

Dr. Robert F. Erbacher, Sc.D.
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 Silver Spring, MD 20904

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Citizenship: USA
Security Clearance: Secret

Curriculum Vitae

Research Interests: cyber analytics, network security, usable security, digital forensics, situational awareness, computer security, information assurance, intrusion detection, visualization, cyber-terrorism, and cyber command and control.

Professional Preparation:

- University of Massachusetts at Lowell, Computer Science Department, Lowell, MA
- Doctor of Science in Computer Science. Conferred June '98 9/93-6/98
 Dissertation: *Visual Assistance for Concurrent Processing*
 Advisor: Dr. Georges G. Grinstein, Ph.D.
 - Master of Science in Computer Science 9/91-6/93
- University of Lowell, Computer Science Department, Lowell, MA
- Bachelor of Science in Computer Science. Minor in Mathematics 9/88-6/91

Professional Experience:

- ITC-Brazil
- Associate Director 4/16-Present
 Joint Position with ARO
- Army Research Office
- Program Manager (DB IV) 4/16-Present
 S&T Outreach Program Manager to South America on Advanced Computing
 RFEC Americas Engagement and Outreach (South America) on Advanced Computing
 Army Liaison on Research to Brazil
- Army Research Laboratory
- Computer Scientist (DB IV) 10/13-4/16
 Review of the Chilean Cybersecurity Research Program 10/2015
 COR, AR&EP Contract (Cyber CRA Industrial Partner), cap of \$48.5M 08/14-12/15
 COR, Phase II SBIR, "Novel Detection Mechanisms for Advanced Persistent Threat," \$1M 2/14-12/15
 Project Lead, Cognitive Foundations of Cyber Analysis 10/14-09/15
 Project Lead, Tactical Cyber Defense 06/14-09/14
 Task Lead, Cognitive Foundations of Cyber Analysts, ARL Internal Mission Funds 10/13-09/14
 COR, Phase I SBIR, "Novel Detection Mechanisms for Advanced Persistent Threat" 09/12-12/13
 - Computer Scientist (DB III) 5/11-9/13
 Cooperative Agreement Manager: Science of Cyber Security Cooperative Agreement 9/11-3/14
 Project Lead, Advanced Intrusion Detection, ARL Internal Mission Funds 10/12-09/13
 Technical Lead, Adversarial Dynamics, ARL Internal Directorate Funds (DSI) 10/11-09/13
 Final Report, Final Presentation 04/2014
 Project Lead, Science of Intrusion Detection, ARL Internal Mission Funds 10/11-09/12
 - Security clearance granted: Secret 8/11-Present
 - Acting Branch Chief (Tactical Network Assurance Branch) 5/13-10/13
- Northwest Security Institute (NWSI)
- Senior Principal Scientist 7/10-5/11
- Utah State University - Logan, UT
 Computer Science Department
- Assistant Professor 8/03-6/10
- University at Albany - SUNY, Albany, NY

Computer Science Department	
• Assistant Professor	9/99-7/03
University of Idaho, Moscow, ID	
Computer Science Department	
• Visiting Assistant Professor	8/98-7/99
University of Massachusetts at Lowell, Lowell, MA	
Institute for Visualization and Perception Research	
• Research Assistant	9/90-8/98
University of Massachusetts at Lowell, Lowell, MA	
Continuing Studies and Corporate Education	
• Adjunct Faculty	1/96-5/98
SpaceTec IMC Corporation, Lowell, MA	
• Software Engineer	6/97-9/97
The MITRE Corporation, Bedford, MA	
• Software Engineer	5/94-5/97
University of Massachusetts at Lowell, Lowell, MA	
Computer Science Department	
• Teaching Assistant	9/91-5/93

Honors and Awards:

• Best Paper Award , “Ontology-based Adaptive Systems of Cyber Defense,” 2015 Semantic Technology for Intelligence, Defense, and Security (STIDS), Fairfax, VA.	11/15
• Department of the Army, Certification of Achievement	4/15
• Best Paper Award , “Cognitive Task Analysis of Network Analysts and Managers for Network Situational Awareness,” SPIE ‘2010 Conference on Visualization and Data Analysis, Santa Clara, CA.	1/10
• Long Service Award, IS&T/SPIE Conference on Visualization and Data Analysis	1/08
• Best Paper Award , “Identification and Localization of Data Types within Large-Scale File Systems,” Workshop on Systematic Approaches to Digital Forensic Engineering, Seattle, WA	4/07
• Best Paper Award Nomination, “Foundations of Visual Forensic Analysis,” Information Assurance Workshop, West Point, NY.	6/06
• AFRL Summer Faculty Fellowship Program, externally reviewed by ASEE (External , \$21,806), 80% rejection rate	5/06-7/06
• Best Paper Award Nomination, “A Visualization Paradigm for Network Intrusion Detection,” Information Assurance Workshop, West Point, NY.	6/05
• AFRL Summer Faculty Fellowship Program, externally reviewed by ASEE (External , \$21,806), 80% rejection rate, A+ rating. Highest rated project at AFRL-Rome Labs.	5/05-7/05
• 2004 AFRL Visiting Faculty Research Program Extension Grant (External , \$10,000)	8/04-12/04
• AFRL Visiting Faculty Research Program (External , \$21,806)	5/04-7/04
• Outstanding Contributions Award as Applications Co-Chair, IEEE Visualization	10/03
• 2001 International Multi-Conference Achievement Award	6/01
• Award for outstanding contributions to Computer Graphics by an Undergraduate	5/91
• Award for outstanding service and research to the Computer Science Department by an Undergraduate	5/91

Funding (Dr. Erbacher as PI):

• Awarded CISD directorate competitive research funding	FY16
• Continuation Funding: Novel integration Strategies for Google Maps, Funded by IntelliVis (External , \$3,300)	1/09-4/09
• Darpa Seed Grant: Network Visualization Seedling, Funded by Darpa through IntelliVis (External , \$50,000)	5/08-3/09
• Exchange Transport Agent, Funded by Xapio (External , \$1633);	11/08-12/108
• Continuation Funding: Extending VisAlert with automated topology generation and java appletization, Funded by IntelliVis (External , \$5,000)	8/08-12/08
• Develop a java based interactive infostrip visualization, Funded by Medivis through IntelliVis	4/08-6/08

- (**External**, \$4,000)
- Continuation Funding: Extending VisAlert with java appletization, Funded by IntelliVis (**External**, \$5,000) 1/08-5/08
- Continuation Funding: Novel Interface Development for XAPIO, Funded by Xapio (**External**, \$7529) 9/07-12/07
- Visual Situational Awareness for Vulnerability and Impact Assessment, Funded by AFRL-Rome Labs (**External, Solo PI**, \$144,500) 5/07-4/08
- Novel Interface Development for XAPIO, Funded by Xapio (**External**, \$15,000) 5/07-9/07
- Extending VisAlert with Novel GUI and Database Functionality, Funded by IntelliVis (**External**, \$12,500) 1/07-5/07
- A Java Implementation of VisAlert, Funded by IntelliVis (**External**, \$12,500) 9/06-12/06
- A Laboratory for Security, Distributed Systems, and Data Mining, PI: Supratik Mukhopadhyay, CoPIs: Stephen Clyde, Robert Erbacher, SeungJin Lim, Chad Mano. Innovation Fund Grant. (Internal, \$50,000) 12/06
- Student programming for support of research and development of the VisAware project, Funded by DARPA through IntelliVis (**External**, \$12,500) 1/06-6/06
- 2005 AFRL Visiting Faculty Fellowship Program Extension Grant funded Through SUNYIT (**External**, \$10,000) 9/05-12/05
- Statistical Methods for Computational Biology. PI: Adele Cutler (Internal, \$30,000) 7/04-6/05
- New Faculty Research Grant (Internal, \$15,000) 5/04-4/05
- Acquired donation of an NVIDIA FX3000 graphics board from NVIDIA (**External**, MSRP: \$2,500) 9/03
- “The Information Security Academy: A Partnership Model for Building Public Sector Capacity”, funded by Dept. of Education (FIPSE), PI: Bloniarz; Investigators: Bangert-Drowns, Berg, Erbacher, Gangolly, Girona, Goel; Partners: Hurbanek (NY State Police), Iwan (NY State Office of Technology). (**External**, \$490K) 9/02-8/05
- “High Performance Network Connections for Science and Engineering Research - HPNC: University at Albany-SUNY Connection to vBNS and Abilene via NYSERNet,” funded by NSF, PI’s: Delia, Lance; Investigators: Bloniarz, Bosart, Chang, Dawes, Erbacher, Keyser, Knight, Molinari, Mullin, Wang. (**External**, \$150K) 9/01-8/03
- Acquired donation of two used high end SGI workstations from RayTech Systems of Latham, NY (**External**) 1/03
- Category A Faculty Research Award Program 2000 — 2001 Award, funded by University at Albany-SUNY. (Internal, \$7,500) 5/00

Travel Grants:

- Waived Registration Fee, VizSec 2011, Pittsburgh, PA. (**External**, \$300) 07/11
- Travel Grant to attend the Digital Forensics Research Workshop at PNNL, funded by PNNL (**External**, \$1,500) 09/09
- Travel Grant to Present an invited talk at the ARO Workshop on Digital Forensics, funded by Strategic Analysis (**External**, \$1200) 09/09
- Travel Grant to attend PNNL’s VAC Consortium Meeting, funded by PNNL (**External**, \$1,000) 08/09
- Travel Grant to Present Two Invited Talks at PNNL and attend UW-PNNL Cyber Analytics Workshop, funded by PNNL (**External**, \$2,200) 9/08
- Travel Grant to Attend the Second DOE Open Workshop on Cyber-Security Research and Development 2008, Funded by Darpa through Intellivis (**External**, \$1,444). 6/08
- Travel Grant to Attend IEEE Security and Privacy Symposium 2008, Funded by Darpa through Intellivis (**External**, \$2,276). 5/08
- Travel Grant to Attend the COI Workshop on Security in Large-Scale Computing. Funded by PNNL (**External**, \$2,000) 8/05
- Travel Grant to Attend the ARDA IA Workshop, Funded by University of Utah. (**External**, \$1,500) 6/04
- Travel Grant to Attend IEEE Visualization 2002, Funded by University at Albany-SUNY. (Internal, \$800) 12/02
- Travel Grant to attend the 2002 Computer Forensics Workshop, funded by University of Idaho. (**External**, \$1,000) 9/02

Licenses and Invention Notification Forms:

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| • Software License for “AdviseAid” to Intellivis | 6/08-Present |
| • “Generalized visualization design for immediate situational awareness assessment with applications to impact of cyber events,” invention notification. | 10/2008 |
| • “Trilogy: Detailed situational awareness visualization technique for the integration of ground truth data, impact assessment data, and network topologies,” invention notification. | 10/2008 |

Consulting (Technology Transfer and Commercialization):

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| • Intellivis - Advising the development of visualization techniques for situational awareness. | 2005-2011 |
| • Xapio - Advising the integration of DRM capabilities into a novel document management and distribution system. | 2006-2011 |

Professional Memberships:

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| • IEEE Communications Society Technical Committee on Communications and Information Security | 2013-Present |
| • IEEE Communications Society | 2013-Present |
| • IEEE Systems, Man, and Cybernetics Society Membership | 2013-Present |
| • Association for Computing Machinery (ACM) | 1994-Present |
| • IEEE and the IEEE Computer Society | 1994-Present |
| • IEEE Computer Society Technical Committee on Visualization and Graphics (TCVG) | 1999-Present |
| • ACM SIGKDD (Special Interest Group on Knowledge Discovery and Data Mining) | 1999-Present |
| • IEEE Computer Society Technical Committee on Security and Privacy | 2002-Present |
| • ACM SIGGRAPH (Special Interest Group on Computer Graphics) | 1994-2006 |
| • IASTED | 2001-2004 |
| • IASTED Technical Committee on “Computer Vision” | 2001-2004 |
| • Member, University at Albany-SUNY’s Center for Comparative Functional Genomics | 2000-2003 |
| • ACM SIGARCH (Special Interest Group on Computer Architecture) | 1996-2003 |

Publications (graduate students, undergraduate students):

Journal Publications:

- Robert F. Erbacher and Steve Hutchinson, “Case-Based Reasoning Extensions for Network Alert Reporting,” *International Journal of Advancements in Computing Technology (IJACT)*, Vol. 8, No. 2, March 2016, pp. 88-107.
- Zhijiang Chen, Linqiang Ge, Guobin Xu, Wei Yu, Robert F. Erbacher, Hasan Cam, and Nnanna Ekedebe, “A threat monitoring system in enterprise networks with smart mobiles,” *Int. J. Security and Networks*, Vol. 11, Nos. 1/2, 2016, pp.66–81.
- Robert F. Erbacher, Rian Shelley, Steen Monteiro, “GULv3—A Novel Tool for Network Managers to Audit Networks,” *ISCA International Journal of Computers and Their Applications (IJCA)*, Vol. 19, No. 1, March 2012, pp. 26-39.
- Robert F. Erbacher, Anupama Biswas, Trent Cameron, “Novel Data Reduction Techniques in Large-Scale Network Infrastructures through Impact and Vulnerability Assessment,” *International Journal of Advancements in Computing Technology (IJACT)*, Vol. 4, No. 1, March 2012, pp. 32-48.
- Robert F. Erbacher, Deborah A. Frincke, Sarah J. Moody, Glenn Fink, “A Multi-Phase Network Situational Awareness Cognitive Task Analysis,” *Information Visualization Journal*, Vol. 9, No. 3, September 2010, pp. 204-219.
- Robert F. Erbacher and Karen A. Forcht, “Combining Visualization and Interaction for Scalable Detection of Anomalies in Network Data,” *Journal of Computer Information Systems*, Vol. 50, No. 4, Summer 2010, pp. 117-126.
- Steen Monteiro and Robert F. Erbacher, “An Authentication and Validation Mechanism for Analyzing Syslogs Forensically,” *ACM SIGOPS Operating Systems Review*, Vol. 42, No. 3, 2008, pp. 41-50.
- Richard Swart and Robert F. Erbacher, “Educating Students to Create Trustworthy Computer and Information Systems,” *IEEE Security & Privacy*, Vol. 5, No. 3, May/June 2007, pp. 58-61.
- Stefano Foresti, James Agutter, Yarden Livnat, Robert Erbacher, and Shaun Moon, “Visual Correlation of Network Alerts,” *Computer Graphics and Applications*, Vol. 26, No. 2, March/April 2006, pp. 48-59.
- Sheldon Teerlink and Robert F. Erbacher, “Improving the Computer Forensic Analysis Process through Visualization,” *Communications of the ACM*, Vol. 49, No. 2, 2006, pp. 71-75.
- Alec Yasinsac, Robert Erbacher, Donald G. Marks, Mark M. Pollitt, and Peter Sommer, “Computer Forensics Education,” *IEEE Security and Privacy*, Vol. 1, No. 4, 2003, pp. 15-23.
- Matthew J. Pastizzo, Robert F. Erbacher, and Laurie B. Feldman, “Multi-Dimensional Data Visualization,” *Behavior Research Methods, Instruments, and Computers*, Vol. 34, No. 2, 2002, pp. 158-162.
- Robert F. Erbacher, Kenneth L. Walker, and Deborah A. Frincke, “Intrusion and Misuse Detection in Large-Scale Systems,” *Computer Graphics and Applications*, Vol. 22, No. 1, January/February 2002, pp. 38-48.
- Robert F. Erbacher and Alex Pang, “Special Section on Visualization and Data Analysis,” *Guest Editorial: Journal of Electronic Imaging*, Vol. 9, No. 4, October 2000, pp. 354-355.
- Robert F. Erbacher and Georges G. Grinstein, “Visual Data Exploration and Analysis II,” *Editorial: IEEE Computational Science & Engineering*, Summer 1995, pp. 85.
- Robert F. Erbacher, Georges G. Grinstein, John Peter Lee, Haim Levkowitz, Lisa Masterman, Ron Pickett, and Stuart Smith, “Exploratory Visualization Research at the University of Massachusetts at Lowell,” *Computers & Graphics*, Vol. 19, No. 1, 1995, pp. 131-139.

Book Chapters:

- Sabrina De Capitani di Vinnercati, Robert F. Erbacher, Sara Foresti, Sushil Jajodia, Giovanni Livraga, and Pierangela Samarati, “Encryption and fragmentation for data confidentiality in the cloud,” *Springer Foundations of Security Analysis and Design VII*, December 2014, pp. 212-243.
- John Yen, Robert Erbacher, Cheng Zhong, and Peng Liu, “Cognitive Process,” *Springer Cyber Defense and Situational Awareness*, December 2014, pp. 119-144.
- Massimiliano Albanese, Robert Erbacher, Sushil Jajodia, Cristian Molinaro, Fabio Persia, Antonio Picariello, Giancarlo Sperl'i, and V. S. Subrahmanian, “Recognizing Unexplained Behavior in Network Intrusions,” *Springer Network Science and Cybersecurity: Advances in Information Security*, January 2014, pp. 39-62.
- Alexander Kott, Cliff Wang, Robert F. Erbacher, “Preview,” *Cyber Defense and Situational Awareness*, Springer 2014, pp. 1-5.
- Alexander Kott, Cliff Wang, Robert F. Erbacher, “Concluding Thoughts,” *Cyber Defense and Situational*

Awareness, Springer 2014, pp. 323-328.

