Curriculum Vitae

Richard E. Newman, Ph.D.
University of Florida
Computer and Information Science and Engineering
Assistant Professor
Undergraduate Coordinator

RICHARD E. NEWMAN, Ph.D.
Office: Department of Computer and Information Science and Engineering,
301 CSE Building, Room 340, P.O. Box 116120, Gainesville, FL 32611
Home: 4315 NW 36 Street, Gainesville, FL 32605
352-283-1083
nemo@ufl.edu
http://www.cise.ufl.edu/~nemo

BIOGRAPHY

I am a faculty member with the University of Florida's Computer and Information Science and Engineering Department. I completed my M.S. and PH.D. in Computer Science from University of Rochester Computer Science Department in Rochester, N.Y., and earned my B.A. in Mathematics from New College in Sarasota, FL. I also attended Eckerd College in St. Petersburg, FL.

As a faculty instructor, I have taught many courses on cybersecurity; cloud computing; cryptography and steganography; network protocols; powerline communications; distributed systems; anonymity, theory of security, and more recently, on blockchain and cryptocurrency. Twenty years ago I introduced the graduate course on Computer and Network Security to UF, and since then have taught it many times. I worked with other CISE faculty to revamp the security curriculum at UF, and to introduce the graduate information security certificate program. I am currently working to develop an undergraduate information security program as part of an effort to obtain NSA's Center of Academic Excellence in education. Currently, I am working with Raytheon Corporation on a security-related Integrated Product and Process Development (IPPD) project assigned to senior students at UF. Previous projects involved working with Walt Disney World security engineers.

As a faculty researcher, I have published dozens of academic papers on security models, access control, steganography, covert channels, traffic analysis, and cryptographic protocols, and have supervised numerous students now working in the security field. I have worked with Dr. Ira Moskowitz and Dr. Paul Syverson of the Naval Research Laboratory (NRL) Center for High Assurance Computing and Systems on information hiding, covert channels, steganography, and an information theoretic basis for traffic analysis, including analysis of Mix Networks. I led a research team with the department's Software Engineering Center (SERC) and developed collaboration tools for work groups. I was Associate Director of the NASA Center for Space Communication Technology Center (SCTC) and helped lead the UF team that produced node control software for LEO satellite network with laser crosslinks. I currently have several collaborations going on, including one with Dr. Piyush Harsh of ZHAW (Zurich), Dr. Paul Gader and Dr. Aditya Singh of UF on data architectures and cloud computing for a precision agriculture project.

I am also an independent research consultant. Until recently, I was working with Qualcomm Atheros on powerline communications and contributed to the HomePlug Powerline Alliance

standards for in-home access (HomePlug 1.0, HomePlug 1.1, HomePlugAV) and more recently, GreenPHY and vehicular powerline communications. These efforts have also resulted in standards by the IEEE (P.1901 and P.1905) and SAE.

I have also served as an expert witness. I have worked on several patent litigation cases, and have previously given testimony in cases involving distributed systems and network security.

In service, I contributed as department Undergraduate Coordinator since 2015. I have also served as a faculty advisor for Integrated Product and Process Development (IPPD) projects for Raytheon and/or Walt Disney World. I am on the editorial board of the International Journal of Network Management (IJNM). I was co-chair of the 2006 IEEE ISPLC symposium, which was held at Disney's Coronado Springs Resort in Orlando, March 26-29, 2006. I was publications chair of the 2015 IEEE Smart Grid Communications Conference in Miami, FL, November 2-5, 2015.

In my private time, I enjoy playing tennis and frisbee, working on sudoku and crossword puzzles, smoking ribs in the backyard, attending Gator football games, attending and/or officiating at high school, club and college-level swim meets, traveling around the world, renting movies with my wife, and co-parenting three incredibly busy sons (a college drummer, a sous chef, and a college swimmer).

WORK EXPERIENCE

Consultant

Consultant, Raytheon Systems Company, St. Petersburg, FL	05/01/1996 – 8/1/1998
Consultant, Intellon, Inc. / Qualcomm Atheros, Inc., Ocala, FL	08/01/1999 – 11/30/2014
Board of Directors, Fair Warning, Inc., (formerly EpicTide, Inc.), St. Petersburg, FL	08/01/2004 – 05/31/2012
Senior Scientist, Unistry Associates, Inc., Havertown, PA	08/01/1995 – 05/31/1999

Expert Witness

Expert Witness - Patent Litigation (Citrix, Juniper Systems, Bomgar, IV, Lenovo, Alfresco, Electronic Arts, TP Link, Google, SJK)	01/01/2006 - Present

Teaching and Academic Experience

Assistant Professor, UF- CISE Department, Gainesville, FL	08/01/1986 - Present

Cryptology Instructor, Johns Hopkins Center for Talented Youth,
Lancaster, PA   06/30/2017 - 08/01/2017

Cryptology Instructor, Johns Hopkins Center for Talented Youth,
Saratoga Springs, NY   06/01/2018 – 08/01/2018

Associate Director, Space Communication Technology Center,
Digital Signal Handling and Satellite Networking Technical Area,
University of Florida, CISE Department, Gainesville, FL   08/01/1991 – 06/01/1997

EDUCATION

Ph.D., University of Rochester, Rochester, NY   1986

M.S., Computer Science, University of Rochester, Rochester, NY   1983

B.A., Mathematics, New College, Sarasota, FL   1981

PATENTS (17)

1. S. Schrum, L. W. Yonge III, and R. Newman, Efficient Datagram Segmentation and Re-assembly for Packet-Switched Networks, No. 20170034067, July 27, 2015.

2. S. Schrum, L. W. Yonge III, S. Katar, H. Zhu, and R. Newman, Slotted Message Access Protocol for Powerline Communication Networks, No. 20150372996, December 24, 2015

3. S. Katar, L. W. Yonge III, and R. Newman, Attenuation Level Based Association in Communication Networks, No. 20130038424, February 14, 2013

4. R. Newman and P. R. Rajkotia, Enhanced Acknowledgement and Retransmission Mechanism, No. 9,432,251, August 30, 2016

5. L. W. Yonge III, S. Katar, and R. Newman, Managing Communications Over a Shared Medium, No. 9,385,966, July 5, 2016

6. S. Schrum and R. Newman, Packet Ordering Based on Delivery Route Changes in Communication Networks, No. 9,059,932, June 16, 2015

7. S. Katar, L. W. Yonge III, and R. Newman, Network Association of Communication Devices Based on Attenuation Information, No. 9,021,278, April 28, 2015

8. S. Katar, L. W. Yonge III, and R. Newman, Secure Client Authentication and Service Authorization in a Shared Communication Network, No. 9,003,492, April 7, 2015

9. S. Schrum and R. Newman, Discovery of Conventional Devices and Bridges in Hybrid Communication Networks, No. 8,897,169, November 25, 2014

10. S. Schrum and R. Newman, Multiple Delivery Route Packet Ordering, No. 8,824,477, September 2, 2014

11. R. Newman and L. W. Yonge III, Establishing Shared Information in a Network, No. 8,751,810, June 10, 2014

12. R. Newman, S. Schrum, and L. W. Yonge III, Hybrid Networking Master Passphrase, No. 8,745,695, June 3, 2014

13. L. W. Yonge III, S. Schrum, and R. Newman, Hybrid Networking Simple-Connect Setup Using Proxy Device, No. 8,745,137, June 3, 2014

14. L. W. Yonge III, S. Schrum, and R. Newman, Hybrid Networking Simple-Connect Setup Using Forwarding Device, No. 8,743,903, June 3, 2014

15. L. W. Yonge III, S. Katar, and R. Newman, Managing Communications Over a Shared Medium, No. 8,503,480, August 6, 2013

16. R. Newman and L. W. Yonge III, Establishing Shared Information in a Network, No. 8,261,079, September 4, 2012

17. R. Newman and L. W. Yonge III, Establishing Shared Information in a Network, No. 7,664,955, February 16, 2010

PROFESSIONAL MEMBERSHIPS (Current)

