VICTOR S. FROST
Curriculum Vitae

Personal Information

Dan F. Servey Distinguished Professor
Electrical Engineering & Computer Science
University of Kansas
1520 West 15th Street
2054 Eaton Hall
Lawrence, KS 66045

Web Address: http://www.ittc.ku.edu/~frost
Email Address: vsfrost@ku.edu
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Education

PhD EE, Honors, 1982
University of Kansas

MSEE, Honors, 1978
University of Kansas

BSEE, 1977
University of Kansas

Employment History

Academic

University of Kansas
Dan F. Servey Distinguished Professor, EECS Department, 1997 - Present
Chair, EECS, July 1, 2014 - June 30, 2019
Associate Chair for Graduate Studies, EECS Department, February 2011 - July 1, 2014
Director, Information and Telecommunications Technology Center (ITTC), 2000 - 2008
ITTC was one of the largest research centers at the University of Kansas, with approximately 150 faculty, staff, and students, and external expenditures averaging $5.4 Million/year from FY1998-FY2007. ITTC is now called the Institute for Information Sciences
Acting Director, ITTC, 1997 - 1999
Executive Director for Research, ITTC, 1996 - 1997
Professor, Electrical Engineering and Computer Science Department, 1992 - 1997
Director, Telecommunications and Information Sciences Laboratory (TISL), 1987 - 1996
Associate Professor, Electrical and Computer Engineering Department, 1986 - 1992
Associate Director, Telecommunications and Information Sciences Laboratory (TISL), 1986 - 1987
Assistant Professor, Electrical Engineering Department, 1982 - 1986
Project Engineer, University of Kansas Remote Sensing Laboratory, 1978 - 1982
Responsibilities included proposal preparation, direction of graduate and undergraduate research assistants, and reporting to contracting agencies. The research was aimed at determining the stochastic nature of radar images, evaluating the quality of such images, and

developing digital processing techniques for radar data, e.g., enhancement and edge detection.

Research Engineer, University of Kansas Remote Sensing Laboratory, 1976 - 1978
Conducted research in the areas of radar image simulation and system modeling.

Professional

National Science Foundation in CISE/CNS
Program Director, February 2009 - February 2011

United States Air Force, Rome Air Development Center, Communications Division, Rome, NY
Summer Faculty Fellow, Summer 1983
Research related to the analysis and simulation of spread-spectrum communication systems in jamming and intercept environments.

ST*AR Corporation
President, 1979 - 1981
Duties included proposal preparation, supervision of employees, negotiating with contracting agencies, and budgeting.

Research

AT&T Information Systems Laboratory, Denver, CO
Resident visiting member of the technical staff, Summer 1985
Performed simulation and measurement studies of local area networks.

German Aerospace Research Establishment (DFVLR) Institute for High Frequency, Oberpfaffenhofen, West Germany
Visiting Scientist, July 1981 - December 1981
Participated in an International Synthetic Aperture Radar (SAR) experiment. Performed an information theory analysis of SAR images. Developed and implemented image processing algorithms for SAR imagery.

Professional Memberships

ACM (January 1, 2015 - Present)

IEEE (1974 - Present)

Professional Service

Editorial Responsibilities

<u>International</u>

Area Editor
Communications Simulation for ACM Transactions on Simulation and Modeling of Computer Systems. (1997 - 2013)

Editor, Associate

ACM Transactions on Simulation and Modeling of Computer Systems. (2013 - 2023)
IEEE Communications Letters. (1996 - 2000)
ACM Transactions on Simulation and Modeling of Computer Systems. (1996 - 1997)

Guest Editor

IEEE Communications Magazine, Feature Topic on "Performance Experiences with Wide-Area High Speed Networks," (with Donald L. Endicott Jr). (August 1997)
IEEE Journal on Selected Areas in Communications, "ATM LANs: Implementation and Experiences with an Emerging Technology," (with Jack Brassil, Ian Leslie, and Bryan Lyles). (May 1995)
IEEE Communications Magazine, Feature Topic on "Computer-aided Modeling and Simulation for Communications Networks. (March 1994)

Technical Editor

ATM for Dummies, Cathy Gadecki and Christine Heckart, IDG Books Worldwide. (1997)

Other Professional Service

International

Chair

IEEE Transactions on Networking Inter-Society Steering Committee. (2008 - 2009)
IEEE Transactions on Networking Inter-Society Steering Committee. (2005 - 2006)
(Elected) IEEE Communications Society Computer-Aided Modeling of Communications Systems Subcommittee. (1990 - 1992)

Co-Organizer

Second IEEE Communications Society Workshop on Computer-Aided Modeling, Analysis and Design of Communication Links and Networks (CAMAD '88), The University of Massachusetts, Amherst, MA. (October 1988)

Executive Vice-Chair

(Appointed) IEEE International Conference on Communications, Kansas City, Mo. (June 2013 - June 2018)

Member

IEEE Communications Society Technical Committee on Communications Systems Engineering. (December 2015)
IEEE Communications Society Technical Committee on Computer Communications. (December 2015)
Technical Program Committee 19th IEEE International Conference on Network Protocols. (2011)
IEEE Transactions on Networking Inter-Society Steering Committee. (2003 - 2010)
Technical Program Committee for IEEE Workshop on IP Operations and Management. (2003)
Technical Program Committee for IEEE Internet Performance Symposium. (2002)
Program Committee for the First IEEE Workshop on Disaster Recovery Networks, Hilton New York, New York City. (June 24, 2002)
Technical Program Committee for IEEE Symposium on Planning and Design of Broadband Networks, Montebello, Quebec Canada. (October 17, 1996 - October 20, 1996)

Technical Program Committee for IEEE INFOCOM '94. (1994)
Technical Program Committee for the IEEE Symposium on Planning and Design of Broadband Networks, Montebello, Quebec Canada. (October 21, - October 23, 1994)
Technical Program Committee for IEEE INFOCOM '93. (1993)
Technical Program Committee for IEEE INFOCOM '92. (1992)
Organizing Committee for the Fourth IEEE Communications Society Workshop on Computer-Aided Modeling, Analysis, And Design Of Communication Links And Networks (CAMAD '92). (September 1992 - October 1992)
Technical Program Committee for IEEE Global Communications Conference, Globecom '90. (1990)

Member-at-Large
(Elected) IEEE Communications Society Board of Governors. (2008 - 2011)

Panel Chair
First IEEE Workshop on Disaster Recovery Networks, Hilton New York, New York City. (June 24, 2002)

Reviewer
For various IEEE transactions and journals, and other publications.

Secretary
(Elected) IEEE Communications Society Computer-Aided Modeling of Communications Systems Subcommittee. (1986 - 1988)

Session Chair
IEEE Workshop on IP Operations and Management. (2003)
IEEE ICC'96. (1996)
18th Biennial Symposium on Communications, Queen's University, Kingston, Ontario, Canada. (June 4, 1996)
IEEE INFOCOM '94. (1994)
IEEE Global Communications Conference, Globecom '93. (1993)
IEEE Global Communications Conference, Globecom '92. (1992)
IEEE INFOCOM '90. (1990)
IEEE International Conference on Systems Engineering. (August 1989)
IEEE International Communications Conference, ICC '89. (June 1989)

Session Organizer
IEEE Global Communications Conference, Globecom '93. (1993)
IEEE Global Communications Conference, Globecom '92. (1992)
IEEE International Conference on Systems Engineering. (August 1989)
IEEE International Communications Conference, ICC '89. (June 1989)

Technical Program Co-Chair
Fifth IEEE International Workshop On Computer-Aided Modeling, Analysis, And Design Of Communication Links And Networks (CAMAD '94), (with Bhaskar Sengupta, NEC USA), Princeton, NJ. (April 24, 1994 - April 27, 1994)

Vice-Chair
(Elected) IEEE Communications Society Computer-Aided Modeling of Communications Systems Subcommittee. (1988 - 1990)

National

Chair
(Elected) Kansas City Section of the IEEE Communications Society. (June 1991 - December 1992)

Co-Organizer
Silicon Prairie Technology Association Symposium on Industry/University Collaboration. (1989)

Member
Committee of visitors (CoV) to review the Networking research component of the Department of Energy's Advanced Scientific Computing Research (ASCR) program. (2011)
Organizing Committee for the Workshop on Future Heterogeneous Networks, Mountain View, CA. (March 24, 2011 - March 25, 2011)

Reviewer, Proposal
DOE Proposal Review Panel.
NASA Proposal Review Panel.
NSF Proposal Review Panels.

State

Board Member
Board of Trustees of the University of Kansas Self Fellowship Program. (2015 - 2019)
Board of Trustees of the University of Kansas Center for Research, Inc. (1995 - 2008)
Board of Trustees of the University of Kansas Self Fellowship Program. (1993 - 1998)

Member
Executive Committee of the University of Kansas Center for Research, Inc. (2006 - 2007)
Board for the Lawrence Technology Association. (2001 - 2003)
State of Kansas DoD DEPSCoR Steering Committee. (1995 - 1998)
KC Area Silicon Prairie Technology Association Information Technology Steering Committee. (1988 - 1994)
Executive Committee of the University of Kansas Center for Research, Inc. (1989 - 1993)

Reviewer, Proposal
Kansas Technology Enterprise Corp. (Fall 2001)

Task Force Member
Kansas Inc. Task Force on Telecommunications. (Fall 2001)
Senator Pat Roberts Task Force on Information, Telecommunications and Computing Technology. (Spring 2001)
State of Kansas NSF EPSCoR Faculty Task Force. (1991)

Local

Co-Organizer
DARPA Workshop on Wide-Area ATM Performance, (with Donald L. Endicott, Jr), Lawrence, KS. (June 19, 1996 - June 20, 1996)

Organizer
Third Annual Sprint Research Symposium, (with Tom Davis, Rick Lett, Mir Islam), Nichols Hall, University of Kansas, Lawrence, KS. (March 8, 2000 - March 9, 2000)
Second Annual Sprint Applied Research Partners Advanced Networking Symposium, (with William Edwards, and Rick Lett), Nichols Hall, University of Kansas, Lawrence, KS. (March 19, 1998 - March 20, 1998)
Sprint Applied Research Partners Advanced Networking Symposium, (with William Edwards, Tim Kelley, Frank DeNap), Nichols Hall, University of Kansas, Lawrence, KS. (March 18, 1997 - March 19, 1997)

Session Moderator
University of Kansas School of Business Stakeholders Biannual Symposium on Telecommunications. (1990 - 1993)

Honors/Awards/Honor Societies

Honor Societies Honors/Awards

Eta Kappa Nu, National Electrical Engineering Honor Society

Sigma Xi

Tau Beta Pi, National Engineering Honor Society

Individual Honors/Awards

Fellow, IEEE (1998 - Present)
"For contributions to the simulation, monitoring and control of communication networks."

2014 Louise Byrd Graduate Educator Award, KU (2014)

H.O.P.E. Award Finalist (2012)
(Honor for an Outstanding Progressive Educator -- recognizes outstanding teaching and concern for students and is the only honor for teaching excellence
given exclusively by seniors on the KU Lawrence campus through a ballot-and-interview process.)

Senior Member ACM, ACM (Fall 2018 - Present)

2022 was named among the World's Top 2% Scientists.
(Stanford University, using data from Elsevier's Scopus, has compiled a list of the world's top 2% scientists, based on their citations, excluding self-citations. More than 9 million scientists were included in the study, with 186,177 individuals representing the top 2% in the latest version. I was one of the 16 KU Engineering faculty who is on the top 2% list.)

Best Paper Award: 1st Place, American Society for Engineering Educations-Midwest Section, 2021 Annual Conference, for "Teaching the Basic Concepts of Communications Systems Using Interactive Graphics and Calculations"

KU EECS Distinguished Service (KEDS) Award-2024
(An award to recognize distinguished alumni and dedicated associates of the University of Kansas Department of Electrical Engineering and Computer Science.)