Refereed Full Conference and Workshop Papers (Presenter Noted with *):

- Chen Zhong, John Yen, Peng Liu, and Robert F. Erbacher. “Automate Cybersecurity Data Triage by Leveraging Human Analysts' Cognitive Process.” In *2016 IEEE 2nd International Conference on Big Data Security on Cloud (BigDataSecurity)*, IEEE International Conference on High Performance and Smart Computing (HPSC), and IEEE International Conference on Intelligent Data and Security (IDS), pp. 357-363. IEEE, 2016.
- Maggie X. Cheng*, Quanmin Ye, Xiaochun Cheng, Robert F. Erbacher, “Network coding and coding-aware scheduling for multicast in wireless networks,” *Proceedings of the IEEE International Conference on Communications (ICC)*, London, UK, June 2015, pp. 5703-5708.
- Noam Ben-Asher*, Alessandro Oltramari, Robert F. Erbacher, Cleotilde Gonzalez, “Ontology-based Adaptive Systems of Cyber Defense,” *Proceedings of the Conference on Semantic Technology for Intelligence, Defense, and Security (STIDS)*, Fairfax, VA, November 2015, pp. 34-41.
- Chen Zhong*, John Yen, Peng Liu, Rob Erbacher, Renee Etoty, Christopher Garneau “An Integrated Computer-Aided Cognitive Task Analysis Method for Tracing Cyber-Attack Analysis Processes,” *Proceedings of the 2015 Symposium and Bootcamp on the Science of Security (HotSoS)*. ACM, New York, NY, USA, 2015, pp. 9-19.
- Chen Zhong*, John Yen, Peng Liu, Robert Erbacher, Renee Etoty, and Chris Garneau, “ARSCA: A Computer Tool for Tracing the Cognitive Processes of Cyber-Attack Analysis,” *Proceedings of the Cognitive Methods in Situation Awareness and Decision Support (CogSIMA)*, 2015 IEEE International Inter-Disciplinary Conference on, 9-12 March 2015, pp.165-171.
- Sulabh Bhattarai*, Sixiao Wei, Stephen Rook, Wei Yu, Robert F. Erbacher, and Hasan Cam, “On Simulation Studies of Jamming Threats Against LTE Networks,” *Proceedings of the IEEE International Conference on Computing, Networking, and Communications*, February 2015, Anaheim, CA, pp. 99-103.
- Steve Hutchinson*, John Wittkamper, Jovina Allen, and Robert F. Erbacher, “cnetmon: A Curses-Based Network Interface Activity Monitor,” *Proceedings of the International Conference on Software Engineering Research and Practice (SERP)*, July 2015, p. 157-163.
- Steve Hutchinson* and Robert F. Erbacher, “ASN reputation system model,” Proc. SPIE 9458, *Proceedings of Cyber Sensing 2015*, 94580A, May 14, 2015.
- Jun Xu*, Pinyao Guo, Mingyi Zhao, Robert F. Erbacher, Minghui Zhu, Peng Liu, “Comparing Different Moving Target Defense Techniques” *Proceedings of the ACM Moving Target Defense Conference*, Scottsdale, Arizona, November 2014, pp. 97-107.
- Chu Huang*, Sencun Zhu, Robert F. Erbacher, “Toward Software Diversity in Heterogeneous Networked Systems,” *Proceedings of the IFIP WG 11.3 Conference on Data and Applications Security and Privacy (DBSec)*, Vienna, Austria, July 2014, pp. 114-129.
- Nirupama Talele*, Jason Teutsch, Robert Erbacher, and Trent Jaeger, “Monitor Placement for Large-Scale Systems,” *Proceedings of the ACM Symposium on Access Control Models and Technologies (SACMAT)*, London, ON, Canada, June 2014, pp. 29-40.
- Chen Zhong*, Deepak Samuel, John Yen, Peng Liu, Robert F. Erbacher, Steve Hutchinson, Renee Etoty, Hasan Cam, and William Glodek, “RankAOH: Context-driven Similarity-based Retrieval of Experiences in Cyber Analysis,” *Proceedings of the IEEE Conference on Cognitive Methods in Situation Awareness and Decision Support (CogSIMA)*, San Antonio, TX, March 2014, pp.230,236.
- Maggie Cheng*, Quanmin Ye, Robert F. Erbacher, “Characterization and Visualization of Sophisticated Scanning Attacks,” *Proceedings of the IEEE Communications and Information Systems Security Symposium*, June 2013, pp. 2047-2051.
- Nirupama Talele*, Jason Teutsch, Trent Jaeger, and Robert F. Erbacher, “Using Security Policies to Automate Monitor Placement,” *Proceedings of the IEEE Conference on Engineering Secure Software and Systems (ESSOS)*, Paris, France, February 2013, pp. 17-32.
- Maggie Cheng*, Quanmin Ye, Robert F. Erbacher, “Visualizing Graph Features for Scanning Attack Detection,” *Proceedings of CSIRW*, Oak Ridge, TN, January 2013.
- Maggie Cheng*, Mariesa Crow, Robert F. Erbacher, “Vulnerability Analysis of a Smart Grid with Monitoring and Control System,” *Proceedings of CSIRW*, Oak Ridge, TN, January 2013.
- Robert F. Erbacher and Steve Hutchinson*, “Extending Case-Based Reasoning to Automated Alert Assessment,” *Proceedings of the ASE International Conference on Cyber Security*, Washington, DC, December 2012.
- Robert F. Erbacher*, “Visualization Design for Immediate High-Level Situational Assessment,” *Proceedings of*

the IEEE Workshop on Visualization for Computer Security, Seattle, WA, October 2012.