Member of IEEE

Member of IEEE – Communications Society

Member of IEEE – Computer Society (ComSoc)

Member of IEEE – Information Theory Society

Member of IEEE – Intelligent Transportations Systems Society

Member of IEEE – Photonics Society

Member of IEEE – Vehicular Technology Society

Member of ACM

Member of ACM – SIG Algorithms and Computation Theory

Member of ACM – SIG Artificial Intelligence

Member of ACM – SIG Data Communications

Member of ACM – SIG Computer Science Education

Member of ACM – SIG Information Technology Education

Member of ACM – SIG Operating Systems

Member of ACM – SIG Security, Audit and Control

Member of USENIX

SERVICE

UF CISE Department Undergraduate Coordinator, 2015 – Present

Faculty Advisor, Integrated Product and Process Development (IPPD) projects, 1995 – Present

Associate Director, NASA Center for Space Communication Technology Center (SCTC)

Editorial board of the International Journal of Network Management (IJNM)

Co-chair of the 2006 IEEE ISPLC symposium, which was held at Disney's Coronado Springs Resort in Orlando, March 26-29, 2006

Publications chair of the 2015 IEEE Smart Grid Communications Conference in Miami, FL, November 2-5, 2015

Member, Upsilon Pi Epsilon Computer Science Honorary Fraternity

Faculty Advisor, Theta Tau Engineering Honors Fraternity

Faculty Advisor, Alpha Phi Omega National Service Fraternity

Faculty Advisor, Gator Blockchain Club (formerly Bitcoin Club)

HONORS AND AWARDS

University Superior Accomplishment Award for Faculty Service, University of Florida, 1995-1996.

Superior Accomplishment Award, Academic Affairs, University of Florida, 1996.

Teaching Improvement Program Award, College of Engineering, University of Florida, 1995.

ACM Teacher of the Year, CISE Department, 1994-1995.

Distinguished Service Key, Alpha Phi Omega National Service Fraternity, 1991.

Faculty of the Year, CIS Department, 1989-1990.

RELATED COURSES TAUGHT AT UF

Graduate
Networks
Powerline Communication Networks
Operating Systems
Distributed Systems
Algorithms
Formal Languages and Automata
Complexity Theory
Computer and Network Security
Cryptography
Computer and Information Security

Undergraduate
Networks
Operating Systems
Programming 2 (C++)
Data Structures and Algorithms
Computer and Network Security
Cryptography
Introduction to Cybersecurity
Computer and Information Security

Special Topics
Distributed Systems
Cryptographic Protocols
Cryptographic Anonymity
Digital Currencies
Blockchains and Applications

STUDENTS SUPERVISED (Chair or Co-Chair)

Ph.D. (20)

KIRKMAN,STEPHEN S	Cloud Security/Blockchain	current
CHUCHAISRI,PANOAT	Cryptography/Distributed Systems	8/14/2012
KUMAR,MAHENDRA	Information Hiding	8/9/2011
HARSH,PIYUSH	Networks/Distributed Systems	8/10/2010
ARSLAN,BEKIR	Cryptography/Distr. Syst	12/22/2009
YU,INKWAN	Networks	12/22/2009
ASGHARI,HOSSEIN	Networks	5/6/2006
KATAR,SRINIVAS	Networks	5/6/2006
MANIAN,VIJAY	CSCW/Security	12/17/2005
LEE,MINKYU	Networks	12/18/2004
ONBILGER,OGUZ KAAN	Security/Distributed Systems	12/18/2004
VORAPANYA,ANEK	CSCW/Security	8/1/2000
RAVINUTALA,SEKHAR	Distributed Systems	5/1/1996
PARK,HYUN	Networks	8/1/1996
VENKATRAMAN,BALAJI R	Information Hiding	5/1/1995
GREENWALD,STEVEN J	Security/Distributed Systems	8/1/1994
JOHMANN,KURT R	Programming Languages	5/1/1992
KLOSTERMEYER,WILLIAM F	Distributed Systems	5/1/1992
LUO,CHIH-KEN L	Networks/Distributed Systems	12/1/1991
MCLOCHLIN,CHARLES D	Networks	5/1/1989

M.S. (99)

JAYARAMAN,PRASHANT	Distributed Systems	5/6/2006
NALLA,VIPAN REDDY R	Information Hiding	12/18/2004
KOMARAGIRI,VIJAYA	CSCW/Distributed Systems	8/7/2004
HITCHCOCK,DAVID CHARLES	Security	12/20/2003
YEAGER,PHILIP S	Distributed Systems	12/20/2003
GOPALAKRISHNAN,J	Networks	8/9/2003
AHMED,WADOOD A	Distributed Systems	5/3/2003
KATAGERI,SUCHINDRA P	Networks	5/3/2003
ARINGUNRAM,RAVICHANDRAN D	CSCW/Security	12/21/2002
BRAHMADESAM,MURALI M	Networks	12/21/2002
CHENGALVARAYAN,M	Networks/Security	12/21/2002
KAKARPARTI,APARNA	CSCW	12/21/2002
KARKERA,AKHIL N	Networks/Security	12/21/2002
MANIAN,VIJAY	CSCW/Security	12/21/2002
RAMASUBRAMANIAM,VENKATA	Networks	12/21/2002
TAN,MEIFANG	Distributed Systems	12/21/2002
BHALANI,ASHISH DHIRAJLAL	Networks	8/1/2002
HUO,JING	Networks	8/1/2002
VOKKAARNE,VIJAY	Networks	8/1/2002
CHEN,LIJUN	Distributed Systems	5/1/2002
GRINDLINGER,DAVID M	Security/Networks	5/1/2002
DATE,AMIT V	Networks	12/1/2001
GANDRE,AMIT P	Security/Networks	12/1/2001
SURYADEVARA,USHA	Networks	12/1/2001
XIE,DONGQING	Security/Networks	12/1/2001
CHEN,JIN	Distributed Systems	8/1/2001
SHUKLA,SWATI PATANJALI	Security/Networks	12/1/2000

SIRUPA,KIRAN	Security/Networks	12/1/2000
BALASUBRAMANIAN,SEETHARAMAN	Security/Networks	8/1/2000
ZHENG,WEI	Distributed Systems	8/1/2000
SORBEL,JAYMES HERBERT	Networks	5/1/2000
ZHANG,WENQIU	Security/Networks	12/1/1999
DESAI,PARAMTAP PRAKASH	Security/Networks	5/1/1999
HOYT,MARK VAN	Security	5/1/1999
SALZMANN,CHRISTOPHE	Networks	5/1/1999
CAO,XIAOXI	Networks	12/1/1998
EKSIOGLU,OGUZ	Networks/Security	8/1/1998
SHANDS,DAYATRA NERISSA	Networks	8/1/1998
YANG,BO	Networks	8/1/1998
YANG,CHANGLU	Distributed Systems	5/1/1998
YARRAMREDDY,SUSHMALA	Distributed Systems	5/1/1998
KESKI,TOLGA	Networks	8/1/1997
TUMULURU,SUDHEER	Networks	8/1/1997
ASGHARI,HOSSEIN	Networks	5/1/1997
ORELLANA,ANYMIR MARIA	CSCW	5/1/1997
DAVIS,DARIN ALLEN	Networks/Algorithms	12/1/1996
DOTY,ERIN G	Networks	8/1/1996
NARLA,ARCHANA RAO	Distributed Systems	8/1/1996
SRINIVASAN,MEERA KAMAKSHI	Networks	8/1/1996
KAPUR,DIVYA	Security	5/1/1996
LI,LING	Security	12/1/1995
GHAYALOD,MANISH P	Distributed Systems	5/1/1995
MUKHOPADHYAY,SATYARAN	Networks	5/1/1995
SPECTOR,STEPHEN M	Distributed Systems	5/1/1995
SANCHEZ,MARIA	Distributed Systems	12/1/1994
SUNDARA,BALAJI	Networks	8/1/1994
THIRUMOORTHYSAMY,S	Distributed Systems	8/1/1994
RAMARAO,RAVIKUMAR M	Distributed Systems	5/1/1994
SESHADRI,CHITRANK	Networks	5/1/1994
BAYYA,RAVI SHANKAR	Networks	5/1/1994
BROTHERS,JOHN DAVID	Distributed Systems	12/1/1993
SHANBHAG,SANTOSH S	Networks	12/1/1993
NEELY-RITZ,JODI MARIE	Simulation	8/1/1993
HUSSAINI,SALEEM F	Networks	5/1/1993
SUPPE,DENNIS R	Networks	5/1/1993
ACHARYA,MADHU K	Networks	12/1/1992
VENKATRAMAN,BALAJI R	Networks	12/1/1992
HWANG,MOONJU	Networks/Security	12/1/1992
TIRUPATI,CHENCHU BH K	Networks	8/1/1992
HASAN,TAQI	Networks	12/1/1991
PELIMUHANDIRAM,HARSHA K	CSCW/Distributed Systems	12/1/1991
JACKSON,WILLARD C	Networks	12/1/1991
LIM,SOON LYE	Artificial Intelligence/Networks	8/1/1991
RAMIREZ,CARMEN L	CSCW/Distributed Systems	5/1/1991
WEBB,MICHAEL LAWRENCE	CSCW/Distributed Systems	5/1/1991
WAGNER,CHRISTOPHER G	Networks	8/1/1990
DAVIS,STEVEN L	Algorithms	12/1/1989
SMITH,GWENDOLYN S	Artificial Intelligence	12/1/1989
KLOSTERMEYER,WILLIAM F	Algorithms	5/1/1989
MCDONALD,JEANNE B	Databases	5/1/1989