Bellows Scholar, University of Kansas School of Engineering (2008)

Sabbatical, Visiting Erskine Fellow University of Canterbury, Christchurch, New Zealand (Spring 2007)

Bellows Scholar, University of Kansas School of Engineering (2005)

Elected member of the European Academy of Science (2002)
"For an outstanding and lasting contribution to communications networking and computer science education"

Miller Scholar, University of Kansas School of Engineering (2002)

Included in the 2002 Kansas City Star "Tech 50" list (June 25, 2002)

Sabbatical, Technical Planning and Integration, Sprint Corp. Overland Park, Kansas (1999 - 2000)

Included in the 2000 Kansas City Star "Tech 50" list (June 13, 2000)

Miller Professional Development Award for Distinguished Service to Engineering, University of Kansas School of Engineering (1991)

Miller Professional Development Award for Distinguished Service to Engineering, University of Kansas School of Engineering (1986)

Presidential Young Investigator Award, National Science Foundation (1984)

Ralph R. Teetor Educational Award, Society of Automotive Engineers (1984)

Honors Undergraduate Research Grant, University of Kansas (Summer 1976)

Research/Scholarly Work

Publications

Books

1. Frost, V.S. (2021). Introduction to Communication Systems: An Interactive Approach Using the Wolfram Language, University of Kansas Libraries, ISBN 978-1-936153-25-1, URI http://hdl.handle.net/1808/31779

Chapters in Books

2. Frost, V. S., & Melamed, B. (1996). Modeling and Simulation of Telecommunications

Networks. In F. E. Froehlich, A. Kent, & C. M. Hall, *The Froehlich/Kent Encyclopedia of Telecommunications*. New York: Marcel Dekker, Inc.

1. Frost, V. S. (1994). Chapter 6, Modeling and Simulation in Network Management. In S. Aidarous & T. Plevyak, *Network Management into the 21st Century*. IEEE Press.

Journal Articles

66. Kuehnhausen, M., & Frost, V. S. (2011). Transportation Security SensorNet: A Service Oriented Architecture for Cargo Monitoring. *Journal of Systems and Information Technology, 13*(4).

65. Jabbar, A., Rohrer, J. P., Frost, V. S., & Sterbenz, J. P. G. (2011). Survivable millimeter wave mesh networks. *Computer Communications, 34*(16).

64. Kuehnhausen, M., & Frost, V. S. (2011). Application of the Java Message Service in Mobile Monitoring Environments. *Journal of Network and Computer Applications, 34*(5), 1707-1716.

63. Fokum, D. T., & Frost, V. S. (2010). A Survey on Methods for Broadband Internet Access on Trains. *IEEE Communications Surveys & Tutorials, 12*(2).

62. Kuehnhausen, M., & Frost, V. S. (2010). Framework for Analyzing SOAP Messages in Web Service Environments. *International Journal of Web Services Practices, 5*(1), 1-9.

61. Fokum, D. T., Frost, V. S., DePardo, D., Kuehnhausen, M., Oguna, A. N., Searl, L. S., Komp, E., Zeets, M., Deavours, D. D., Evans, J. B., & Minden, G. J. (2010). An Open System Transportation Security Sensor Network: Field Trial Experiences. *IEEE Transactions on Vehicular Technology, 59*(8), 3942-3955.

60. Lazarou, G. Y., Baca, J., Frost, V. S., & Evans, J. B. (2009). Describing Network Traffic Using the Index of Variability. *Networking, IEEE/ACM Transactions on, 17*(5), 1672-1683.

59. Jin, Y., Bali, S., Duncan, T., & Frost, V. S. (2007). Predicting Properties of Congestion Events for a Queueing System with fBM Traffic. *IEEE/ACM Transactions on Networking, 15*.

58. Feagan, L., Rohrer, J., Garrett, A., Amthauer, H., Komp, E., Johnson, D., Hock, A., Clark, T., Lushington, G., Minden, G., & Frost, V. (2007). Bioinformatics Process Management: Information Flow via a Computational Journal. *Source Code for Biology and Medicine, 2*(9). doi:10.1186/1751-0473-2-9

57. Lazarou, G. Y., & Frost, V. S. (2007). Variance-Time Curve for Packet Streams Generated by Exponentially Distributed ON/OFF Sources. *IEEE Communications Letters, 11*(6), 552-554.

56. Bali, S., & Frost, V. S. (2007). An Algorithm for Fitting MMPP to IP Traffic Traces. *IEEE Communications Letters, 11*(2), 207-209.

55. Bali, S., Jin, Y., Frost, V. S., & Duncan, T. (2005). Characterizing User-Perceived Impairment Events Using End-to-End Measurements. *International Journal of*

Communication Systems, Int. J. Commun. Syst, 18, 935–960.

54. Nyirenda-Jere, T. P. R., Frost, V. S., & Akar, N. (2005). Capacity Requirements of Traffic Handling Schemes in Multi-Service Networks. *Computer Communications,* Special Issue on End-to-End Quality of Service Differentiation, 28(18), 2070-2081.

53. Zaghloul, S., Frost, V. S., & Mohammad, A. J. (2005). Modeling TCP Long File Transfer Latency over Long Delay Wireless Multilink PPP. *IEEE Communications Letters, 9*(11), 988- 990.

52. Beard, C., & Frost, V. S. (2004). Prioritization of Emergency Network Traffic using Ticket Servers: A Performance Analysis. *Simulation: Transactions of the Society for Modeling and Simulation International, 80*(6), 289-299.

51. Frost, V. S. (2003). Quantifying the Temporal Characteristics of Network Congestion Events for Multimedia Services. *IEEE Transactions on Multimedia, 5*(3), 458-465.

50. Beard, C., & Frost, V. S. (2003). Ticket Servers for Network Traffic Prioritization. *Journal of Network and Systems Management,* 151-170.

49. Radhakrishnan, S., Frost, V. S., & Evans, J. B. (2001). Quality of Service for Rapidly Deployable Radio Networks. *Telecommunications Systems Journal, 18*(1-3), 207-225. Sept-Nov

48. Beard, C., & Frost, V. S. (2001). Prioritized Resource Allocation for Stressed Networks. *IEEE/ACM Transactions on Networking, 9*(5), 618-633.

47. Wijata, Y. I., Niehaus, D., & Frost, V. S. (2000). A Scalable Agent-based Network Measurement Infrastructure. *IEEE Communications Magazine, 38*(9), 174-183.

46. Charalambous, C. P., Frost, V. S., & Evans, J. (1999). Performance of TCP extensions on noisy high BDP networks. *IEEE Letters on Communications, 3*(10), 294-296.

45. Charalambous, C. P., Frost, V. S., & Evans, J. (1999). Performance Evaluation of TCP Extensions on ATM over High Bandwidth Delay Product Networks. *IEEE Communications Magazine,* 57-63.

44. Bush, S. F., & Frost, V. S. (1999). A framework for predictive network management of predictive mobile networks. *Journal of Network and Systems Management, 7*(2).

43. Evans, J. B., Minden, G. J., Shanmugan, K. S., Prescott, G., Frost, V. S., Ewy, B., Sanchez, R., Sparks, C., Malinimohan, K., Roberts, J., Plumb, R., & Petr, D. (1999). The Rapidly Deployable Radio Network. *IEEE Journal on Selected Areas in Communications, 17*(4), 689-703.

42. Frost, V. S. (1998). Information Technology: Drivers, Trends, and Impact. *Kansas City Business Journal, 16*(20), 3-4. Jan 30-Feb 5, Technology Resource Guide

41. Sanchez, R., Evans, J., Minden, G., Frost, V. S., & Sam Shanmugan, k. (1998). RDRN: A Prototype for a Rapidly Deployable Radio Network. *ACM Mobile Computing and*

Communications Review, 2(2), 15-22.

40. Lazarou, G. Y., Frost, V. S., Evans, J. B., & Niehaus, D. (1998). Simulation & Measurement of TCP/IP over ATM Wide Area Networks. *IEICE Transactions on Communications special issue on ATM Switching Systems for Future B-ISDN, E81B*(2), 307-314. Selected for publication in High Performance Backbone Network Technologies, Edited by: Naoaki Yamanaka, IEICE and Marcel Dekker, Inc. ISBN 0-8247-5321-6, 2004.

39. Bush, S. F., Jagannath, S., Sanchez, R., Evans, J. B., Shanmugan, K. S., Frost, V. S., & Minden, G. (1997). A Control and Management Network for Wireless ATM Systems. *ACM/Baltzer Wireless Information Networks (WINET) Journal, 3*(4), 267-283.

38. Dasilva, L., Evans, J. B., Niehaus, D., Frost, V. S., Jonkman, R., Lee, B., & Lazarou, G. (1997). ATM WAN Performance Tools, Experiments, and Results. *IEEE Communications Magazine, 35*(8), 118-125.

37. Liu, K., Zhu, H., Petr, D. W., Frost, V. S., Braun, C., & Edwards, W. (1997). Design and Analysis of a Bandwidth Management Framework for ATM-Based Broadband ISDN. *IEEE Communications Magazine, 35*(5), 138- 145.

36. Bush, S. F., Evans, J. B., & Frost, V. S. (1996). Mobile ATM Buffer Capacity Analysis. ACMBaltzer Mobile Networks And Nomadic Applications (NOMAD): *Topical Journal on Mobility of Systems, Users, Data and Computing, 1*(1).

35. Petr, D. W., Frost, V. S., Kelley, T., Braun, C., & Demirjis, A. (1996). Cell Loss Quality of Service in an Integrated Traffic ATM Network. *International Journal of Communications Systems, 9*, 97-104.

34. Evans, J. B., Niehaus, D., Petr, D. W., Frost, V. S., Minden, G. J., & Ewy, B. (1996). A 622 Mb/s LAN/WAN Gateway and Experiences with ATM Networking. *IEEE Network Magazine, 10*(3), 40-48.

33. Zhu, H., & Frost, V. S. (1996). In-Service Monitoring for Cell Loss Quality of Service Violations in ATM Networks. *IEEE/ACM Transactions on Networking, 4*(2).

32. Motoyama, S., Petr, D. W., & Frost, V. S. (1995). Input-Queued Switch Based on a Scheduling Algorithm. *Electronics Letters, 31*(14), 1127-1128.

31. Petr, D. W., Frost, V. S., Neir, L., Demirtjis, A., & Braun, C. (1995). Simulation Comparison of Broadband Networking Technologies. *Simulation, 64*(1), 42-50.

30. Frost, V. S., & Melamad, B. (1994). Traffic Modeling for Telecommunications Networks. *IEEE Communications Magazine, 32*(3), 70-81.

29. Wang, Q., & Frost, V. S. (1993). Efficient Estimation of Cell Blocking Probability for ATM Systems. *IEEE/ACM Transactions on Networking, 1*(2).

28. Kumara, S., Ham, I., Ohsuga, S., Tsatsoulis, C., Ramesh, R., Frost, V. S., & Kashyap, R. L. (1992). Intelligent Computer-Integrated Manufacturing (I-CIM): Research Perspectives. *International Journal of Applications of Artificial Intelligence, 6*, 529-552.

27. Petr, D. W., & Frost, V. S. (1992). Optimized Nested Threshold Cell Discarding for ATM Overload Control. *International Journal of Digital and Analog Communication Systems, 5*, 97-116.

26. Bulgren, W., Frost, V. S., & Chang, C. (1992). A Model for Interconnected LANs with General Arrivals. *Journal of Systems and Software, 17*(2), 145-153.

25. Petr, D. W., Murthy, K. M. S., Frost, V. S., & Neir, L. (1992). Modeling and Simulation of the Resource Allocation Process in a Bandwidth-on-Demand Satellite Communications Network. *IEEE Journal on Selected Areas in Communications, 10*(2), 465-477.

24. Shanmugan, K. S., Frost, V. S., & LaRue, W. W. (1992). A Block-Oriented Network Simulator (BONeS). *Journal of Simulation, 58*(2), 83-94.

23. Frost, V. S., LaRue, W. W., McKee, A. G., Ernstein, A. J., Kishore, P., & Gormish, M. J. (1990). A Tool for Local Area Network Modeling and Analysis. *Journal of Simulation, 5*, 283-298.

22. Petr, D. W., & Frost, V. S. (1990). Priority Cell Discarding for Overload Control in B-ISDN/ATM Networks: An Analysis Framework. *International Journal of Digital and Analog Communications Systems, Special Issue on Broadband Network Performance and Congestion Control, 3*(2), 219-227.

21. Frost, V. S., & LaRue, W. W. (1990). A Technique for Extrapolating the End-to-End Performance of HDLC Links for a Range of Lost Packet Rates. *IEEE Transactions on Communications, 38*(4), 461-466.