- Jeff Rowe*, Karl N. Levitt, Tufan Demir, Robert F. Erbacher, “Artificial Diversity as Maneuvers in a Control Theoretic Moving Target Defense,” *Proceedings of the National Moving Target Research Symposium*, Annapolis, MD, June 2012.
- Robert F. Erbacher and Steve Hutchinson*, “Distributed Sensor Objects for Intrusion Detection Systems,” *Proceedings of the International Conference on Information Technology - New Generations (ITNG)*, Las Vegas, NV, April, 2012, pp. 417-424.
- Michael J. Shevenell* and Robert F. Erbacher, “Design and Implementation of an Open Network and Host-Based Intrusion Detection Test bed with an Emphasis on Accuracy and Repeatability,” *Proceedings of the International Conference on Information Technology - New Generations (ITNG)*, Las Vegas, NV, April, 2012, pp. 409-416.
- Robert F. Erbacher*, Anupama Biswas, and Trent Cameron, “A Novel Data Reduction Technique,” *Proceedings of the Cyber Security and Information Intelligence Research Workshop*, Oakridge, TN, October 2011, Article 35.
- Robert F. Erbacher*, Steve Hutchinson, and Joshua Edwards, “Web Traffic Profiling and Characterization,” *Proceedings of the Cyber Security and Information Intelligence Research Workshop*, Oakridge, TN, October 2011, Article 71.
- Robert F. Erbacher*, “Preparing for the Next WikiLeaks: Making Forensics Techniques Work,” *Proceedings of the 6th IEEE International Workshop on Systematic Approaches to Digital Forensic Engineering*, Oakland, CA, May 2011, pp. 1-8.
- Robert Whitaker and Robert F. Erbacher*, “A Tri-Linear Visualization for Network Anomaly Detection,” *Proceedings of the SPIE '2011 Conference on Visualization and Data Analysis*, San Francisco, CA, January 2011, pp. 78680P-1...78680P-12.
- Robert F. Erbacher*, “Validation for Digital Forensics,” *Proceedings of the The International Conference on Information Technology - New Generations (ITNG)*, Las Vegas, NV, April 2010, pp. 756-761.
- Robert F. Erbacher*, Deborah A. Frincke, Sarah J. Moody, Glenn Fink, “Cognitive Task Analysis of Network Analysts and Managers for Network Situational Awareness,” *Proceedings of the SPIE 2010 Conference on Visualization and Data Analysis*, Santa Clara, CA, January 2010, pp. 75300H-1-75300H-12. *Best Paper Award*.
- Robert F. Erbacher*, “Visualization for Rapid Assessment and Projection in Cyber Situational Awareness,” *Proceedings of the International Conference on Security and Management*, Las Vegas, NV, July 2009, pp. 475-480.
- Robert F. Erbacher*, Jason Daniels, and Steenia Monteiro, “OleDetection: Forensics and Anti-Forensics of Covert Channels in OLE2-Formatted Documents,” *Proceedings of the 4th IEEE International Workshop on Systematic Approaches to Digital Forensic Engineering*, Oakland, CA, May 2009, pp. 85-96.
- Steenia Dominica Steven Monteiro* and Robert F. Erbacher, “Exemplifying Attack Identification and Analysis in a Novel Forensically Viable Syslog Model,” *Proceedings of the 3rd IEEE International Workshop on Systematic Approaches to Digital Forensic Engineering*, Oakland, CA, May 2008, pp. 57-68.
- Sarah J. Moody* and Robert F. Erbacher, “SÁDI – Statistical Analysis for Data type Identification,” *Proceedings of the 3rd IEEE International Workshop on Systematic Approaches to Digital Forensic Engineering*, Oakland, CA, May 2008, pp. 41-54.
- Robert F. Erbacher*, Adele Cutler, Pranab Banerjee, and Jim Marshall, “A Multi-Layered Approach to Botnet Detection,” *Proceedings of the International Conference on Security and Management*, Las Vegas, NV, July 2008, pp. 301-308.
- Robert F. Erbacher*, “Steps for Improving Data Comprehension for Digital Security and Forensics,” *Proceedings of the International Conference on Security and Management*, Las Vegas, NV, July 2008, pp. 318-326.
- Robert F. Erbacher, “The Forensic Validity of Visual Analytics,” *Proceedings of the SPIE 2008 Conference on Visualization and Data Analysis*, San Jose, CA, January, 2008, pp. 68090H-1-68090H-10. *Invited Paper*.
- Vikas P. Deshpande*, Robert F. Erbacher, and Chris Harris, “An Evaluation of Naïve Bayesian Anti-Spam Filtering Techniques,” *Proceedings of the IEEE Information Assurance Workshop*, West Point, NY, June 2007, pp. 333-340.
- Robert F. Erbacher*, “Exemplifying the Inter-Disciplinary Nature of Visualization Research,” *Proceedings of IV07: 11th International Conference Information Visualization*, Zurich, Switzerland, July 2007, pp. 623-630.
- Robert F. Erbacher* and Deborah A. Frincke, “Hierarchical Linked Views,” *Proceedings of the 2007 Coordinated and Multiple Views in Exploratory Visualization Conference*, Zurich, Switzerland, July 2007, pp.