GILBERT,JEAN	Algorithms	12/1/1988
MIRKIS,ANDREW	CSCW/Distributed Systems	8/1/1988
GONZALES,MARIA V	Networks	4/1/1988
FURR,ROBERT A	Networks	12/1/1987
GARCIA,NORBERTO, JR.	Networks	12/1/1987
HWANG,AIHWA A	Networks	12/1/1987
RAHMAN,JAMIL	Networks	8/1/1987
GAO,ZHUOMIN	Networks	5/1/2002
SINGH,RAVINDER P	Distributed systems	5/1/2002
LIU,TAN	Networks	5/1/2002
MARTIN,NEERAJ	Systems	12/1/2001
ZHONG,LIANG	Distributed systems	8/1/2000
YANG,JI	Networks	12/1/1999
ZHAO,JING	Distributed systems	12/1/1999
VEGULLA,PRAVEEN	Networks	8/1/1997
ZONG,JING	Distributed systems	5/1/1997
CHANG,YUNG-SHUN	Networks	5/1/1997
GUERRA,CARLOS E	Networks	5/1/1997
BLECKEN,CARSTEN	Networks	8/1/1996

M.E. (14)

SIMONEAU,BRIAN R	Security	5/3/2003
KONG,DAN	Security	12/1/2000
YU,DAN	Networks	12/1/1998
SHAFFER,ERIC W	Programming Languages	8/1/1998
PU,JIAN D	Databases	12/1/1996
YU,JIE	Databases	8/1/1996
HAIDER,NADEEM	Networks	5/1/1996
MERRILL,TODD ARTHUR	Networks	5/1/1995
WILSON,DAVID L	CSCW	5/1/1994
SACHDEV,NEENU	Security	12/1/1993
HARATHI,KRISHNA	Networks	5/1/1993
MONTES,MARIO A	CSCW/Distributed Systems	8/1/1992
GREYWOODE,EMILE T	Databases	5/1/1990
DYBEVICK,MICHAEL H	Networks	4/1/1988

M.A.U.R. (1)

VON PALESKE,STEFANIE	Planning	12/1/1991

RESEARCH AND CONSULTING INTERESTS

Security

Cloud security, cross-domain policy implementation, access control models, cryptography, cryptanalysis, cryptographic protocols, cryptocurrencies, anonymity, information hiding, traffic analysis and TAP, cross-layer security, anomaly detection, adaptive security, biometric authentication, image-based authentication, usability.

Networks

Protocols (link, medium access, network, transport, application layers), protocol analysis, performance, traffic modeling, simulation, architecture, topology, quality of service, heterogeneous LANs, error correction, error modeling, latency, network security, user-level security in consumer systems.

Distributed Systems

Blockchain, security, peer-to-peer systems, distributed storage systems, communication architecture and protocols, distributed conferencing, groupware, protocols for concurrent data access, concurrent editing, distributed operating systems, digital currency.

RESEARCH PROJECTS (ACADEMIC AND/OR INDEPENDENT)

1) Cloud Computing (UF)

Information services have come full circle, from the mainframe to workstations and servers and now back to utility-oriented cloud computing. However, unlike services from a single provider, cloud federations may move storage and computation among sites without knowledge or consent of their customers. Traditional policy and enforcement has been confined to single administrative domains: indeed, it is often the case that one domain cannot understand the policies expressed in another domain, much less enforce them. Our work provides a means for functional evaluation of access control decisions irrespective of the provider. Authorization is based on a tag associated with an object, the clouds concerned, and the desired action. This approach opens the door to inter-domain policy expression and enforcement.

Publications

1. Stephen Kirkman and Richard Newman, "InterCloud: A Data Movement Policy DApp for Managing Trust in the Cloud," 5th Annual Conf. on Computational Science and Computational Intelligence (CSCI'18), Dec 13-15, 2018, Las Vegas, NV.

2. Stephen Kirkman and Richard Newman, "A Cloud Data Movement Policy Architecture Based on Smart Contracts and the Ethereum Blockchain", First IEEE Workshop on Blockchain Technologies and Applications (BTA) 2018, Orlando, FL.

3. Stephen Kirkman and Richard Newman, "Using Smart Contracts and Blockchains to Support Consumer Trust Across Distributed Clouds," 13th International Conference on Grid, Cloud, and Cluster Computing (GCC'17: July 17-20, 2017, Las Vegas, USA).

4. Stephen Kirkman and Richard Newman, "Bridging the Cloud Trust Gap: Using ORCON Policy to Manage Consumer Trust Between Different Clouds," 1st IEEE International Conference on Edge Computing (EDGE 2017), June 25 - June 30, 2017, Honolulu, Hawaii, USA.

Contracts and Grants

1. "Cloud-based Machine Learning for Anomaly Detection," **$23,000**, PI, 8/15/17 – 8/14/18, Walt Disney World Company (Dr. Newman part $16,500).

2. "Tokenization of Audit Logs for Cloud-based Processing," **$23,000**, PI, 8/15/16 – 8/14/17, Walt Disney World Company (Dr. Newman part $16,500).

2) Cryptocurrency / Blockchain / Cryptography (UF)

Blockchain technology has provided a practical means to achieve a version of distributed consensus, a problem whose solution remained elusive for decades. However, despite using peer-to-peer architecture, the current implementations are not scalable. Indeed, proof-of-work mining has consumed as much electric power as a modest-sized country! Finding improved, more efficient ways to achieve the same goals, and finding new applications for this emerging technology is a significant element of progress.

Publications

1. Panoat Chuchaisri and Richard Newman, "Fast Response PKC-Based Broadcast Authentication in Wireless Sensor Networks," ACM Mobile Networks and Applications 17:4, pp. 508-525, August 2012.

2. Jyh-haw Yeh, Randy Chow, and Richard Newman, "Key Assignment for Enforcing Access Control Policy Exceptions in Distributed Systems," Information Sciences Journal Vol. 152, pp. 63-88, June 2003. http://www.cise.ufl.edu/ nemo/papers/ISJ2003.pdf

3. Panoat Chuchaisri and Richard Newman "Multi-Resolution Elliptic Curve Digital Signature," Proceedings of IEEE Local Commmunication Networks (LCN 2012), November 2012, Tampa, USA, pp. 93-101.