20. DaSilva, L. A., Petr, D. W., & Frost, V. S. (1989). A Class-Oriented Replacement Technique for Lost Speech Packets. *IEEE Transactions on Acoustics Speech and Signal Processing, 37*(10), 1597-1600.

19. Petr, D. W., DaSilva, L. A., & Frost, V. S. (1989). Priority Discarding of Speech in Integrated Packet Networks. *IEEE Journal on Selected Areas in Communications, 7*(5), 644-656.

18. Frost, V. S., LaRue, W. W., & Shanmugan, K. S. (1988). Efficient Techniques for the Simulation of Computer Communications Networks. *IEEE Journal on Selected Areas in Communications, 6*(2), 146-157.

17. Curlis, J. D., Frost, V. S., & Dellwig, L. F. (1986). Geological Mapping Potential of Computer-Enhanced Images from the Shuttle Imaging Radar: Lisbon Valley Anticline Utah. *Photogrammetric Engineering and Remote Sensing, 52*(4), 525-532.

16. Frost, V. S., Freedman, E. M., & Minden, G. J. (1986). Multirate Voice Coding for Load Control on CSMA/CD Local Computer Networks. *Computer Networks and ISDN Systems, 11*(2), 99-110.

15. Frost, V. S., & Minden, G. J. (1986). A Data Compression Technique for Synthetic Aperture Radar Images. *IEEE Transactions on Aerospace Electronics Systems, AES-22*(1), 47-55.

14. Frost, V. S., & Yurovsky, L. S. (1985). Maximum Likelihood Classification of Synthetic Aperture Radar Imagery. *Computer Vision, Graphics and Image Processing, 32*, 291-313.

13. Townsend, J. K., Shanmugan, K. S., & Frost, V. S. (1985). Optimal frequency domain textural edge detection filter. *Applied optics, 24*(14), 2067. PMID: 18223839

12. Frost, V. S. (1984). Probabilistic Modeling of Radar Images of Agricultural Sciences. *Electromagnetics*.

11. Frost, V. S., Shanmugan, K. S., & Holtzman, J. C. (1984). The Influence of Sensor and Flight Parameters on Texture in Radar Images. *IEEE Transactions on Geoscience and Remote Sensing, GE-22*(5), 440-448.

10. Frost, V. S. (1984). Probability of Error and Radiometric Resolution for Target Discrimination in Radar Images. *IEEE Transactions on Geoscience and Remote Sensing, GE-22*(2), 121-125.

9. Wade, W. D., Mortara, M. E., Leong, P. K., & Frost, V. S. (1984). Interactive Communications System Simulation Model - ICSSM. *IEEE Journal on Selected Areas in Communications, SAC-2*(1), 102-128.
   Special Issue on Computer-Aided Modeling, Analysis, and Design of Communications Systems

8. Frost, V. S., & Shanmugan, K. S. (1983). The Information Content of Synthetic Aperture Radar Images of Natural Terrain. *IEEE Transactions on Aerospace and Electronics Systems, AES-19*(5), 768-774.

7. Frost, V. S., Perry, M. S., Dellwig, L. F., & Holtzman, J. C. (1983). Digital Enhancement of SAR Imagery as an Aid to Geologic Data Extraction. *Photogrammetrical Engineering and Remote Sensing, 49*(3), 358-364.

6. Stiles, J. A., Frost, V. S., Holtzman, J. C., & Shanmugan, K. S. (1982). The Recognition of Extended Targets: SAR Images for Level and Hilly Terrain. *IEEE Transactions on Geoscience and Remote Sensing, GE-20*(2), 205-211.

5. Frost, V. S., Stiles, J. A., Shanmugan, K. S., & Holtzman, J. C. (1982). A Model for Radar Images and Its Application to Adaptive Digital Filtering of Multiplicative Noise. *IEEE Transactions on Pattern Analysis and Machine Intelligence, PAMI-4*(2), 157-166.

4. Shanmugan, K. S., Narayanan, V. K., Frost, V. S., Stiles, J. A., & Holtzman, J. C. (1981). Textural Features for Radar Image Analysis. *IEEE Transactions on Geoscience and Remote Sensing, GE-19*(3), 153-156.

3. Frost, V. S., Stiles, J. A., Shanmugan, K. S., Holtzman, J. C., & Smith, S. A. (1981). An Adaptive Filter for Smoothing Noisy Radar Images. *The Proceedings of the IEEE, 69*(1), 133-155.

2. Holtzman, J. C., Stiles, J. A., Frost, V. S., Kaupp, V. H., & Komp, E. E. (1979). A Digital Computation Technique or Radar Scene Simulation: New SLAR. *Simulation,* 183-192.

1. Holtzman, J. C., Frost, V. S., Abbott, J. L., & Kaupp, V. H. (1978). Radar Image Simulation. *IEEE Transactions on Geoscience Electronics, GE-16*(4), 296-303.

Conference Proceedings

95. Frost, V. S. Fundamentals of Communication Systems Using the Wolfram Language, (2021), Wolfram Technology Conference 2021.

94. Frost, V. S. Teaching the Basic Concepts of Communications Systems Using Interactive Graphics and Calculations, (2021), 2021 ASEE Midwest Section Conference. Received best paper award 1st place.

93. Shabsigh, G., & Frost, V. S. (2016). Quantifying Covertness in the Presence of Primary Networks. In *2016 IEEE Global Communications Conference*.

92. Ghaith Shabsigh, G., & Frost, V. S. (2016). Stochastic Geometry for the Analysis of Wireless Covert Networks. In *IEEE MILCOM 2016*.

91. Shabsigh, G., & Frost, V. S. (2015). Covert Communications in Wideband OFDMA Primary Networks. In *IEEE Globecom 2015 Workshop on Trusted Communications with Physical Layer Security*.

90. Hijaz, Z., & Frost, V. S. (2014). A Method for Analyzing the Impact of Interference on a Wireless Link with OFDM, AMC, HARQ, and a Finite Queue. In *17th International Symposium on Wireless Personal Multimedia Communications (WPMC'2014)*.

89. Hijaz, Z., & Frost, V. S. (2014). The Impact of Interference on an OFDM System with AMC, Hybrid ARQ, and a Finite Queue on End-to-End Performance. In *IEEE International Symposium on Communication Systems, Networks and Digital Signal Processing-CSNDSP14*.

88. Hijaz, Z., & Frost, V. (2014). A Method for estimating the average packet error rates of multi-carrier systems with interference. In *4th Annual IEEE Channel Quality and Reliability International Workshop-CQR 2014*.

87. Hijaz, Z., & Frost, V. S. (2013). The Impact of Interference from a Covert Link on a Data Link using OFDM, AMC, and Hybrid ARQ. In *Poster Paper at 32nd IEEE International Performance, Computing, and Communication Conference (IPCCC) December 6-8, San Diego, California, USA*.

86. Kuehnhausen, M., & Frost, V. S. (2013). Trusting Smartphone Apps? To install or not to install, that is the question. In *2013 IEEE Conference on Cognitive Methods in Situation Awareness and Decision Support (CogSIMA), 25-28 February, San Diego, California, USA*.

85. Kuehnhausen, M., Frost, V. S., & Minden, G. (2012). Framework for Assessing the Trustworthiness of Cloud Resources. In *2012 IEEE Conference on Cognitive Methods in Situation Awareness and Decision Support (CogSIMA)*.

84. Hijaz, Z., & Frost, V. S. (2010). Exploiting OFDM Systems for Covert Communication. In *2010 IEEE Military Communications Conference, San Jose, Cal, Oct 31-Nov 3*.

83. Jabbar, A., Rohrer, J. P., Oberthaler, A., Cetinkaya, E. K., Frost, V., & Sterbenz, J. P.G. (2009). Performance Comparison of Weather Disruption-Tolerant Cross-Layer Routing

Algorithms. In *INFOCOM 2009 Rio de Janerio, Brazil, April 19-25*.

82. Quanz, B., Fei, H., Huan, J., Evans, J., Frost, V., Minden, G., Deavours, D., Searl, L., DePardo, D., Kuehnhausen, M., Fokum, D., Zeets, M., & Oguna, A. (2009). Anomaly Detection with Sensor Data for Distributed Security. In *Proc. 18th Int'l Conf. Computer Communications and Networks (ICCCN 2009), San Francisco, CA, USA, Aug., pp. 1–6*.

81. Bali, S., Machiraju, S., Zang, H., & Frost, V. (2007). A Measurement Study of Scheduler-based Attacks in 3G Wireless Networks. In *Eighth Passive and Active Measurement Conference April 5-6, Louvain-la-neuve, Belgium*.

80. Alanqar, W., & Frost, V. (2006). A Service Profile-Aware Control Plane with a Comparison to IETF & ITU Approaches. In *IEEE International Conference on Communications*.

79. Jin, Y., Bali, S., Duncan, T. E., & Frost, V. S. (2006). Properties of Congestion Events for a Queue with Fractional Brownian Traffic. In *Poster at Conference on Stochastic Networks, June 19-24, University of Illinois at Urbana-Champaign*.

78. Jin, Y., Bali, S., Duncan, T., & Frost, V. S. (2006). Conditioned Fractional Brownian Motion and its Applications in Telecommunications. In *Joint Mathematics Meetings, San Antonio, TX, January 12-15*.

77. Jabbar Mohammad, A., Frost, V., Zaghloul, S., Prescott, G., & Braaten, D. (2004). Multi-channel Iridium Communication System for Polar Field Experiments. In *2004 IEEE International Geoscience and Remote Sensing Symposium, Anchorage Alaska, 20-24 September, pp 121-124*.

76. Mohammad, A., Chalishazar, N., Frost, V., & Prescott, G. (2004). Alternative Communication Networking in Polar Regions. In *International Symposium on Advanced Radio Technologies, Boulder, Colorado March 2-4*.

75. Kulkarni, A., Minden, G., Frost, V., & Evans, J. (2004). Survivability of Active Networking Services. In *IWAN '99. Selected for publication in Lecture Notes in Computer Science, Springer, v1653, pp. 299-306*.

74. Gardner, T., Petr, D. W., & Frost, V. S. (2003). Using Optimization to Achieve Efficient Quality of Service in Voice over IP Networks. In *22nd International Performance, Computing, and Communications Conference, Phoenix, Arizona, April 9-11*.

73. Lazarou, G. Y., Xia, X., & Frost, V. S. (2003). Internet Traffic Modeling Using the Index of Variability. In *IASTED International Conference on Modeling and Simulation (MS 2003) February 24-26, Palm Springs, California*.

72. Mohammad, A., Frost, V., & Braaten, D. (2003). Results of an Iridium-Based Data Communication System Providing Internet Access to Polar Expeditions. In *American Geophysical Union Fall Meeting, Dec 8-12*.

71. Beard, C. C., & Frost, V. S. (2001). Ticket Server Performance Evaluation Using a Hybrid Simulation Approach. In *Proceedings of the SCS 2001 Applied Telecommunication Symposium, Seattle, Washington, April*.

70. Nyirenda-Jere, T. P.R., Frost, V. S., & Akar, N. (2001). Impact of Traffic Handling on Internet Capacity. In *SPIE ITCom, Denver, Colorado, August 20-24*.

69. Nyirenda-Jere, T. P.R., Frost, V. S., & Akar, N. (2001). Traffic Handling and Network Capacity in Multi-Service Networks. In *IEEE Globecom, San Antonio, Tx*.

68. Beard, C. C., & Frost, V. S. (1999). Connection Admission Control for Differentiating Priority Traffic on Public Networks. In *IEEE MILCOM '99*.

67. Beard, C., & Frost, V. S. (1999). Dynamic Agent-Based Prioritized Connection Admission for Stressed Networks. In *1999 IEEE International Conference on Communications, Vancouver, Canada, June 7-9*.

66. Kulkarni, A., Minden, G., Frost, V., & Evans, J. (1999). Survivability of Active Networking Services. In *IWAN '99*.

65. Charalambos, C. P., Lazarou, G. Y., Frost, V. S., Evans, J., & Jonkman, R. (1998). Experimental and Simulation Performance Results of TCP/IP over High-Speed ATM over ACTS. In *IEEE International Conference on Communications*.