35-46.

- Richard Swart* and Robert F. Erbacher, "Legal Developments in eDiscovery: Implications for Security Management," *Proceedings of the 6th Security Conference*, Las Vegas, NV, 12 Pages, April 2007.
- Robert F. Erbacher, Shashi Prakash*, Chet Claar, Jason Couraud, "Intrusion Detection: Detecting Masquerade Attacks Using UNIX Command Lines," *Proceedings of the 6th Security Conference*, Las Vegas, NV, 18 Pages, April 2007.
- Robert F. Erbacher* and John Mulholland, "Identification and Localization of Data Types within Large-Scale File Systems," *Proceedings of the 2nd International Workshop on Systematic Approaches to Digital Forensic Engineering*, Seattle, WA, April 2007, pp. 55-70. *Best Paper Award*.
- Robert F. Erbacher*, Kim Christensen, and Amanda Sundberg, "Visual Forensic Techniques and Processes," *Proceedings of the 9th Annual NYS Cyber Security Conference Symposium on Information Assurance*, Albany, NY, June 2006, pp. 72-80.
- Sheldon Teerlink* and Robert F. Erbacher, "Foundations of Visual Forensic Analysis," *Proceedings of the IEEE Information Assurance Workshop*, West Point, NY June 2006, pp. 192-199. *Best Paper Nomination*.
- Robert F. Erbacher, Richard Swart*, and Matt Harris, "Computer Forensics: Training and Education," *Proceedings of the 5th Security Conference*, Las Vegas, NV, 10 Pages, April 2006.
- Robert F. Erbacher*, Kim Christensen, and Amanda Sundberg, "Designing Visualization Capabilities for IDS Challenges," *Proceedings of the IEEE Workshop on Visualization for Computer Security*, Minneapolis, MN, October 2005, pp. 121-127.
- Robert F. Erbacher*, "Extending Command and Control Infrastructures to Cyber Warfare Assets," *Proceedings of the IEEE Systems, Man, and Cybernetics (SMC)*, Waikoloa, HI, October 2005, pp. 3331-3337.
- Yarden Livnat, Jim Agutter, Shaun Moon, Robert F. Erbacher*, and Stefano Foresti, "A Visualization Paradigm for Network Intrusion Detection," *Proceedings of the IEEE Information Assurance Workshop*, West Point, NY June 2005, pp. 92-99. *Best Paper Nomination*.
- Robert F. Erbacher* and Menashe Garber, "Visualization Techniques for Intrusion Behavior Identification," *Proceedings of the IEEE Information Assurance Workshop*, West Point, NY, June 2005, pp. 84-91.
- Robert F. Erbacher* and Menashe Garber, "Real-Time Interactive Visual Port Monitoring and Analysis," *Proceedings of the International Conference on Security and Management*, Las Vegas, NV, June 2005, pp. 228-234.
- Michael Farnsworth* and Robert F. Erbacher, "Global Illumination: Efficient Renderer Design and Architecture," *Proceedings of the International Conference on Geometric Modeling, Visualization & Graphics 2005*, Salt Lake City, UT, July 2005, pp. 1691-1695.
- David McDonald and Robert F. Erbacher*, "Hardware Accelerated Graphics in Java," *Proceedings of the International Conference on Geometric Modeling, Visualization & Graphics 2005*, Salt Lake City, UT, July 2005, pp. 1708-1712.
- Robert F. Erbacher* and Menashe Garber, "Interactive and Dynamic Visual Port Monitoring and Analysis," *Proceedings of the International Conference on Geometric Modeling, Visualization & Graphics 2005*, Salt Lake City, UT, July 2005, pp. 1704-1707.
- Zhifu You*, Charles L. Thomas, and Robert F. Erbacher, "A 3D Shape Measurement System," *Proceedings of the International Conference on Geometric Modeling, Visualization & Graphics 2005*, Salt Lake City, UT, July 2005, pp. 1686-1690.
- Robert F. Erbacher* and Menashe Garber, "Fusion and Summarization of Behavior for Intrusion Detection Visualization," *Proceedings of the IASTED International Conference On Visualization, Imaging, and Image Processing*, Marbella, Spain, September 6 - 8, 2004, pp. 159-165.
- Robert F. Erbacher*, "Analysis and Management of Intrusion Data Collection," *Proceedings of the 2004 International Conference on Security and Management (SAM '04)*, Las Vegas, NV, June 2004, pp. 179-185.
- Robert F. Erbacher*, "Intrusion Behavior Detection through Visualization," *Proceedings of the IEEE Systems, Man & Cybernetics Conference*, Crystal City, Virginia, October 2003, pp. 2507-2513.
- Robert F. Erbacher* and Zhouxuan Teng, "Analysis and Application of Node Layout Algorithms for Intrusion Detection," *Proceedings of the SPIE 2003 Conference on Visualization and Data Analysis*, Santa Clara, CA, January, 2003, pp. 160-170.
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- "ARO/RDECOM support for Advanced Computing in South America," Brazil Universidade Estadual Paulista (UNESP) 07/27/2016
- "ARO/RDECOM support for Advanced Computing in South America," Brazil Federal University of ABC 07/20/2016
- "ARO/RDECOM support for Advanced Computing in South America," Brazil Laboratório Nacional de Computação Científica (LNCC) 07/11/2016
- "Cognitive Foundations of Cyber Security," Army Research Office 05/15/2015
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- “Network Security,” USU Free Software and Linux Club, Logan, UT. 3/2004
- “University Related Computer Security Issues and solutions,” Panelist: USU Computer Security Week. *University Related IT Security Issues Panel*, Logan, UT. 11/2003
- “Visualization: Visual Data Exploration and Analysis for Genomic and Biological Sciences,” USU Biotechnology and Genomics Research Center Seminar Series, Logan, UT. 10/2003