4. Panoat Chuchaisri and Richard Newman "Fast Response PKC-Based Broadcast Authentication in Wireless Sensor Networks," Proceedings of IEEE CollaborateCom 2010, September 2010, Chicago, USA.

Contracts and Grants

1. "Secure Compartmented Chat," **$33,000**, PI, 8/15/18 – 8/14/19, Raytheon Company (Dr. Newman part $26,500).

2. "Secure Communications for Mobile Devices," **$23,000**, PI, 8/15/15 – 8/14/16, Walt Disney World Company (Dr. Newman part $16,500).

3) HomePlug and IEEE P.1901 Standards (INDEPENDENT and UF)

The typical room in a home in the USA has one cable outlet, perhaps one phone outlet, perhaps one Ethernet connector, but several conveniently located power outlets. Although the wiring used for low voltage power distribution in the home was not designed to support digital communications, and can even be considered to be a hostile communication environment, the confluence of increased computing power, advanced modulation methods, and improved forward error correction has allowed high-speed digital communications between power outlets in the home. My work in this area has focused on efficiency in the medium access and link protocols, and usable security for home installation. I consulted first with Intellon Corporation, which was a leader in CEBus technology (low-speed data transmission for home automation over the home power lines, then with Qualcomm Atheros, before research moved into the area of LAN speed data transmission over home power lines (PowerPacket is the trademarked name).

Publications

1. Srinivas Katar, Manjunath Krishnam, Richard Newman, and Haniph Latchman, "Harnessing the potential of Power Line Communications using HomePlug AV Standard," RF Design Magazine, August 2006.

2. Yu-Ju Lin, Haniph Latchman, Srinivas Katar and Richard Newman, Comparative Performance Study of Wireless and Powerline Networks, IEEE Communications Magazine 41:4, pp. 54-63, April, 2003. http://www.cise.ufl.edu/ nemo/papers/CommMag2003.pdf

3. F. N. Pavlidou, Haniph Latchman, A. J. Han Vinck, and Richard Newman, "Powerline Communications and Applications," International Journal on Communication Systems 16:5, pp. 357-361, May, 2003.

4. Minkyu Lee, Richard Newman, Haniph Latchman, Srinivas Katar, and Larry Yonge, "HomePlug 1.0 Powerline Communication LANs - Protocol Description and Performance Results," International Journal on Communication Systems 16:5, pp. 447-473, 2003. http://www.cise.ufl.edu/ nemo/papers/IJCS2003.pdf

5. Richard E. Newman, Larry Yonge, Sherman Gavette, and Ross Anderson, "HomePlug AV Security Mechanisms," IEEE ISPLC 2007, Pisa, Italy, March 26-28, 2007.

6. Yu-Ju Lin, Richard E. Newman, and Haniph Latchman, "A New TCP and UDP Network Benchmark Suite," 10th ACM Communications and Networking Simulation Symposium (CNS 07), Norfolk, VA, March 25 - 29, 2007.

7. Srinivas Katar, Brent Mashburn, Richard Newman, and Haniph Latchman, "Allocation Requirements for Supporting Latency-Bound Traffic in HomePlug AV Networks," IEEE

GlobeCom, San Francisco, 27 Nov. - 1 Dec. 2006.

8. Richard E. Newman, Larry Yonge, Sherman Gavette, and Ross Anderson, "Protecting Domestic Powerline Communications," in proceedings of Symposium on Usable Privacy and Security (SOUPS 2006), Pittsburgh, PA, July 12-14, 2006, pp. 122-132.

9. Srinivas Katar, Brent Mashburn, Kaywan Afkhamie, Haniph Latchman, and Richard Newman, "Channel Adaptation Based on Cyclo-stationary Noise Characteristics in PLC Systems," in proceedings of IEEE International Symposium on Power Line Communications (ISPLC 2006), Orlando, FL, March 26-29, 2006, pp. 16-21.

10. Srinivas Katar, Manjunath Krishnam, Brent Mashburn, Kaywan Afkhamie, Richard Newman, and Haniph Latchman, "Beacon Schedule Persistence to Mitigate Beacon Loss in HomePlug AV Networks," in proceedings of IEEE International Symposium on PowerLine Communications (ISPLC 2006), Orlando, FL, March 26-29, 2006, pp. 184-188.

11. Hossein Asghari, Richard Newman, and Haniph Latchman, "Bandwidth-efficient Forward-Error-Correction Coding for High Speed Powerline Communications," in proceedings of IEEE International Symposium on Power Line Communications (ISPLC 2006), Orlando, FL, March 26-29, 2006, pp. 350-355.

12. Yu-Ju Lin, Haniph A. Latchman, Jonathan C.L. Liu and Richard Newman, "Periodic Contention-Free Multiple Access For Power Line Communication Networks," IEEE 19th International Conference on Advanced Information Networking and Applications (AINA'05) Volume 2, March 28-30, 2005, Taiwan, pp. 315-318.

13. Srinivas Katar, Richard Newman, Haniph Latchman, and Larry Yonge, "Efficient MAC Framing and ARQ for High-Speed PLC Systems," in proceedings of IEEE International Symposium on Power Line Communications (ISPLC 2005), Vancouver, Canada, April 2005, pp. 27-31.

14. K. H. Afkhamie, S. Katar, L. Yonge, and R. Newman, "An Overview of the upcoming HomePlug AV Standard," proceedings of International Symposium on Powerline Communications (ISPLC 2005), Vancouver, BC, 2005, pp. 400-404.

15. Yu-ju Lin, Haniph Latchman, Jonathan Liu, and Richard Newman, "Periodic Contention-free Multiple Access for Broadband Multimedia Powerline Communication Networks," in proceedings of IEEE International Symposium on Power Line Communications (ISPLC 2005), Vancouver, Cananda, April 2005.

16. Haniph A. Latchman, Kaywan H. Afkhamie, Srinivas Katar, Richard Newman, Brent Mashburn, and Larry Yonge, "High Speed Multimedia Home Networking Over Powerline," National Cable and Telecommunications Association (NCTA) National Show, San Francisco, CA, April 3-5, 2005.

Contracts and Grants

1. "TAMA Protocol Simulation Studies," **$61,000**, Co-PI (PI Latchman), 8/21/99 – 12/31/01, Intellon Corp. (Dr. Newman part $61,000).

4) Distributed Collaboration (UF)

Long before Google docs and hangouts, IRC and SKYPE, my team was developing tools for distributed collaboration. We built a concurrent text editor, object-oriented concurrent graphics editor, shared terminals, voiceover IP, and a management system to support group control of membership and access.

A pet project over the past decade has been UF-DCS (Distributed Conferencing System). Early on as UF faculty, a few graduate students and I devised some groupware applications (Ensemble, an object-oriented concurrent graphics editor, and MACE, a fine-grained, concurrent text editor) and incorporated them into DCS.v.1. With some experience using DCS.v.1, and in my goal of extending the system to handle the problems encountered in WANs, we started DCS.v.2. This effort has focused more on the infrastructure and less on groupware applications per se. In it, we have developed a collection of services we believe are needed to support persistent groups of collaborators over a WAN. These include reliable database services, as our consistency requirements are less than typical databases due to the lack of transactions and the way we manage changes; authentication and secure communications; access control services; conference control services; application management; notification services; and decision support services. The last one is less a necessity and more of a philosophical inclusion in the system, following from the principles of DCS.v.1 that the users of the group should be able to specify how their group worked in terms of actions that affected the group and that a wide range of policies should be supported by the system. In short, the access control services do not permit a requested action to be taken without calling a group-modifiable decision procedure. In many cases, this is just a rubber stamp "YES," but in many cases, it requires a vote of some subset of the group membership, either on-line or off-line. Going from the hardwired but parametrized version of this in v.1 to the more general approach of v.2 has been challenging, and I believe it represents a different paradigm for resource allocation and for access control.