64. Frost, V. S. (1998). Building Successful Industry/University Partnerships in Information and Telecommunications Sciences. In *Merrill Advanced Studied Center Conference on Mobilizing for Research Opportunities in the Next Century, July 15-17*.

63. Sanchez, R., Evans, J., Frost, V., Minden, G., & Shanmugan, K. S. (1998). RDRN: A Rapidly Deployable Radio Network-Implementation and Experiences. In *IEEE 1998 International Conference on Universal Personal Communications, Oct. 5-9, Florence, Italy*.

62. Sanchez, R., Wahhab, F., Evans, J., Frost, V., & Minden, G. (1998). Design and Evaluation of an Adaptive Data Link Control Protocol for Wireless ATM Networks. In *IEEE IEEE Global Telecommunications Conference, Nov. 1998, Sydney, Australia, pp 2239-2244*.

61. DaSilva, J. L., Evans, J., Niehaus, D., Frost, V., Jonkman, R., Lee, B., & Lazarou, G. (1997). Performance Experiences in a Wide Area ATM Network. In *IEEE International Conference on Communications, Montreal, Canada, pp 1694-1698, June*.

60. Bush, S. F., Frost, V. S., & Evans, J. B. (1996). Predictive Systems in Network Management with Mobility. In *1996 IEEE Symposium on Planning and Design of Broadband Networks, Montebello, Quebec, Canada, Oct. 17-20*.

59. DaSilva, L., Lett, R., & Frost, V. S. (1996). Performance Considerations in File Transfers Using FTP Over Wide-Area ATM Networks. In *22nd International Conference for the Resource Management and Performance Evaluation of Enterprise Computing Systems, San Diego Cal, Dec. 8-13*.

58. Evans, J. B., Frost, V. S., Niehaus, D., Petr, D. W., Minden, G. J., & Ewy, B. J. (1996). A 622 Mb/s ATM LAN/WAN Gatway with Cell Level Measurement and Pacing Capabilities. In *HOT INTERCONNECTS SYMPOSIUM IV 1996, Kresge Auditorium, Stanford University, Palo Alto, CA, August 15-17*.

57. Frost, V. S., & Zhu, H. (1996). Real-Time Detection of Quality of Service Violations in High-Speed Networks. In *1996 SIAM Annual Meeting, Kansas City, Missouri, July 22-26*.

56. Kulkarni, A. B., Minden, G. J., Frost, V. S., & Evans, J. (1996). An Active Network Architecture for ATM WANs. In *3rd International Workshop on Mobile Multimedia Communications, Princeton, New Jersey, September 25-27*.

55. Kulkarni, A., Minden, G., Frost, V., & Evans, J. (1996). An Active Network Architecture for ATM WANs. In *3rd International Workshop on Mobile Multimedia Communications Conference, Princeton, New Jersey, September 25-27*.
    Selected for publication in, Mobile Multimedia Communications, Plenum Publishing, Chapter 3, Nov 1997

54. Lazarou, G. Y., Frost, V. S., Evans, J. B., & Niehaus, D. (1996). Using Measurements to Validate Simulation Models of TCP/IP over High Speed ATM Wide Area Networks. In *IEEE International Conference on Communications, Dallas, TX, June*.

53. Bush, S. F., Jagannath, S., Evans, J. B., & Frost, V. S. (1996). A Control and Management Network for Wireless ATM Systems. In *IEEE International Conference on Communications, Dallas, TX*.

52. Liu, K., Zhu, H., Petr, D. W., Frost, V. S., Braun, C., & Edwards, W. (1996). Design and Analysis of a Bandwidth Management Framework for ATM-Based Broadband ISDN. In *IEEE International Conference on Communications, Dallas, TX*.

51. Braun, C., Sirkay, V., Uriona, H., Seetharam, S., Yousefi, E., Petr, D. W., Niehaus, D., Frost, V. S., Evans, J. B., & Minden, G. J. (1995). A High Speed Implementation of Adaptive Shaping for Dynamic Bandwidth Allocation. In *Fourth IEEE Symposium on High Performance Distributed Computing, pp. 94-101*.

50. Ewy, B. J., Evans, J. B., Frost, V. S., & Minden, G. J. (1995). TCP/ATM Experiences in the MAGIC Testbed. In *Fourth IEEE Symposium on High Performance Distributed. Computing, pp. 87-93, August*.

49. Motoyama, S., Petr, D. W., & Frost, V. S. (1995). A Connection Admission Control Based on Real Time Traffic Statistics. In *Proc. 13th Brazilian Telecommunication Symposium, Vol.1, pp. 31-36, Sept. 3-6, Aguas de Lindoia, SP, Brazil*.

48. Zhu, H., & Frost, V. S. (1995). Single Point On-line Estimation of Cell Loss in ATM Networks. In *14th European Conference of Operations Research, Jerusalem, Israel, June 3-6*.

47. Zhu, H., DaSilva, L. A., Evans, J. B., & Frost, V. S. (1995). Performance Evaluation of Congestion Control Mechanisms in ATM Networks. In *20th International Conference of the Computer Measurement Group, Nashville, TN, December 3-8*.

46. Wang, Q., & Frost, V. S. (1994). Estimation of Cell Loss Probabilities for Tandem ATM Queues. In *IEEE Communications Conference*.

45. Zhu, H., & Frost, V. S. (1994). A New Method for In-Service Estimation of Cell Loss QoS in ATM Networks. In *IEEE Symposium on Planning and Design of Broadband Networks,*

Montebello, Quebec, Canada, Oct. 21-23.

44. Minden, G. J., Evans, J. B., Petr, D. W., & Frost, V. S. (1993). An ATM WAN/LAN Gateway Architecture. In *Second International Symposium on High Performance Distributed Computing, Spokane, Washington, July 21-23*.

43. Petr, D. W., Evans, J. B., Neir, L., Singh, J., & Frost, V. S. (1993). Access Traffic Control Implementations for Frame Relay. In *IEEE International Communications Conference, April*.

42. Mullen, M. T., & Frost, V. S. (1992). Dynamic Bandwidth Allocation for B-ISDN Based on End-to-End Delay Estimates. In *IEEE International Communications Conference, vol. 1, pp. 225-231, June*.

41. Kavi, P., Frost, V. S., & Shanmugan, K. S. (1991). Generic Approach to LAN Modeling. In *Winter Simulation Conference, Phoenix AZ. Dec. 8 -11. Invited Paper*. (Invited)

40. Petr, D. W., & Frost, V. S. (1991). Nested Threshold Cell Discarding for ATM Overload Control: Optimization Under Cell Loss Constraints. In *IEEE INFOCOM, Bal Harbour, FL, pp. 1403-1412, April*.

39. Tari, F., & Frost, V. S. (1991). Performance Comparison of DQDB and FDDI for Integrated Networks. In *16th Local Computer Networks Conference, Oct. 16-17*.

38. Wang, Q., & Frost, V. S. (1991). A New Solution Technique for Discrete Queueing Analysis of ATM Systems. In *IEEE Global Telecommunications Conference, Dec. Invited Paper*. (Invited)

37. Wang, Q., & Frost, V. S. (1991). Efficient Estimation of Cell Blocking Probability for ATM Systems. In *EEE International Communications Conference, Denver, CO, pp. 385-390, June 23-26*.

36. LaRue, W. W., Komp, E. E., Schaffer, S., Frost, V. S., Shanmugan, K. S., & Reznik, D. (1990). A Block Oriented Paradigm for Modeling Communications Networks. In *IEEE Military Communications Conference, Monterey, CA, pp. 689-695, October*.

35. Petr, D. W., & Frost, V. S. (1990). Optimal Packet Discarding: An ATM-Oriented Analysis Model and Initial Results. In *IEEE INFOCOM, San Francisco, CA, pp. 537-542, June*.

34. Petr, D. W., & Frost, V. S. (1990). Optimal Threshold-Based Discarding for Queue Overload Control. In *International Teletraffic Conference, Morristown, NJ, October*.

33. DaSilva, L. A., Petr, D. W., & Frost, V. S. (1989). A Class-Oriented Replacement Technique for Lost-Speech Packets. In *IEEE INFOCOM, Ottawa, Canada, April*.

32. Francis, S., Frost, V. S., & Soldan, D. (1989). Measured Ethernet Performance for Multiple Large File Transfers. In *14th IEEE Local Computer Network Conference, Minneapolis, Minnesota, October 10-12*.

31. Frost, V. S., & Shanmugan, K. S. (1989). BONeS, A Block Oriented Network Simulator. In *Fourth Annual Conference on Computer Communications, Denna Point, California, October 30 - November 1*.

30. Gormish, M. J., & Frost, V. S. (1989). A Comparison of Computational Techniques of Network Analysis. In *IEEE International Conference on Systems Engineering, Fairborn, Ohio, pp. 479-482, August 24-26*.

29. Shanmugan, K. S., LaRue, W. W., Komp, E., McKinley, M., Minden, G. J., & Frost, V. S. (1988). Block-Oriented Network Simulator (BONeS). In *IEEE Global Communications Conference, pp. 1679-1683, Hollywood, Florida, November 28-December 1*.

28. Frost, V. S., Kashefipour, M., LaRue, W. W., & Ananthanpillai, R. (1987). A Combined LAPD/CSMA-CD Simulation Model for the Study of Local Area Networks. In *International Communications Conference, Seattle, WA, June*.

27. Frost, V. S., Moats, R., Spahn, R., Fechtel, S., & Balasubramanian, R. (1987). The Evaluation of HF Communications Systems Using Simulation Workstations. In *IEEE Military Communications Conference, October*.

26. LaRue, W. W., Frost, V. S., & Shanmugan, K. S. (1987). Some New Efficient Techniques for the Simulation of Computer Communications Networks. In *Proceedings of the 1987 Symposium on the Simulation of Computer Networks, pp. 152-158, August, Colorado Springs, CO.*.

25. Shanmugan, K. S., & Frost, V. S. (1987). CAD Tools for Communications System Engineering. In *Fifth International Conference on Systems Engineering, Fairborn, OH, September*.

24. Frost, V. S., & Minden, G. J. (1986). A Data Compression Technique for Synthetic Aperture Radar Images. In *IEEE Transactions on Aerospace Electronics Systems, vol. AES-22, no. 1, pp. 47 - 55, January*.
    Selected for inclusion in "Image Data Compression: Block Truncation Coding," B.V. Dasarathy, Ed., IEEE Computer Society Press, 1995

23. Frost, V. S., & Shanmugan, K. S. (1986). Hybrid Approaches to Network Simulation. In *International Conference on Communications, June*.

22. Frost, V. S., Friedman, E. M., & Minden, G. J. (1985). Multirate Voice Coding for Load Control on CSMA/CD Local Computer Networks. In *Tenth Conference on Local Computer Networks, Minneapolis, Minnesota, October 7 - 9*.

21. Frost, V. S., Friedman, E. M., & Minden, G. J. (1985). Multirate Voice Coding for Load Control on CSMA/CD Local Computer Networks. In *Tenth Conference on Local Computer Networks, Minneapolis, Minnesota, October 7 - 9*.
    Selected for publication in a Special Issue of Computer Networks and ISDN Systems, vol. 11, no. 2, February 1986, pp. 99 - 110

20. Frost, V. S., Gaylor, K. L., & Shanmugan, K. S. (1984). Time Domain Simulation of Scanning Intercept Receivers for the Detection of Spread Spectrum Signals. In *Proceedings of the 1984 Summer Computer Simulation Conference, vol. 1, p. 471, July 23-25, Boston, MA*.

19. Shanmugan, K. S., McKinley, M. S., Frost, V. S., Friedman, E. M., & Holtzman, J. C. (1984).

Wideband Digital Transmissions Through Atmosphere at EHF Frequencies: Effects of Refractive Dispersion. In *Global Telecommunications Conference, Atlanta, Georgia, November 26 - 29*.

18. Frost, V. S., Shanmugan, K. S., & Holtzman, J. C. (1983). Telecommunications Systems Engineering Programs. In *National Communications Forum, Chicago, Illinois, October 24 - 26*.

17. Frost, V. S., Shanmugan, K. S., & Holtzman, J. C. (1983). The Influence of Sensor and Flight Parameters on Texture in Radar Images. In *NASA Symposium on Mathematical Pattern Recognition and Image Analysis, Houston, Texas, June 1 - 3*.

