU availability, December 28, 1999
16. 5,978,831 Synchronous multiprocessor using tasks directly proportional in size to the individual processors rates, November 2, 1999
17. 5,809,493 Knowledge processing system employing confidence levels, September 15, 1998
18. 5,715,371 Personal computer–based intelligent networks, February 3, 1998
19. 5,628,011 Network–based intelligent information–sourcing arrangement, May 6, 1997
20. 5,524,025 Coding for digital transmission, June 4, 1996
21. 5,164,963 Coding for digital transmission, November 17, 1992
22. European Patent #92301775.0 "Synchronous Multiprocessor Efficiently Utilizing

    Processing Having Different Performance Characteristics" May 12, 1992–Germany, France, Great Britain, Italy and Japan
23. 4,831,637 Apparatus and technique for timing jitter cancellation in a data receiver, May 16, 1989
24. 4,599,719 Full duplex data set with half–duplex emulation, July 8, 1986
25. 4,457,004 Multidimensional channel coding, June 26, 1984
26. 4,412,341 Interference cancellation method and apparatus, October 25, 1983
27. 4,213,187 Digital filters with control of limit cycles, July 15, 1980

28. 4,034,197 Digital filter circuit, July 5, 1977.
29. Patent 4,034,197 has been filed in 13 other countries.
30. European Patent #9437848.5 "Knowledge Machine Methods and Apparatus," EPN 146248