Publications

1. Richard Newman, L. Dyson and O. Sabina, "Authentication and Key Exchange for Mobile Groupware Users," Proceedings of the SPIE Conference on Mathematics of Data/Image Coding, Compression, and Encryption, 3456, San Diego, CA, July 1998.

2. R. E. Newman-Wolfe, M. Webb and M. Montes, "Implicit Locking in the Ensemble Object-Oriented Concurrent Graphics Editor," Proceedings of the ACM Conference on Computer Supported Cooperative Work, CSCW 92 , pp. 265-272, Toronto, Ont., November 1-4, 1992.

3. R. E. Newman-Wolfe, and M. Montes, "Conference Access Control in DCS," Proceedings of GroupWare '92 , pp. 433-437, San Jose, CA, August 3-5, 1992.

4. R. E. Newman-Wolfe and H. Pelimuhandiram, "The MACE Fine-grained Concurrent Text Editor," Proceedings of ACM/IEEE Conference on Organizational Computing Systems, COCS91 , pp. 240-254, Atlanta, November, 1991.

5. R. E. Newman-Wolfe, C. Ramirez, H. Pelimuhandiram, M. Montes, M. Webb and D. L. Wilson, "A Brief Overview of the DCS Distributed Conferencing System," Proceedings of the Summer Usenix Conference , pp. 437-452, Nashville, TN, June 1991.

Contracts and Grants

1. "Secure Compartmented Chat," **$33,000**, PI, 8/15/18 – 8/14/19, Raytheon Company (Dr. Newman part $26,500).

2. "High-Speed Block Synchronization and Forward Error Correction," **$25,000** (PI) 1995-1996, SCTC/NASA/FAU. (Dr. Newman part $25,000)

3. "Virtual SERC: An Experiment in Enterprise Integration," **$31,000**, 1995 – 1996, NSF (Dr. Newman part $31,000).

5) Anonymity / Information Hiding (UF)

For over a decade, I have been investigating various aspects of information hiding. Facets of this area include Traffic Analysis Prevention (TAP), which was my starting point with Ph.D. student Balaji Venktraman. At first, we and other colleagues under a Bell South grant, were studying LAN and WAN traffic, trying to model it using traces from the UF College of Engineering backbone and other points. Soon Balaji and I became interested in new methods of preventing traffic analysis, and eventually culminated in analysis of network covert channels. More recently, I worked with Drs. Ira Moskowitz and Li-Wu Chang of the Naval Research Laboratory on information theoretic aspects of steganography and with Dr. Paul Syverson of NRL on information theoretic aspects of TAP.

Publications

(Book) "Anonymity in the Digital Age – a Theoretical Perspective," sole author, (pending).

1. Balaji R. Venkatraman and R. E. Newman-Wolfe, "Capacity Estimation and Auditability of Network Covert Channels," Proceedings of the IEEE Symposium on Security and Privacy, pp. 186-198, Oakland, CA, May 8-10, 1995.

2. Balaji R. Venkatraman and R. E. Newman-Wolfe, "Performance Analysis of a Method for High Level Prevention of Traffic Analysis Using Measurements from a Campus Network," Proceedings of the IEEE/ACM Tenth Annual Computer Security Applications Conference, pp. 288-297, Orlando, FL, December 5-9, 1994.

3. R. E. Newman-Wolfe, and Balaji R. Venkatraman, "Performance Analysis of a Method for High Level Prevention of Traffic Analysis," Proceedings of the IEEE/ACM Eighth Annual Computer Security Applications Conference , pp. 123-130, San Antonio, TX, November 30-December 4, 1992.

4. R. E. Newman-Wolfe, and B. R. Venkatraman, "High Level Prevention of Traffic Analysis," Proceedings of the Seventh Annual ACM/IEEE Computer Security Applications Conference, pp. 102-109, San Antonio, December 2-6, 1991.

Contracts and Grants

1. "Information Hiding," **$85,000**, PI, 8/10/01 – 5/31/02, NRL vita ITT (Dr. Newman part $85,000).

OTHER RESEARCH PROJECTS (ACADEMIC)

1) Information Security

With Dr. Randy Chow and several graduate students, I have considered problems in providing for secured access between processes in different administrative domains. Some of the issues that arise include policy routing, key distribution, identification and authentication, authorization, policy mapping, connection acceptance and establishment, in addition to the usual issues of cryptographic protection of the communications between the processes. We also investigated the use of Active Networks for discovery and prevention of spoofing and other types of network attacks. One of my first doctoral students, Steve Greenwald, worked with me on the definition of a security model for limited sharing of resources in a multiple AD environment (the DisCom model).

Publications

1. Richard E. Newman, Vipan N. Reddy, and Ira S. Moskowitz, "Anonymity and Covert Channels in Simple Timed Mix-firewalls," in proceedings of WPET 2004, May 2004, Toronto, Canada, pp. 1-16. published in LNCS 3424, D. Martin and A. Serjantov, eds., Springer.

2. Ira S. Moskowitz, Richard E. Newman and Paul F. Syverson, "Quasi-anonymous Channels," in proceedings of CNIS 2003, December 2003, NY, NY, pp. 126-131.

3. Ira S. Moskowitz, Richard E. Newman, Daniel P. Crepeau and Allen R. Miller, "Covert Channels and Anonymizing Networks," proceedings of ACM Workshop on Privacy in Electronic Society (WPES), October 30, 2003, Washington, DC, pp. 79-88.

4. Andrei Serjantov and Richard E. Newman, "On the Anonymity of Timed Pool Mixes," IFIP International Information Security Conference, 2nd Bi-Annual Working Conference on Privacy and Anonymity in Networked and Distributed Systems (I-NetSec03), May 26-28, 2003, Athens, Greece.

5. Richard E. Newman, Ira S. Moskowitz, Paul Syverson and Andrei Serjantov, "Metrics for Traffic Analysis Prevention," Workshop on Privacy Enhancing Technologies, March 26-28, 2003, Dresden, Germany.

6. Oguz Kaan Onbilger, R. Chow and R. Newman, "Remote Digital Signing with Mobile Agents," The Second International Workshop for Asian Public Key Infrastructures (IWAP 2002), October 30-November 01, 2002, Taipei, Taiwan, pp. 123-130.

7. Oguz Kaan Onbilger, R. Newman and R. Chow, "A Distributed and Compromise-tolerant Mobile Agent Protection Scheme," International Conference on Intelligent Agents, Web Technologies and Internet Commerce - IAWTIC2001, July 2001, Las Vegas, pp. 394-400.

8. S. Yeh, R. Chow and R. Newman, "Interdomain Access Control with Policy Routing," Proceedings of the 6th IEEE Workshop on Future Trends in Distributed Computing , pp. 46-52, Tunis,Tunisia, October 1997.

Contracts and Grants

1. "Cloud-based Machine Learning for Anomaly Detection," **$23,000**, PI, 8/15/17 – 8/14/18, Walt Disney World Company (Dr. Newman part $16,500).

2. "Tokenization of Audit Logs for Cloud-based Processing," **$23,000**, PI, 8/15/16 – 8/14/17, Walt Disney World Company (Dr. Newman part $16,500).

3. "IPv6 Automated Device Management," **$23,000**, PI, 8/15/14 – 8/14/15, Walt Disney World Company (Dr. Newman part $16,500).

4. "Interdomain Access Control Using IDPR & Active Network Technology," **$197,400**, Co-PI (PI Chow), 8/21/98 – 8/20/00, NSA. (Dr. Newman part $197,400).

5. "Multilevel Secure Database System in an MLS Network," **$47,000**, PI, 8/16/00 – 8/8/01, Raytheon, Inc. (Dr. Newman part $47,000).

6. "Protection of Naval Computers against Denial-of-Service Attacks," **$60,000**, PI, 1996-1998, ONR/UNISTRY Associates, Inc. (Dr. Newman $45,000).