16. Shanmugan, K. S., Frost, V. S., & Leong, P. K. (1983). Simulation of Spread-Spectrum Systems Using ICSSM. In *Global Telecommunications Conference, San Diego, California, November 28 -December 1*.

15. Frost, V. S., Shanmugan, K. S., & Holtzman, J. C. (1982). A Statistical Model for Radar Images of Agricultural Scenes. In *IGARSS '82 Digest, International Geoscience and Remote Sensing Symposium, Munich, West Germany, June 1 - 4*.

14. Frost, V. S., Shanmugan, K. S., & Holtzman, J. C. (1982). An Information Theory Characterization of Radar Images and New Definition for Radiometric Resolution. In *IGARSS '82 Digest, International Geoscience and Remote Sensing Symposium, Munich, West Germany, June 1 - 4*.

13. Frost, V. S., Stiles, J. A., Shanmugan, K. S., & Holtzman, J. C. (1982). A Model for Radar Images and Its Application to Adaptive Digital Filtering of Multiplicative Noise. In *IEEE Transactions on Pattern Analysis and Machine Intelligence, vol. PAMI-4, no. 2, pp. 157-166, March*.
    Selected for inclusion in “Digital Image Processing and Analysis: Vol. 1: Digital Image Processing,” R. Chellappa and A. Sawchuk eds. IEEE Computer Society Press, 1985

12. Frost, V. S., Stiles, J. A., Shanmugan, K. S., & Holtzman, J. C. (1981). A Model for Simulation and Processing of Radar Images. In *International Geoscience and Remote Sensing Symposium, Washington, D. C., June 8 - 10*.

11. Frost, V. S., Holtzman, J. C., Stiles, J. A., & Held, D. N. (1980). Digital Preprocessing of SEASAT Imagery. In *International Conference on Communications, Seattle, Washington, June 8 - 11*.

10. Frost, V. S., Holtzman, J. C., Stiles, J. A., & Held, D. N. (1980). Radar Image Preprocessing. In *Sixth Purdue Symposium on Machine Processing of Remote Sensing Data, Purdue University, West Lafayette, Indiana, June 2 - 6*.

9. Frost, V. S., Holtzman, J. C., Stiles, J. A., Dellwig, L. F., & Held, D. N. (1980). Radar Image Enhancement and Simulation as an Aid to Interpretation and Training. In *International Symposium on Remote Sensing of Environment, San Jose, Costa Rica, April 23 - 30*.

8. Frost, V. S., Stiles, J. A., Shanmugan, K. S., & Holtzman, J. C. (1980). A System Model for Imaging Radars and Its Application to Minimum Mean Square Error Filtering. In *Fifth International Conference on Pattern Recognition and Image Processing, Miami Beach,*

Florida, December 1 - 4.

7. Frost, V. S. (1980). Image Analysis: Current and Future Possibilities in the Study of Brain Function. In *Video Tape Presentation at Brain Function and Metabolism in Cholinergic Poisoning, U. S. Army Biomedical Laboratory, Edgewood Area, Aberdeen Proving Ground, Maryland, February 27*.

6. Frost, V. S., Holtzman, J. C., Stiles, J. A., Komp, E. E., Bergan, E. S., & Kaupp, V. H. (1979). Seasonal Effects on Radar Imagery as Predicted by the PSM Simulation Techniques. In *Tenth Annual Pittsburgh Conference on Modeling and Simulation, The University of Pittsburgh, Pittsburgh, Pennsylvania, April*.

5. Frost, V. S., Holtzman, J. C., Abbott, J. L., & Kaupp, V. H. (1978). Image Synthesis for SAR Systems, Calibration, and Processor Design. In *Proceedings of the Synthetic Aperture Radar Technology Convention, Las Cruces, New Mexico, March 8 - 10*.

4. Frost, V. S., Holtzman, J. C., Kaupp, V. H., & Abbott, J. L. (1978). An Image Simulation Model for Radar Guidance. In *Ninth Annual Pittsburgh Conference on Modeling and Simulation, The University of Pittsburgh, Pittsburgh, Pennsylvania, April*.

3. Frost, V. S., Holtzman, J. C., Stiles, J. A., & Kaupp, V. H. (1978). Computer Generated Radar Images for Navigation. In *Proceedings of the Military Electronics Expo, Anaheim, California, November 14 - 16*.

2. Frost, V. S., Holtzman, J. C., Kaupp, V. H., Abbott, J. L., & Martin, R. (1977). Simulation of Imaging Radar Systems. In *Eighth Annual Pittsburgh Conference on Modeling and Simulation, The University of Pittsburgh, Pittsburgh, Pennsylvania, April 21 - 22*.

1. Frost, V. S. (1977). Electronic Image Enhancement of Autoradiographs to Facilitate Measurement of Brain Injuries. In *IEEE Student Papers*.

Online Demonstrations

1. Frost, V. S. “Eye Diagrams for Raised-Cosine Pulses”, created a visual demonstration of an eye diagram including the timing error, amount of intersymbol interference and noise margin. http://demonstrations.wolfram.com/EyeDiagramsForRaisedCosinePulses/ Wolfram Demonstrations Project, Published: July 6, 2023.

2. Frost, V. S. “Link Budget for Communication Systems”, created a visual demonstration of link budget. http://demonstrations.wolfram.com/LinkBudgetForCommunicationSystems/ Wolfram Demonstrations Project, Published: July 6, 2023.

3. Frost, V. S. “Efficiency versus Delay for a Sliding-Window Data-Link Control Protocol”, created a visual demonstration the efficiency of a sliding-window data-link control protocol as a function of the delay between a sender and a receiver. http://demonstrations.wolfram.com/EfficiencyVersusDelayForASlidingWindowDataLinkControlProtoco/ Wolfram Demonstrations Project, Published: July 6, 2023.

4. 4. Frost, V. S. “Noise Performance of an FM Demodulator”, created a visual demonstration of the relationship between the pre-detection and post-detection signal-to-noise ratios for a sinusoidal modulated frequency modulation (FM) signal in the presence of additive Gaussian noise.

http://demonstrations.wolfram.com/NoisePerformanceOfAnFMDemodulator/
Wolfram Demonstrations Project, Published: June 12, 2023.

5. Frost, V. S. “Signal Constellation of Eight-Phase Shift-Keying Modulation in Noise”, created a visual demonstration of signal constellation for 8-PSK in noise. http://demonstrations.wolfram.com/SignalConstellationOfEightPhaseShiftKeyingModulationInNoise/, Wolfram Demonstrations Project, Published: July 11, 2023

6. Frost, V. S. “First-Order Digital Filter Design” created a visual demonstration that shows the relationship among the placement of poles and zeros, a 3D plot of the transfer function in the domain with a highlighted unit circle, and the filter's magnitude and phase responses. https://demonstrations.wolfram.com/FirstOrderDigitalFilterDesign/
Wolfram Demonstrations Project, Published: July 24, 2023.

7. Frost, V. S. “Linear Distortion and Signal Bandwidth” created a visual demonstration that shows how the system approaches an ideal system as the ratio of the system to signal bandwidth increases.https://demonstrations.wolfram.com/LinearDistortionAndSignalBandwidth/
Wolfram Demonstrations Project, Published: July 24, 2023.

8. Frost, V. S. “Sampling a Bandpass Signal” created a visual demonstration that shows sampling of a bandpass signal and regions of aliasing.
https://demonstrations.wolfram.com/SamplingABandpassSignal/
Wolfram Demonstrations Project, Published: August 7, 2023.

9. Frost, V. S. “Signal Constellation of Quadrature Phase Shift Keying Modulation in Noise”, created a visual demonstration of signal constellation for QPSK in noise.
https://demonstrations.wolfram.com/SignalConstellationOfQuadraturePhaseShiftKeyingModulationInN/ Wolfram Demonstrations Project, Published: August 7, 2023.

10. 10. Frost, V. S., “Impulse Response and Transfer Function of a Raised Cosine Filter” created a visual demonstration of showcases the zero-crossing property of the raised cosine pulse.
https://demonstrations.wolfram.com/ImpulseResponseAndTransferFunctionOfARaisedCosineFilter/ Wolfram Demonstrations Project, Published: August 7, 2023.

11. Frost, V. S. “Constructing an Eye Diagram” created a visual demonstration of showcases the build an eye diagram.
https://demonstrations.wolfram.com/ConstructingAnEyeDiagram/
Wolfram Demonstrations Project, Published: August 7, 2023.

12. Frost, V. S. “Second-Order Digital Filter Design” created a visual demonstration that shows the relationship among the placement of poles and zeros, a 3D plot of the transfer function in the domain with a highlighted unit circle, and the filter's magnitude and phase responses.
https://demonstrations.wolfram.com/SecondOrderDigitalFilterDesign/
Wolfram Demonstrations Project, Published: August 7, 2023.

13. Frost, V. S. “Whitening of a Multivariate Gaussian Random Vector” created a visual demonstration that shows the whitening process, that is, transforming a random vector with a known covariance matrix into a new random vector with a covariance matrix equal to the identity matrix. https://demonstrations.wolfram.com/WhiteningOfAMultivariateGaussianRandomVector/
Wolfram Demonstrations Project, Published: August 14, 2023.

14. Frost, V. S. “Intersymbol Interference with Raised Cosine Pulses” created a visual demonstration that illustrates ISI and the zero-crossing property of raised cosine pulse shaping, highlighting the relationship among ISI, the symbol rate and Nyquist bandwidth. https://demonstrations.wolfram.com/IntersymbolInterferenceWithRaisedCosinePulses/ Wolfram Demonstrations Project, Published: August 29, 2023.

15. Frost, V. S. “Linking Autocorrelation of Gaussian Random Process to Conditional Probabilities” created a visual demonstration to show the connection between the autocorrelation function (or power spectral density) and the conditional probability $P(X(t+\tau)>L|X(t)=y)$ here https://demonstrations.wolfram.com/IntersymbolInterferenceWithRaisedCosinePulses/ Wolfram Demonstrations Project, Published: September 6, 2023.

16. Frost, V. S. "Average Throughput of a TCP Connection with Bit Errors" created a visual demonstration to show the average transport control protocol (TCP) throughput in Mb/s for TCP Reno with bit errors as the end-to-end round-trip time and maximum segment size (bytes) change here https://demonstrations.wolfram.com/AverageThroughputOfATCPConnectionWithBitErrors/ Wolfram Demonstrations Project, Published: 2024.

17. Frost, V. S. "Normalized CSMA/CD Network Delay versus Load” created a visual demonstration to show the average normalized delay for a CSMA/CD network as a function of load as the packet length, size of network and link rate changes here https://demonstrations.wolfram.com/NormalizedCSMACDNetworkDelayVersusLoad/ Wolfram Demonstrations Project, Published: 2024.

18. Frost, V. S. “Removing Tone Interference from a Speech Signal” created an audio/visual demonstration to show the removal of a tone interfering signal from a speech signal. https://demonstrations.wolfram.com/RemovingToneInterferenceFromASpeechSignal/ Wolfram Demonstrations Project, Published: 2024.

19. Frost, V. S. “Finite Impulse Response (FIR) Filter Design by Frequency Sampling” created a visual demonstration finite impulse response (FIR) filter design by frequency sampling comparing the magnitude responses and computational requirements of IIR and FIR filters as a function of the number of taps for first- and second-order systems. https://demonstrations.wolfram.com/FiniteImpulseResponseFIRFilterDesignByFrequencySampling/ Wolfram Demonstrations Project, Published: 2025

20. Frost, V. S., “Spectrum at the Output of a Nonlinearity” created a visual demonstration the spectrum at the output of a ideal nonlinearity. https://demonstrations.wolfram.com/SpectrumAtTheOutputOfANonlinearity/ Wolfram Demonstrations Project, Published: 2025

21. Frost, V. S., “Mean Square Error Estimation of an AR(1) Signal” created a visual demonstration the linear discrete time minimum mean square filtering of an AR(1) signal in white noise. https://demonstrations.wolfram.com/MeanSquareErrorEstimationOfAnAR1Signal/ Wolfram Demonstrations Project, Published: 2025

22. Frost, V. S., “Mean Square Error Estimation of an MA(2) Signal” created a visual demonstration the linear discrete time minimum mean square filtering of an MA(2) signal in white noise.. https://demonstrations.wolfram.com/MeanSquareErrorEstimationOfAnMA2Signal/ Wolfram Demonstrations Project, Published: 2025

23. Frost, V. S., "Autocorrelation Function and Power Spectral Density of Random Binary Waveforms with Memory", created a visual demonstration of discrete-time random sequence, its associated continuous-time waveform, autocorrelation function and power spectral density. https://demonstrations.wolfram.com/AutocorrelationFunctionAndPowerSpectralDensityOfRandomBinary/
Wolfram Demonstrations Project, Published: 2025

24. Frost, V. S., "Orthogonal Frequency-Division Multiplexing", created a visual demonstration the processing OFDM complex symbols through a channel to demonstrate the effectiveness of the cyclic prefix. https://demonstrations.wolfram.com/OrthogonalFrequencyDivisionMultiplexing/
Wolfram Demonstrations Project, Published: 2025

Other Publications
Total: 2

2. Frost, V. S. (1982). *Information Analysis and Extraction Techniques for Synthetic Aperture Radar Signals*.
For Doctor of Philosophy, University of Kansas, Lawrence, KS

1. Frost, V. S. (1978). *Development of Statistical Models for Radar Image Analysis and Simulation*.
For Master of Science, University of Kansas, Lawrence, KS

Presentations
Total: 49

Invited Presentations/Lectures
Total: 6

6. Frost, V. S. (1995, August 4). *Overview of the MAGIC Testbed*. War Fighters XXI Training Conference, Lawrence, KS.

5. Frost, V. S. (1995, August 2). *Characterization of Over the Shoulder Tool: A Collaborative Application Enabled by the MAGIC High-Speed Network*. MAGIC Technical Symposium, Minneapolis, MN.

4. Frost, V. S. (1995, August 2). *Experiences with ATM Traffic Control in MAGIC*. 1995 MAGIC Technical Symposium, Minneapolis, MN.

3. Frost, V. S. (1995, June 13). *Position Paper*. Workshop on HPCC and Crisis Management, National Research Council, Computer Science and Telecommunication Board, Irvine CA.

2. Frost, V. S. (1992, February 14). *The Future of Telecommunications: Technology*. Creating Tomorrow's Telecommunications Task Force Stakeholder's Forum, Regents Telecommunications Task Force, Topeka, KS.

1. Frost, V. S. (1991, December 2). *Modeling Frameworks and Architectures*. Globecom '91 Workshop on Network Management Techniques and Standards, Globecom '91, Phoenix AZ.

Presentations/Lectures
Total: 43

43. Hajaz, Z. (2014, September 7). *A Method for Analyzing the Impact of Interference on a Wireless Link with OFDM, AMC, HARQ, and a Finite Queue*. 17th International Symposium on Wireless Personal Multimedia Communications, Sydney, Australia. [Refereed]
V. Frost: I was Zaid Hajaz dissertation adviser on this work.

42. Hijaz, Z. (2014, July 25). *The Impact of Interference on an OFDM System with AMC, Hybrid ARQ, and a Finite Queue on End-to-End Performance*. 9th IEEE/IET International Symposium on Communication Systems, Networks & Digital Signal Processing. [Refereed]
V. Frost: I was Zaid Hijaz dissertation adviser on this work.

41. Hijaz, Z. (2014, May 15). *A Method for Estimating the Average Packet Error Rates of Multi-carrier Systems with Interference*. Submitted to 2014 Annual IEEE Communications Quality and Reliability International Workshop, Tucson, AZ.
V. Frost: I was Zaid Hijaz dissertation adviser on this work.

40. Hayyeh, Z., & Frost, V. S. (2012, June 1). *Analysis of the Impact of Covert Communication*. First Great Plains Graduate Student Network Research Summit, Kansas City, MO.

39. Frost, V. (2010, December 10). *Toward the Future Internet*. Future Network Forum, IEEE GLOBECOM 2010, Miami, FL.

38. Fokum, D., DePardo, D., Kuehnhausen, M., Oguna, A., Searl, L., Komp, E., Zeets, M., Deavours, D., Evans, J. B., & Minden, G. J. (2009, December 4). *Experiences from a Transportation Security Sensor Network Field Trial*. 3rd IEEE Workshop on Enabling the Future Service-Oriented Internet – Towards Socially-Aware Networks (EFSOI 09) held in conjunction with IEEE GLOBECOM 2009, Honolulu, HI, USA.

37. Minden, G. J., Evans, J. B., Searl, L. S., Komp, E., Depardo, D., Kuehnhausen, M., Zeets, M., Fokum, D. T., & Oguna, A. N. (2009, February 24). *Service Oriented Architecture for Monitoring Cargo in Motion Along Trusted Corridors*. Poster HotMobile 2009, The Tenth Workshop on Mobile Computing, Systems, and Applications, Santa Cruz, CA, USA.

36. Jabbar, A., Raman, B., Raman, B., & Sterbenz, J. P. G. (2008). *Weather Disruption-Tolerant Self-Optimising Millimeter Mesh Networks*. 3rd International Workshop on Self-Organizing Systems.

35. Sterbenz, J. P. G., Wyglinski, A. M., Mohammad, A. J., Muralidharan, V., & Raman, B. (2007, June 20). *Weather Disruption-Tolerant Millimeter Wave Wireless Mesh: Architecture and Research*. International Wireless Industry Consortium Workshop, Toward Use of Gigabit Millimeter Wave Wireless in Cellular and Enterprise Networks, Dulles, VA.

34. Frost, V. S. (2004, May 21). *Experiences with an Iridium Based Communications System in Polar Regions*. Technical Workshop on Applications of Iridium Telecommunications to Oceanographic and Polar Research, University of Washington, Seattle, WA.

33. Schlesener, M. C., & Frost, V. S. (2003, October 3). *Performance Evaluation of Telephony Routing over IP (TRIP)*. 2003 IEEE Workshop on IP Operations and Management (IPOM), Kansas City, MO.

32. Evans, J. B. (2002, August 20). *Breadth and Experience in Education for Next Generation Networks*. Workshop on Computer Networking: Curriculum Design and Educational Challenges, Pittsburgh, PA.

31. Frost, V. S. (2002, April). *Perspectives on Engineering Education for Next Generation Networks*. Panel on How to Prepare Engineers for Tomorrow's Networks, IEEE ICC 2002, New York, NY.

30. Nyirenda-Jere, T. P. R., & Frost, V. S. (2000, March 9). *Finding Your Shade of Grey on the Network Spectrum*. Sprint Research Symposium 2000, Lawrence, KS.

29. Frost, V. S. (1999, June 22). *An Overview of the Senator Roberts' Advisory Committee on Science, Technology and the Future: Task Force on Information, Telecommunications, and Computing*. University After Next Quarterly Review, Ft. Leavenworth, Leavenworth, KS.

28. Frost, V. S. (1999, June 4). *Modern Communications Networks: Concepts and Simulation*. Tutorial, Garmisch-Partenkirchen, Germany.

27. Frost, V. S. (1999, January 20). *Information Technology: The Unpredictable Certainty*. Kansas House of Representatives, Utilities Committee.

26. Frost, V. S. (1999, January 20). *Information Technology: The Unpredictable Certainty*. Kansas Senate, Commerce Committee.

25. Frost, V. S. (1998, October 23). *Communications Networks*. Tutorial, Barcelona, Spain.

24. Evans, J. B., Frost, V. S., Minden, G. J., Kulkarni, A., & Deendar, I. (1998, August). *Active Networks and Wireless Adaptation*. Cross-Industry Workshop on End-to-End Wireless Integration, Menlo Park, CA.

23. Evans, J. B., & Minden, G. J. (1998, March). *Service Independent Access Points (SIAP) to Optical Wide Area Networks*. 1998 IEEE Gigabit Networking Workshop.

22. Frost, V. S. (1998, March 20). *Performance Measurements on National Scale ATM Network*. Second Annual Sprint Applied Research Partners Advanced Networking Symposium, Nichols Hall, University of Kansas, Lawrence, KS.

21. Frost, V. S. (1998, February 20). *Trends in Telecommunications Technology*. Kansas House of Representatives, Utilities Committee.

20. Kulkarni, A. B., Minden, G., Frost, V. S., & Evans, J. (1997, September 27). *An Active Network Architecture for ATM WANs*. 3rd International Workshop on Mobile Multimedia Communications, Princeton, NJ.

19. Frost, V. S. (1997, August 8). *Introduction to Communications Networks*. Tutorial presented at TRW, Redondo Beach, CA.

18. Frost, V. S. (1996, October 10). *Industry/University/Government Partnership in Information and Telecommunications Research*. Second Annual Regional SBIR/EPSCoR Conference.

17. Evans, J. B., Frost, V. S., Niehaus, D., Jonkman, R., Dasilva, L., Lee, B., & Lazarou, G. (1996, June 20). *AAI ATM WAN Performance Tools, Experiments, and Results*. 1996 DARPA Workshop on Wide-Area ATM Performance, Lawrence, KS.

16. Frost, V. (1996, June 4). *Experiences with Wide-Area ATM Networking: From Hardware Development to System Performance*. 18th Biennial Symposium on Communications, Queen's University, Kinston, Ontario, Canada.

15. Frost, V. S. (1996, January 29). *KU/TISL & Sprint: A Successful Industry/University Partnership*. State of Kansas House Committee on Economic Development, Topeka, KS.

14. Frost, V. S. (1996, January 29). *KU/TISL & Sprint: A successful Industry/University Partnership*. Kansas House of Representatives, Economic Development Committee.

13. Frost, V. S., & Kosbar, K. (1994). *Computer-Aided Analysis and Design of Communications Systems*. Half-day tutorial, 1994 IEEE Global Communications Conference.

12. Frost, V. (1994, October 23). *The MAGIC Testbed and Access to Future Public Switched Networks*. IEEE Symposium on Planning and Design of Broadband Networks, Montebello, Quebec, Canada.

11. Frost, V. S., & Kelley, T. (1992, October 2). *Validation of a Modified Source Routing Protocol Providing Route-Reconfiguration Using Discrete Event Simulation*. Fourth IEEE Communications Society Workshop on Computer-Aided Modeling of Communications Links and Networks, Montebello, Canada.

10. Frost, V. S. (1992, June 30). *Introduction to High Speed Networks*. Kansas City IEEE Section Workshop on High Speed Networks, Overland Park, KS.

9. Frost, V. S. (1991, November 20). *Applications and Technologies Showcase: New techniques for the design and management of communications and computer networks*. Featured Speaker for the COMDISCO Systems, Inc. Technical Seminar Series, Bedford, MA.

8. Frost, V. S., Tranter, W., & Kosbar, K. (1990). *Computer-Aided Analysis and Design of Communications Systems*. One-day tutorial, 1990 IEEE Military Communications Conference.

7. Frost, V. S., & Saurez, G. (1990, September 28). *The Impact of Modeling Abstraction on Network Simulation*. Third IEEE Communications Society Workshop on Computer-Aided Modeling of Communications Links and Networks, Torino, Italy.

6. Frost, V. S., & Shanmugan, K. S. (1990, September 28). *A Discussion of Modeling Paradigms for Communications Network Simulation*. Third IEEE Communications Society Workshop on Computer-Aided Modeling of Communications Links and Networks, Torino, Italy.

5. Frost, V. S. (1990, May 16). *The Evolution of the Telecommunications Network*. Southwestern Bell Stakeholders Symposium on Telecommunications, University of Kansas, Lawrence, KS.

4. Frost, V. S., & LaRue, W. W. (1988, October). *Performance Extrapolation Techniques for*

HDLC Links and Networks. Second IEEE Communications Society Workshop on Computer-Aided Modeling of Communications Links and Networks, Univ. of Massachusetts, Amherst, MA.

3. Frost, V. S., Tranter, W., & Shanmugan, K. S. (1986). *Computer-Aided Analysis and Design of Communications Systems*. One-day tutorial, 1986 IEEE Military Communications Conference.

2. Frost, V. S., & Shanmugan, K. S. (1986, May 8). *Computationally Efficient Procedures for the Simulation of Computer Networks*. IEEE Communications Society Workshop in Computer-Aided Modeling, Analysis and Design of Communications Links and Networks, The University of Kansas, Lawrence, KS.