7. "A Distributed Group Decision Support Tool," **$18,000**, 1995-1996, SERC (Dr. Newman part $18,000)

8. "Interdom Authentication and Authorization for Large Information Systems," with R. Chow, **$50,000**, 1995 – 1996, NSF (Dr. Newman part $50,000).

2) Distributed Systems

I investigated a number of issues in this area from distributed locks and performance, with Dr. Theodore Johnson, to reliable multicast and garbage collection, distributed databases and consistency for groupware systems that is somewhat weaker than the transaction-based consistency typical of distributed databases. With a few graduate students over the years, we have implemented systems for fault-tolerant site servers (sharing the same LAN and network file system) with remote clients (where the largest costs in sending messages between the client and the server site rather than sending them within the server site), and for fault tolerant distributed services (where the servers are in fact site servers and there are high costs for sending messages between sites). The main problem in the latter environment is obtaining useful failure information, and we devised a protocol that uses heartbeats and counter machines to give each host perceived state information about other hosts that could then be used to drive group membership and multicast configuration information. With others, I developed and analyzed a protocol for identification and strong mutual authentication between mobile users and servers when the users do not carry memory with them (other than the usual names and password one could expect).

Publications

1. Jyh-haw Yeh, Randy Chow, and Richard Newman, "Key Assignment for Enforcing Access Control Policy Exceptions in Distributed Systems," Information Sciences Journal Vol. 152, pp. 63-88, June 2003. http://www.cise.ufl.edu/ nemo/papers/ISJ2003.pdf

2. Theodore Johnson and R. E. Newman-Wolfe, "A Comparison of Fast and Low Overhead Distributed Priority Locks," Journal of Parallel and Distributed Computing 32:1, 1996, pp.74-89.

3. W. F. Klostermeyer, R. E. Newman-Wolfe, K. Luo and Y. C. Chow, "DAG Compression for Improving Response after Deadlock Resolution," Congressus Numerantium 81, Dec. 1991, pp. 209-218.

4. C. K Luo, W. Klostermeyer, R. E. Newman-Wolfe and Y. C. Chow, "Optimal Deadlock Resolutions in Edge-disjoint Reducible Wait-for Graphs," Information Processing Letters 38, 28 June 1991, pp. 307-313.

5. Tai-Kuo Woo, Stanley Y. W. Su and Richard Newman-Wolfe, "Resource Allocation in a Partionable Bus Network Using a Graph Coloring Algorithm," IEEE Transactions on Communications 39:12, Dec. 1991, pp. 1794-1801.

6. R. E. Newman-Wolfe, and S. L. Davis, "Sequences, Schedules, and Initialization of Unsynchronized Networks," Congressus Numerantium 76, Dec. 1990, pp. 63-68.

7. Piyush Harsh and Richard E. Newman, "Efficient Distributed Search for Multicast Session Keywords," Proceedings of ICOMP'09, Las Vegas, USA, July 13-16, 2009.

8. Piyush Harsh and Richard E. Newman, "Using Geo-Spatial Session Tagging for Smart Multicast Session Discovery," Proceedings of ACM SIGAPP SAC 2009, Honolulu, Mar. 2009.

9. Piyush Harsh and Richard E. Newman, "mDNS - A Proposal for Hierarchical Multicast Session Directory Architecture", proceedings of ICOMP 2008, Las Vegas, 2008.

10. Piyush Harsh and Richard E. Newman,"An Overlay Solution to IP-Multicast Address Collision Prevention," to appear in IASTED International Conference on Internat and Multimedia Systems and Applications (EuroIMSA 2008), March 17-19, 2008, Innsbruck, Austria.

11. Seung Chul Han, In Kwan Yu, Ye Xia, and Richard E. Newman, "A Node Selection Algorithm for Many-to-many Mapping in Peer-to-peer Networks," IEEE Second International Conference on Internet and Web Applications and Services (ICIW07), May 13-19, 2007, Mauritius.

12. Oguz Kaan Onbilger, R. Newman and R. Chow, "A Distributed and Compromise-tolerant Mobile Agent Protection Scheme," International Conference on Intelligent Agents, Web Technologies and Internet Commerce - IAWTIC2001, July 2001, Las Vegas, pp. 394-400.

13. Tai-Kuo Woo and Richard Newman-Wolfe, "Huffman Trees as a Basis for a Dynamic Mutual Exclusion Algorithm for Distributed Systems," Proceedings of the 12th IEEE International Conference on Distributed Computing Systems , pp. 126-133, Yokohama, Japan, June 9-12, 1992.

14. Soon Lye Lim and Richard E. Newman-Wolfe, "Relationships between Network Parameters and the Performance of Distributed Adaptive Routing Algorithms Using Learning Automata in Packet-Switched Datagram Networks," Proceedings of IEEE Conference on Knowledge-Based Systems, SPIE OE/Aerospace Sensing Symposium , pp. 117-125, Orlando, April 20-24, 1992.

15. K. C. Luo, W. Klostermeyer, Y. C. Chow and R. E. Newman-Wolfe, "An Optimal Distributed Algorithm for Failure-Driven Leader Election in Bounded-Degree Networks," Proceedings of the 3rd IEEE Workshop on Future Trends in Distributed Processing, pp. 136-141, Taipei, Taiwan, April 1992.

16. K. C. Luo, Y. C. Chow and R. E. Newman-Wolfe, "Near-optimal Heuristics for Scheduling on Task-dependent Machines," Proceedings of the Second IEEE Symposium on Parallel and Distributed Processing, pp. 842-847, December 1990.

17. K. C. Luo, Y. C. Chow and R. E. Newman-Wolfe, "An Efficient Broadcast Protocol in Networks with Changing Topologies," Proceedings of the Second IEEE Workshop on Future Trends in Distributed Computing Systems, pp. 88-93, September 1990.

18. K. C. Luo, Y. C. Chow and R. E. Newman-Wolfe, "An Efficient Algorithm for Re-configuration of Large-Scale Point-to-Point Satellite Computer Networks with Maximum Connectivity," Proceedings of the Ninth Annual International Phoenix Conference on Computers and Communication, pp. 194-201, March 1990.

19. R. E. Newman-Wolfe, "A Protocol for Wait-Free Atomic Multi-Reader Shared Variables," Proceedings of the 1987 ACM Symposium on the Principles of Distributed Computing, pp. 232-247, Vancouver, BC, Canada, August 1987.

Contracts and Grants

1. "Web Application for Risk Management," **$23,000**, PI, 8/15/14 – 8/14/15, Walt Disney World Company (Dr. Newman part $16,500).

2. "Design and Implementation of Robust Micro-controller for Real-time Systems," **$1,181,000**, Co-PI, (PI Lee) 3/4/98 – 3/3/01, US Army (Dr. Newman part $1,181,000).

3. "Multilevel Secure Database System in an MLS Network," **$47,000**, PI, 8/16/00 – 8/8/01, Raytheon, Inc. (Dr. Newman part $47,000).

3) LAN Security

Several projects with Raytheon Systems Company have focused on securing LANs in various ways. Our first projects considered wireless LANs (the RayLink product was their business motivation), and I supervised an undergraduate team that used the Layered Service Provider (LSP) available for WinSock2 to introduce PCMCIA hardware-based cryptographic mechanisms (Fortezza cards with X.509 certificates and Fortezza encryption) for establishing private communications first between a pair of laptops, then between laptops and a wired network through an access point and a guard. In order to minimize the impact on off-the-shelf applications, we had to provide for some external initialization of the smart card as well as key distribution, etc. A particularly sticky point was handling communications between hosts without Fortezza hardware on the wired LAN and laptops on the WLAN through the guard without disrupting communication connections. The two more recent projects with them have centered around developing a system for database-driven network vulnerability assessment, and currently, enforcement of multilevel secure (MLS policies in a multiple single level (MSL) environment, using a COTS DBMS and PKIX.