1. Frost, V. S., Shanmugan, K. S., Holtzman, J. C., Minden, G. J., & Townsend, C. (1985, September). *Communications Systems Simulation: Theory, Applications and Design Examples*. Coventry Polytechnic Conference, Coventry, England.

Research Funding/Fellowships

University of Kansas

Externally-Funded Grant/Contract

Funded

Hashemi, M(Principal), Keshmiri, S. (Co-Investigator), Frost, V, (Co-Investigator), “IMR: MT: AirScope: A Versatile and Programmable UAV Platform for End-to-End Cellular Network Measurements in Rural Environments” 2323189 National Science Foundation, $600,000, (October 1, 2023-Sept 30, 2025).

Luo, B. (Principal), Li, F. (Co-Principal), Alexander, P. (Co-Investigator), Frost, V. S. (Co-Investigator), "CyberCorps: New Scholarships for Service (SFS) Program at the University of Kansas - Jayhawk SFS," DGE 1565570 National Science Foundation, $1,197,646, Submitted December 8, 2015 (January 1, 2016 - December 31, 2024).

Branicky, M. (Principal), Frost, V. S. (Co-Investigator), Luo, B. (Co-Investigator), Alexander, P. (Co-Investigator), "Planning IUCRC University of Kansas: Center for High-Assurance Secure Systems and IoT (CHASSI)," 1916732 National Science Foundation, $14,999 (October 1, 2019 - September 30, 2021).

Frost, V. S. (Principal), "Exploiting Adaptive Protocols in Packet-Based Broadband Wireless Networks," NSF Grant CNS-1216132 NSF, $377,997 (August 1, 2012 - July 31, 2016).
Base Amount: $330,000
REU Supplement Summer 2013: $15,999
REU Supplement Summer 2014: $15,999
REU Supplement Summer 2016: $15,999

Frost, V. S. (Principal), "GENI-FIRE Workshop," NSF Award CNS-1058521 National Science Foundation, $80,000, Submitted August 1, 2010 (September 1, 2010 - September 1, 2015).

Frost, V. S. (Principal), "NSF IPA," NSF, $702,292 (February 9, 2009 - February 8, 2011).

Frost, V. S. (Co-Investigator), Evans, J. (Principal), Minden, G. (Co-Investigator), Tsatsoulis, C. (Co-Investigator), "Rail Sensor Testbed Active Agents in Containers for Transport Chain Security," Office of Naval Research, $1,217,000 (June 25, 2007 - December 31, 2010).

Frost, V. S. (Co-Investigator), Minden, G. (Principal), Evans, J. (Co-Investigator), Deavours, D. (Co-Investigator), "A Unified Architecture for SensorNet with Multiple Owners: Supplement to Advance SensorNet Technologies to Monitor Trusted Corridors," Oak Ridge National Laboratory, $816,178 (June 15, 2007 - September 30, 2010).
Amount: $1,541,588 (KU $816,178).

Frost, V. S. (Principal), "Robust Wireless Mesh Networking Research: Extension to 23GHz," Sprint, $63,000 (October 15, 2007 - October 14, 2008).

Frost, V. S. (Principal), "Robust Millimeter Wave Metropolitan Mesh Network," Sprint, $169,310 (April 1, 2007 - March 13, 2008).

Frost, V. S. (Principal), "Development of Technologies for Trusted Corridors," KU Transportation Research Institute (through US DoT grant), $174,706 (August 18, 2006 - December 15, 2007).

Frost, V. S. (Principal), "Quantifying the Temporal Characteristics of Congestion Events in the Internet," National Science Foundation, $286,267 (September 1, 2002 - August 30, 2007).
Base Amount: $249,807
REU Supplement: $36,460

Frost, V. S. (Co-Investigator), Minden, G. (Principal), Petr, D. (Co-Investigator), Niehaus, D. (Co-Investigator), Deavours, D. (Co-Investigator), "A Unified Architecture for SensorNet with Multiple Owners," Oak Ridge National Laboratory, $929,655 (August 15, 2005 - August 15, 2007).

Frost, V. S. (Principal), "Development of an Integrated Bioinformatics Information Infrastructure," US Army, $2,147,000 (September 29, 2004 - December 31, 2006).

Frost, V. S. (Co-Investigator), Gogineni, P. (Principal), Allen, C. (Co-Investigator), Prescott, G. (Co-Investigator), Agah, A. (Co-Investigator), Braaten, D. (Co-Investigator), Tsatsoulis, C. (Co-Investigator), "Large ITR-A Mobile Sensor Web for Polar Ice Sheet Measurements," NSF, NASA, KTEC, $8,715,000 (October 1, 2001 - September 30, 2006).

Frost, V. S. (Principal), "In-Service Monitoring for Congestion Events in IP Networks," Sprint, $25,000 (June 30, 2005 - July 1, 2006).

Frost, V. S. (Principal), "A Computing Facility for Bioinformatics and Life Sciences Research," US Dept. of Health and Human Service, Health Resources and Services Adm., $492,000 (September 1, 2004 - August 31, 2005).

Frost, V. S. (Co-Principal), Johnson, T. (Co-Principal), "Center of Excellence: Information and Telecommunications Technology Center," KTEC, $3,499,802 (July 1, 2000 - June 30, 2005).
Period of Performance: Continuing.

Frost, V. S. (Principal), "Development Multilink PPP Technologies," Harris Corporation-Government Communications Systems Division, $14,133 (September 1, 2003 - October 31, 2003).

Frost, V. S. (Co-Investigator), Evans, J. (Principal), "Network Monitoring for Performance Analysis and for Enabling Network-Aware Applications," Department of Energy, $502,797 (July 15, 1999 - July 14, 2002).

Frost, V. S. (Principal), "Wireless Smart Devices and their Coordination," Ambient Computing Inc., $25,103 (January 1, 2002 - June 30, 2002).

Frost, V. S. (Principal), Niehaus, D. (Co-Principal), "Complexity, Implementation, and Management Trade-offs for Traffic Aggregation in Future Networks," Sprint Corp., $170,000 (June 15, 2000 - June 14, 2001).

Frost, V. S. (Co-Investigator), Evans, J. (Principal), Minden, G. (Principal), "Ambient Computing Environments," Sprint, $360,000 (April 1, 2000 - May 29, 2001).

Frost, V. S. (Principal), "Network Capacity Trade-offs for Traffic Aggregation in Future Networks," Sprint Corp., $50,000 (May 1, 2000 - April 30, 2001).

Frost, V. S. (Principal), "Engineering the Next Generation of Communications Networks: Proposal for Sabbatical Support," Sprint Corp., $128,610 (August 16, 1999 - July 31, 2000).

Frost, V. S. (Principal), "Interworking and Traffic Management for Advanced Networks," Sprint Corp., $273,357 (July 21, 1999 - June 30, 2000).

Frost, V. S. (Co-Investigator), Niehaus, D. (Principal), "Enhancement of the KU PNNI Performance Evaluation Tools," Sprint TP&I and NP&D, $419,600 (January 1, 1999 - December 31, 1999).

Frost, V. S. (Co-Investigator), Evans, J. (Principal), "ALL2 Call/Connection Control Signaling," Sprint, $235,900 (January 1, 1998 - December 31, 1999).

Frost, V. S. (Co-Investigator), Evans, J. (Principal), "Broadband Wireless Local Loop," Sprint, $431,800 (January 1, 1998 - December 31, 1999).

Frost, V. S. (Co-Investigator), Evans, J. (Principal), Shanmugan, K. S. (Principal), "Rapidly Deployable Radio Network (RDRN)-Phase II," DARPA, $1,499,074 (June 20, 1997 - December 19, 1999).

Evans, J. (Principal), Frost, V. S. (Co-Principal), Richer, I. (Co-Principal), "MAGIC-II: A Large-Scale Internetwork Supporting High Speed Distributed Storage, Processing and Applications," ARPA, $777,707 (August 1996 - January 14, 1999).
Subcontractors: CNRI, MITRE, SRI International, Minnesota Supercomputer Center.
Amount of Prime Contract: $3,414,743
Amount of KU component-J. Evans Principal Investigator: $777,707

Frost, V. S. (Co-Principal), Evans, J. (Co-Principal), Niehaus, D. (Co-Principal), Petr, D. (Co-Principal), "Determination of the Impact of Advanced Traffic Controls on the Performance of Edge/Core ATM Network Architectures," Sprint Corp., $893,660 (January 1, 1997 -

December 31, 1998).

Frost, V. S. (Co-Principal), Demarest, K. (Co-Principal), "Research on Lightwave Communications Systems," Sprint Corp., $2,690,018 (January 1, 1996 - December 31, 1998).

Frost, V. S. (Co-Investigator), Evans, J. (Principal), "Wireless ATM Adaptive Voice/Data Networks," Integrated US Air Force Rome Labs, $408,842 (September 30, 1995 - December 31, 1998).

Frost, V. S. (Co-Investigator), Demarest, K. (Principal), "Establishment of a Lightwave Laboratory for Applications Focused Research," NSF and Kansas Technology Enterprise Corporation, $1,056,120 (August 1, 1996 - July 31, 1998).
NSF/EPSCoR $643,603, KTEC $412,517.

Frost, V. S. (Principal), "ACTS ATM Internetwork," DARPA (Prime contractor - Sprint Corp.), $658,691 (July 1, 1994 - June 30, 1998).

Frost, V. S. (Co-Investigator), Evans, J. (Principal), "Performance Tuning Study and Tools for Computers Systems Connected to the DREN," Space and Naval Warfare Systems Command-San Diego, $24,500 (November 1, 1997 - April 30, 1998).

Frost, V. S. (Principal), "Advanced ATM Research," NEC, $100,000 (January 1, 1997 - December 31, 1997).

Frost, V. S. (Co-Investigator), Evans, J. B. (Principal), "A Wireless Extension to the ACTS ATM Internetwork," Sprint, $522,343 (January 1, 1995 - December 31, 1997).

Frost, V. S. (Co-Investigator), Petr, D. W. (Principal), "Traffic Management and Controls for ATM Networks," Sprint, $466,200 (January 1, 1995 - December 31, 1997).

Frost, V. S. (Co-Investigator), Roberts, J. (Principal), "CDMA Capacity Assessment for Personal Wireless Communications," Sprint, $150,000 (October 9, 1995 - August 15, 1997).

Frost, V. S. (Co-Investigator), Shanmugan, K. S., "Rapidly Deployable Radio Network (RDRN) Design and Prototyping," ARPA, $1,596,433 (July 1, 1994 - May 30, 1997).

Frost, V. S. (Co-Investigator), Evans, J. (Principal), "Performance Evaluation of IP Firewalls over ATM Networks," Trusted Systems Inc., $9,300 (November 15, 1996 - January 31, 1997).

Frost, V. S. (Co-Investigator), Evans, J. (Principal), "ATM Available Bit Rate Service Simulation Models," Integrated Telecom Technologies (IgT), $35,000 (January 1, 1996 - December 31, 1996).

Frost, V. S. (Principal), "Development of a Large-scale ATM Network Simulation Environment," Sprint Corp., $122,111 (April 20, 1995 - October 19, 1996).

Frost, V. S. (Principal), "Collection and Application of ATM Network Performance Characteristics," Sprint Corp., $274,930 (June 16, 1995 - June 15, 1996).

Frost, V. S. (Co-Investigator), Niehaus, D. (Principal), "ATM Reference Traffic Source," Sprint, $200,000 (May 15, 1995 - December 31, 1995).

Frost, V. S. (Co-Investigator), Niehaus, D. (Principal), "Development and Testing of Advanced Signaling Protocols for ATM Networks," Sprint, $99,974 (October 15, 1994 - October 14, 1995).

Frost, V. S. (Co-Investigator), Minden, G. J. (Principal), "For Equipment in Support of Research on Gigabit Gateways: Access to the Future Public Switched Network," Digital Equipment Corporation, CRINC, and TISL, $98,299 (June 10, 1992 - June 11, 1995).

Frost, V. S. (Principal), "Equipment and Facilities for Research on Gigabit Gateways: Access to the Future Public Switched Network," Digital Equipment Corp., Sprint, Southwestern Bell Corp., Northern Telecom Inc., and Kansas Technology Enterprise Corporation, $960,000 (June 10, 1992 - June 9, 1995).

Frost, V. S. (Principal), "Research on Gigabit Gateways: Access to the Future Public Switched Network," Defense Advanced Research Projects Agency, $565,907 (June 10, 1992 - June 9, 1995).

Frost, V. S. (Co-Investigator), Petr, D. W. (Principal), "Design Rules and Associated Tools for ATM Networks," Sprint Corp. and Kansas Technology Enterprise Corporation, $162,888 (May 16, 1993 - May 15, 1995).

Frost, V. S. (Co-Investigator), Petr, D. W. (Principal), "Voice Transport via ATM Networks," Sprint Corp., $120,900 (August 16, 1993 - August 15, 1994).

Frost, V. S. (Co-Investigator), Minden, G. J. (Principal), "For Equipment in Support of Research on Gigabit Gateways: Access to the Future Public Switched Network," Digital Equipment Corporation, $74,427 (June 10, 1993 - June 11, 1994).

Frost, V. S. (Principal), "Research on Real Time Estimation of Traffic Descriptors for High Speed Telecommunications Networks," Bell Northern Research Inc., $23,700 (May 15, 1993 - December 31, 1993).

Frost, V. S. (Co-Investigator), Petr, D. W. (Principal), "Evaluation of Broadband Networking Technologies," Sprint Corp., $66,462 (May 15, 1992 - May 14, 1993).

Frost, V. S. (Principal), "Research in Technologies in Modeling of Telecommunication Networks," COMDISCO Systems, Inc., $24,966 (November 1, 1991 - June 15, 1992).

Frost, V. S. (Principal), "Development of New Modeling Structures Within the Block Oriented Network Simulator (BONeS)," COMDISCO Systems, Inc., and Kansas Technology Enterprise Corporation, $44,629 (October 1, 1990 - December 30, 1991).

Frost, V. S. (Co-Investigator), Petr, D. W. (Principal), "Analysis and Simulation of Traffic Management Algorithms for Frame Relay/Fast Packet Networks," Sprint International and Kansas Technology Enterprise Corporation, $35,291 (May 1, 1991 - November 8, 1991).

Frost, V. S. (Co-Investigator), Tsatsoulis, C. (Principal), "A Study of the Role of ACTS in Remote Manufacturing Operations," NASA, $45,446 (November 15, 1990 - May 15, 1991).

Frost, V. S. (Co-Investigator), Petr, D. W. (Principal), "Development of Bandwidth Assignment

Algorithms and Performance Simulation Software," Telesat Canada, $25,000 (September 15, 1990 - December 15, 1990).

Frost, V. S. (Principal), "Research in Computer Aided Analysis of Communications Networks Using a New Modeling Paradigm: The Block Oriented Network Simulator (BONeS)," COMDISCO Systems, Inc., and Kansas Technology Enterprise Corporation, $36,471 (December 12, 1989 - December 11, 1990).

Frost, V. S. (Principal), "Support of Future Battle Laboratories CINCUSAREUR Project," SRI, $2,500 (January 15, 1990 - November 15, 1990).

Frost, V. S. (Principal), "Modeling Networked Information Systems," NCR Wichita and Kansas Technology Enterprise Corporation, $82,657 (September 15, 1989 - September 14, 1990).

Frost, V. S. (Principal), "Congestion Control in Mixed Packet Networks Using Speech Processing," AT&T, $35,460 (September 1, 1989 - August 31, 1990).

Frost, V. S. (Co-Investigator), Bulgren, W. G. (Principal), "Network Modeling," AT&T, $30,357 (September 1, 1989 - August 31, 1990).

Frost, V. S. (Co-Investigator), Gogineni, P. (Principal), "Computer Aided Design Meta-Tools," AT&T, $15,000 (September 1, 1984 - August 31, 1990). (Institutional Award)
For purchase of workstation.

Frost, V. S. (Principal), "Presidential Young Investigator Award," AT&T Information Systems Laboratory, $187,500 (July 1984 - 1989).

Frost, V. S. (Principal), "Development of Course on Information Network Planning, Service and Management," AT&T, $25,000 (December 1, 1988 - December 15, 1989).

Frost, V. S. (Principal), "Presidential Young Investigator Award," National Science Foundation, $312,000 (July 1984 - June 1989).

Frost, V. S. (Co-Investigator), Gogineni, P. (Principal), "Development of Software for Interactive Teaching-Learning of Electromagnetic Theory," AT&T, $86,500 (November 1, 1987 - May 1, 1989). (Institutional Award)
Value of 6 AT&T 630 Terminals and a 3B2/500.

Frost, V. S. (Principal), "Efficient Modeling Techniques of Large Heterogeneous LANs," NCR Wichita and Kansas Technology Enterprises Corporation, $37,647 (February 1, 1988 - January 31, 1989).

Frost, V. S. (Principal), "Evaluation of SCSI Systems," NCR Wichita, $9,497 (February 1, 1988 - May 14, 1988).

Frost, V. S. (Co-Principal), Bulgren, W. G. (Co-Principal), "AT&T 1987 University Equipment Donation Program," AT&T, $600,000 (1987). (Institutional Award)
Equipment, software, and maintenance.

Frost, V. S. (Principal), Shanmugan, K. S. (Co-Investigator), "Two Dimensional HF Spatial Baseline," Rome Air Development Center, U.S. Air Force, $100,000 (April 1, 1986 - March

30, 1987).

Frost, V. S. (Co-Principal), Bulgren, W. G. (Co-Principal), "AT&T 1986 University Equipment Donation Program," AT&T, $553,008 (1986). (Institutional Award)
Equipment, software, and maintenance.

Frost, V. S. (Co-Investigator), Shanmugan, K. S. (Principal), "Development of Data Transmission System CAD Package for ITT/ATC," ITT, $35,000 (August 1, 1985 - July 30, 1986).

Frost, V. S. (Co-Investigator), Shanmugan, K. S. (Principal), "RAKE Filter for ICS," Rome Air Development Center, $50,000 (August 1, 1985 - July 30, 1986).

Frost, V. S. (Co-Investigator), Holtzman, J. C. (Principal), Shanmugan, K. S. (Principal), "Development of a Simulation Model to Predict Interference of Spread Spectrum Networks on Non-Spread Spectrum Networks," U. S. Army CSEI, $469,000 (July 1, 1983 - June 30, 1986).

Frost, V. S. (Co-Investigator), Shanmugan, K. S. (Principal), "Advanced Spatially Adaptive Propagation Program," Rome Air Development Center, $54,000 (March 1985 - March 1986).

Frost, V. S. (Principal), Shanmugan, K. S. (Co-Investigator), "A Study of High Capacity Modulation Schemes," Hughes Aircraft Company, $34,975 (July 15, 1985 - December 31, 1985).

Frost, V. S. (Co-Principal), Minden, G. J. (Co-Principal), "AT&T 1985 University Equipment Donation Program," AT&T, $684,375 (1985). (Institutional Award)
Equipment, software, and maintenance.

Frost, V. S. (Principal), "Performance Evaluation of Local Area Networks," AT&T Information Systems, $19,566 (May 15, 1985 - August 15, 1985).

Frost, V. S. (Co-Investigator), Holtzman, J. C. (Principal), "Extension and Installation of the Radar Image Simulation System," Northrop Research Center, $35,000 (January 1, 1985 - June 30, 1985).

Frost, V. S. (Principal), "Analysis of Terrain Scattering Properties for Navigation - Update Systems," McDonnell Douglas Astronautics Company, $22,487 (August 15, 1984 - January 15, 1985).

Frost, V. S. (Principal), "Evaluation of the Interception of FH/PN Waveforms by a Scanning Cross Correlator Receiver," Air Force Office of Scientific Research through subcontract with Southeastern Center for Electrical Engineering Education, $12,000 (November 1, 1983 - October 31, 1984).

Frost, V. S. (Principal), "Research in Information Extraction from Spaceborne Synthetic Aperture Radar Images," NASA Headquarters, $87,770 (November 1, 1982 - October 31, 1984).

Frost, V. S. (Co-Investigator), Moore, R. K. (Principal), "Shuttle Imaging Radar-B (SIR-B) Data Analysis," NASA, $25,000 (June 1984 - September 1984).

Frost, V. S. (Co-Investigator), Holtzman, J. C. (Principal), "Modify, Enhance and Install the

Radar Image Simulation System (RIS) at the DFVLR Facility," German Aerospace Research Establishment/DFVLR, $40,000 (June 1, 1983 - May 31, 1984).

Frost, V. S. (Co-Investigator), Shanmugan, K. S. (Principal), "ICSSM EHF Communication Enhancement," U. S. Air Force/RADC, $50,000 (August 8, 1983 - September 30, 1983).

Frost, V. S. (Co-Investigator), Shanmugan, K. S. (Principal), "Computer Simulation of Spread Spectrum Systems Operating in Jamming Environments," U. S. Air Force/RADC, $50,000 (September 1982 - September 1983).

Frost, V. S. (Co-Investigator), Holtzman, J. C. (Principal), "Modification and Implementation of Data Management Software for Radar Image Simulation," Mitsubishi International Corporation, $30,000 (December 1, 1982 - January 31, 1983).

General Research Fund

Funded

Frost, V. S. (Principal), "Simulation of Adaptive Antennas," University of Kansas General Research Fund, $4,500 (July 1, 1983 - June 30, 1984).

Summary List of Courses Taught

University of Kansas

EECS 360 (now EECS 361) Signal Analysis
EECS 444 Control Systems
EECS 461 Probabilistic Analysis
EECS 562 Introduction to Communications Systems
EECS 663 (now EECS 563) Intro to Communications Networks
EECS 766 Resource Sharing for Broadband Access Networks
EECS 861 Random Signal Theory
EECS 863 Analysis of Communications Networks
EECS 864 Optical Communications Networks
EE 864 Communication System Planning & Design

University Service

University of Kansas

Department

Advocate
For Dr. James Sterbenz promotion to full professor (2013)
For Dr. Daniel Deavours promotion to Research Associate Professor (2008)
For Dr. Susan Gauch promotion to full professor (2003)
For Dr. Ron Hui promotion and tenure (2001)
For Dr. David Petr promotion to full professor (2000)

Chair
Untenured Faculty Committee. (August 15, 2019 - Present)

Digital Communications Faculty Search Committee. (2004 - 2005)
Bioinformatics Faculty Search Committee. (2002 - 2005)
Ad Hoc Committee on Bioinformatics. (2003 - 2004)

Member
CoE Faculty Search Committee. (2019)
Untenured faculty review committee. (2008)
Graduate Recruiting Committee. (2001 - 2002)

Preparer
Prepared the Communications/Networking questions and solutions for PhD qualifying exam (2012 - 2013)
Prepared the Communications/Networking questions and solutions for PhD qualifying exam (2008)
Prepared the Communications/Networking questions and solutions for PhD qualifying exam (2005 - 2006)

School

Chair
School of Engineering Promotion and Tenure Committee. (2000)
EECS Chair Search Committee. (1999)
EECS Chair Review Committee. (1994)

Member
ME Department Chair Search Committee. (Fall 2017 - Spring 2018)
Sharp Professorship Selection Committee. (2004)
School of Engineering Promotion and Tenure Committee. (2001 - 2003)
Miller Awards Committee. (2002)
Engineering School Building Committee. (1999)

University

Alternate member
Temporary Classification Committee. (2001 - 2004)

Chair
Restricted Research Committee. (2013 - 2014)

Coordinator
ITTC KTEC bi-annual peer review. (2001)

Member
Member of Self Graduate Fellowship Board of Trustees. (Appointed) (August 1, 2015 - May 15, 2019)
Executive Council of the Graduate School. (Elected) (representing the School of Engineering) (Fall 2011 - Spring 2014)
Restricted Research Committee. (Fall 2011 - Spring 2014)
Restricted Research Committee. (2006 - 2008)
TRI Director Search Committee. (2006)
Provost Search Committee. (2005 - 2006)

KUCR Promotion Committee. (2004 - 2005)
KUCR Kansas Economic Growth Act (KEGA) Committee. (2004)
Ad Hoc Bioinformatics Committee. (2003 - 2004)
Bioinformatics Director Search Committee. (2003)
Digital Library Advisory Group. (2002)
KU Transportation Executive Committee. (2002)
RDF Review Committee. (2001 - 2002)