1. Richard E. Newman, "Key Distribution for a MLS Network Architecture," Proceedings of the SPIE Conference on Mathematics of Data/Image Coding, Compression, and Encryption III, San Diego, CA, July 2000, pp. 29-43.

2. Richard E. Newman, B. Bouldin, P. Broccard, T. Coscenza, S. Farago, M. Hoyt, K. Nolan, M. Sanders, T. Swanson and J. Winner, "Use of LSP in Securing Wireless LAN Communications," Proceedings of the SPIE Conference on Mathematics of Data/Image Coding, Compression, and Encryption III, San Diego, CA, July 2000, pp. 44-55.

3. Richard E. Newman, M. V. Hoyt, T. Swanson, P. Broccard, M. Sanders and J. Winner, "Design of LAN-Lock, A System for Securing Wireless Networks," Proceedings of the Fifteenth Annual Computer Security Applications Conference, pp. 170-177, Phoenix, AZ, Dec. 6-10, 1999.

4. O. Eksioglu, R. Newman and R. Chow, "The Design and Implementation of Packet-Level Access Control Security Scheme (PASS)," Proceedings of the International Symposium on Internet Technology , pp. 266-271, Taipei, Taiwan, April 1998.

Contracts and Grants

1. "Secure Communications for Mobile Devices," **$23,000**, PI, 8/15/15 – 8/14/16, Walt Disney World Company (Dr. Newman part $16,500).

2. "IPv6 Automated Device Management," **$23,000**, PI, 8/15/14 – 8/14/15, Walt Disney World Company (Dr. Newman part $16,500).

3. "Integrated Process and Product Development," **$63,000**, PI, 8/16/97 – 8/8/01, Raytheon, Inc., (Dr. Newman part $63,000).

4) Intrusion Detection Systems

I have worked in the area of detection of denial-of-service (DoS) attacks as well as system resource availability monitoring for several years now. Along with UNISTRY Associates, Inc., we developed architecture for detection, coordination, and response to resource outages perceived or incipient. This system has layered defense to detect both misuse and anomalies in the network event stream and in the system event stream. It also monitors resource availability to catch non-malicious loss as well as otherwise undetected attacks. Coordinators may create static or dynamic detectors and monitors, and may execute responses in real time. A single configuration file formed as a rule base, depending on an extended event set and conditions, enunciates policy. Complex detection (e.g. temporal correlation) is carried out by a net of intermediate detectors. The system is extensible and distributed.

Contracts and Grants

1. "Integrated Process and Product Development," **$63,000**, PI, 8/16/97 – 8/8/01, Raytheon, Inc., (Dr. Newman part $63,000).

2. "Protection of Naval Computers against Denial-of-Service Attacks," **$60,000**, PI, 1996-1998, ONR/UNISTRY Associates, Inc. (Dr. Newman $45,000).

5) Satellite Communications

Several years ago, Dr. Randy Chow and I worked over an extended period of time on a host of problems associated with directional point-to-point links in a somewhat predictable dynamic environment (satellites with laser crosslinks). Some of our aims in the system were to develop robust topology selection and routing algorithms. The laser transceivers could be redirected to form a changing topology, but both ends would have to point at each other long enough to acquire each other in order to establish the link. This poses particularly interesting problems when the network is partitioned, which I solved in both theoretical and practical ways. With two master's students, we designed, verified, and implemented successfully the node control software used with experimental, high-speed laser links built by ThermoTrax in San Diego, CA. We delivered the system to Rome labs. In addition to the wide range of interesting problems we encountered and solved in that project, I also worked as the Associate Director of the NASA Center for Space Communication Technology. The main focus of the SCTC was on high quality video compression and transmission over Ka band satellite links. I led a team at UF that performed some measurements on Ka band links using the ACTS satellite. We did some modeling of the error arrival process to establish its qualities of "burstiness" or not. We also devised efficient forward error correction (FEC) techniques combined with block synchronization that could withstand very long burst errors.

1. Richard E. Newman, R. Chow and J. Lin, "Efficient Link Access Protocols for High Delay Shared Laser Links," Proceedings of the SOQUE International Symposium on Lasers , New Orleans, LA, December 1997.

2. Krishna Harathi, Padmashree Krishna, Richard E. Newman-Wolfe and Randy Y. C. Chow, "A Fast Link Assignment Algorithm for Satellite Communication Networks," Proceedings of the Twelfth Annual International Phoenix Conference on Computers and Communication, pp. 401-408, Phoenix, AZ, March 23-26, 1993.

3. K. C. Luo, Y. C. Chow and R. E. Newman-Wolfe, "An Efficient Broadcast Protocol in Networks with Changing Topologies," Proceedings of the Second IEEE Workshop on Future Trends in Distributed Computing Systems, pp. 88-93, September 1990.

4. K. C. Luo, Y. C. Chow and R. E. Newman-Wolfe, "An Efficient Algorithm for Reconfiguration of Large-Scale Point-to-Point Satellite Computer Networks with Maximum Connectivity," Proceedings of the Ninth Annual International Phoenix Conference on Computers and Communication, pp. 194-201, March 1990.

5. C. McLochlin, C. Ward, Y. C. Chow, R. E. Newman-Wolfe, J. N. Wilson, and T. B. Hughes, "Optimizing the Delay and Reliability of Low Altitude Satellite Network Topologies," Proceedings of the IEEE Military Communications Conference, MILCOM87, pp. 417-422, Washington, D.C., October 19-22, 1987.

6. C. McLochlin, C. Ward, Y. C. Chow, R. E. Newman-Wolfe, J. N. Wilson and T. B. Hughes, "Determining the Delay and Reliability of Low Altitude Satellite Network Topologies Using Simulation," Proceedings of ACM SIGSIM and IEEE Computer Society Symposium on the Simulation of Computer Networks, pp. 28-35, Colorado Springs, CO, August 1-4, 1987.

Contracts and Grants

1. "Enforcing Inter-Domain Access Control with IPv6," **$100,000**, (co-PI, Chow PI), 1996 – 1998, NSA. (Dr. Newman part $100,000)

2. "Interdom Authentication and Authorization for Large Information Systems," with R. Chow, **$50,000**, 1995 – 1996, NSF (Dr. Newman part $50,000).

3. "Computer and Communication Network Security," with R. Chow, **$422,000**, 1994 - 1997, U.S. Army (Dr. Newman part $422,000).

GRANT AND CONTRACTS (TOTAL $7,551,400 / Dr. Newman Part $3,614,400)

1. "Secure Compartmented Chat," **$33,000**, PI, 8/15/18 – 8/14/19, Raytheon Company (Dr. Newman part $26,500).

2. "Cloud-based Machine Learning for Anomaly Detection," **$23,000**, PI, 8/15/17 – 8/14/18, Walt Disney World Company (Dr. Newman part $16,500).

3. "Tokenization of Audit Logs for Cloud-based Processing," **$23,000**, PI, 8/15/16 – 8/14/17, Walt Disney World Company (Dr. Newman part $16,500).

4. "Secure Communications for Mobile Devices," **$23,000**, PI, 8/15/15 – 8/14/16, Walt Disney World Company (Dr. Newman part $16,500).

5. "Web Application for Risk Management," **$23,000**, PI, 8/15/14 – 8/14/15, Walt Disney World Company (Dr. Newman part $16,500).

6. "IPv6 Automated Device Management," **$23,000**, PI, 8/15/14 – 8/14/15, Walt Disney World Company (Dr. Newman part $16,500).

7. "Information Hiding," **$85,000**, PI, 8/10/01 – 5/31/02, NRL vita ITT (Dr. Newman part $85,000).

8. "Interdomain Access Control Using IDPR & Active Network Technology," **$197,400**, Co-PI (PI Chow), 8/21/98 – 8/20/00, NSA. (Dr. Newman part $197,400).

9. "Design and Implementation of Robust Micro-controller for Real-time Systems," **$1,181,000**, Co-PI, (PI Lee) 3/4/98 – 3/3/01, US Army (Dr. Newman part $1,181,000).

10. "TAMA Protocol Simulation Studies," **$61,000**, Co-PI (PI Latchman), 8/21/99 – 12/31/01, Intellon Corp. (Dr. Newman part $61,000).

11. "Multilevel Secure Database System in an MLS Network," **$47,000**, PI, 8/16/00 – 8/8/01, Raytheon, Inc. (Dr. Newman part $47,000).

12. "Integrated Process and Product Development," **$63,000**, PI, 8/16/97 – 8/8/01, Raytheon, Inc., (Dr. Newman part $63,000).

13. "Protection of Naval Computers against Denial-of-Service Attacks," **$60,000**, PI, 1996-1998, ONR/UNISTRY Associates, Inc. (Dr. Newman $45,000).

14. "Integrated Process and Product Development," **$63,000**, PI, 8/16/97 – 8/08/01, Raytheon, Inc., "Protection of Naval Computers Against Denial-of-Service Attacks," $60,000, PI, 1996-1998, ONR/UNISTRY Associates, Inc. (Dr. Newman part $60,000)

15. "Enforcing Inter-Domain Access Control with IPv6," **$100,000**, (co-PI, Chow PI), 1996 – 1998, NSA. (Dr. Newman part $100,000)

16. "High-Speed Block Synchronization and Forward Error Correction," **$25,000** (PI) 1995-1996, SCTC/NASA/FAU. (Dr. Newman part $25,000)

17. "Virtual SERC: An Experiment in Enterprise Integration," **$31,000**, 1995 – 1996, NSF (Dr. Newman part $31,000).

18. "A Distributed Group Decision Support Tool," **$18,000**, 1995-1996, SERC (Dr. Newman part $18,000)

19. "Interdom Authentication and Authorization for Large Information Systems," with R. Chow, **$50,000**, 1995 – 1996, NSF (Dr. Newman part $50,000).

20. "Computer and Communication Network Security," with R. Chow, **$422,000**, 1994 - 1997, U.S. Army (Dr. Newman part $422,000).

21. "Space Communication Technology Center: Digital Signal Handling and Satellite Networking," (PI of UF portion of **$5,000,000** NASA Center for Commercial Development of Space, with co-PIs S. Miller, H. Latchman, R. Chow, R. Shrestha), $1,102,000, 1991 – 1997 NASA (DR. Newman part $1,102,000).

PUBLICATIONS (TOTAL)

Book

Author, "Anonymity in the Digital Age – a Theoretical Perspective," (pending)

Journal Publications

1. Panoat Chuchaisri and Richard Newman, "Fast Response PKC-Based Broadcast Authentication in Wireless Sensor Networks," ACM Mobile Networks and Applications 17:4, pp. 508-525, August 2012.

2. InKwan Yu and Richard Newman, "TCP slow start with fair share of bandwidth", Computer Networks 55:17, pp. 3932-3946, 1 Dec. 2011.

3. Srinivas Katar, Manjunath Krishnam, Richard Newman, and Haniph Latchman, "Harnessing the potential of Power Line Communications using HomePlug AV Standard," RF Design Magazine, August 2006.

4. Yu-Ju Lin, Haniph Latchman, Srinivas Katar and Richard Newman, Comparative Performance Study of Wireless and Powerline Networks, IEEE Communications Magazine 41:4, pp. 54-63, April, 2003.http://www.cise.ufl.edu/ nemo/papers/CommMag2003.pdf

5. F. N. Pavlidou, Haniph Latchman, A. J. Han Vinck, and Richard Newman, "Powerline Communications and Applications," International Journal on Communication Systems 16:5, pp. 357-361, May, 2003.

6. Minkyu Lee, Richard Newman, Haniph Latchman, Srinivas Katar, and Larry Yonge, "HomePlug 1.0 Powerline Communication LANs - Protocol Description and Performance Results," International Journal on Communication Systems 16:5, pp. 447-473, 2003. http://www.cise.ufl.edu/ nemo/papers/IJCS2003.pdf

7. Jyh-haw Yeh, Randy Chow, and Richard Newman, "Key Assignment for Enforcing Access Control Policy Exceptions in Distributed Systems," Information Sciences Journal Vol. 152, pp. 63-88, June 2003. http://www.cise.ufl.edu/ nemo/papers/ISJ2003.pdf

8. Theodore Johnson and R. E. Newman-Wolfe, "A Comparison of Fast and Low Overhead Distributed Priority Locks," Journal of Parallel and Distributed Computing 32:1, 1996, pp. 74-89.

9. W. F. Klostermeyer, R. E. Newman-Wolfe, K. Luo and Y. C. Chow, "DAG Compression for Improving Response after Deadlock Resolution," Congressus Numerantium 81, Dec. 1991, pp.

209-218.

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11. Tai-Kuo Woo, Stanley Y. W. Su and Richard Newman-Wolfe, "Resource Allocation in a Partionable Bus Network Using a Graph Coloring Algorithm," IEEE Transactions on Communications 39:12, Dec. 1991, pp. 1794-1801.

12. R. E. Newman-Wolfe, and S. L. Davis, "Sequences, Schedules, and Initialization of Unsynchronized Networks," Congressus Numerantium 76, Dec. 1990, pp. 63-68.

13. Manuel E. Bermudez, R. E. Newman-Wolfe and G. Logothetis, "Parallel Construction of SLR(1) and LALR(1) Parsers," International Journal of Parallel Programming v. 19, no. 3, June 1990, pp. 163-184.

14. R. Paturi, Joel I. Seiferas, J. Simon and R. E. Newman-Wolfe, "Milking the Aanderaa Argument," Information and Computation , vol. 88, no. 1, pp. 88-104, Sept. 1990.

15. R. E. Newman-Wolfe, R. Dutton and R. Brigham, "Connecting Sets in Graphs – A Domination Related Concept," Congressus Numerantium, vol. 67, pp. 67-76, 1988.

16. R. E. Newman-Wolfe, "Bounds for the Towers of Hanoi Problem with Multiple Work Pegs," accepted for publication by The Computer Journal.

Refereed Conference Publications

1. Stephen Kirkman and Richard Newman, "InterCloud: A Data Movement Policy DApp for Managing Trust in the Cloud," 5th Annual Conf. on Computational Science and Computational Intelligence (CSCI'18), Dec 13-15, 2018, Las Vegas, NV.

2. Stephen Kirkman and Richard Newman, "A Cloud Data Movement Policy Architecture Based on Smart Contracts and the Ethereum Blockchain", First IEEE Workshop on Blockchain Technologies and Applications (BTA) 2018, Orlando, FL.

3. Stephen Kirkman and Richard Newman, "Using Smart Contracts and Blockchains to Support Consumer Trust Across Distributed Clouds," 13th International Conference on Grid, Cloud, and Cluster Computing (GCC'17: July 17-20, 2017, Las Vegas, USA).

4. Stephen Kirkman and Richard Newman, "Bridging the Cloud Trust Gap: Using ORCON Policy to Manage Consumer Trust Between Different Clouds," 1st IEEE International Conference on Edge Computing (EDGE 2017), June 25 - June 30, 2017, Honolulu, Hawaii, USA.

5. Panoat Chuchaisri and Richard Newman "Multi-Resolution Elliptic Curve Digital Signature," Proceedings of IEEE Local Commmunication Networks (LCN 2012), November 2012, Tampa, USA, pp. 93-101.

6. Panoat Chuchaisri and Richard Newman "Fast Response PKC-Based Broadcast Authentication in Wireless Sensor Networks," Proceedings of IEEE CollaborateCom 2010, September 2010, Chicago, USA.

7. Mahendra Kumar and Richard Newman, "J3: High Payload Histogram Neutral JPEG Steganography," Proceedings of Eighth International Conference on Privacy, Security and Trust (PST2010), August, 2010, Ottowa, CA.

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