- “Improving Intrusion Analysis Effectiveness,” The Workshop on Statistical and Machine Learning Techniques in Computer Intrusion Detection, Washington, DC. 9/2003
- “Improving Intrusion Analysis Effectiveness,” Utah State University, Logan, UT. 3/2003
- “Improving Intrusion Analysis Effectiveness,” New York State Cyber-Security Symposium, Utica, NY. 2/2003
- “Lab-Based Instructional Facilities and Issues,” Panelist: Teaching Computer and Network Forensics, *2002 Workshop on Computer Forensics*, Moscow, ID. 9/2002
- “Visualization in Detection of Intrusions and Misuses,” Computing Laboratory, University of Kent. 7/2000
- “Visual Assistance for Concurrent Processing,” Department of Computer & Information Science & Engineering, University of Florida. 4/1999
- “Visual Assistance for Concurrent Processing,” Department of Computer Science, University at Albany - SUNY. 4/1999
- “Visual Assistance for Concurrent Processing,” Department of Computer Science, Florida State University. 4/1999
- “Visual Assistance for Concurrent Processing,” Department of Computer Science, Western Michigan Univ. 3/1999
- “Visual Assistance for Concurrent Processing,” Department of Computer Science, Oregon State University. 3/1999
- “Visual Assistance for Concurrent Processing,” Department of Computer Science, University of Alabama. 3/1999
- “Visual Assistance for Concurrent Processing,” Department of Computer Science, University of Idaho. 4/1998

Professional Activities:

External:

Editorialships:

- Editor: Journal of Convergence Information Technology 2010-Present
- Associate Editor: The Journal of Electronic Imaging 2000-2016
- Article Editor: SAGE Open Manuscript 2014
- Associate Editor: Proceedings of the International Conference on Imaging Science, Systems, and Technology 2001
- Guest Editor: The Journal on Electronic Imaging: Special Issue on Visualization and Data Analysis 2000

Conference Committees:

- Steering Committee: Visualization and Data Analysis 2011-2014
- Steering Committee: Systematic Approaches to Digital Forensics Engineering (SADFE) 2011-2016
- Program Co-Chair: International Symposium on Digital Forensics and Information Security (DFIS) 2012
- General Chair: Systematic Approaches to Digital Forensics Engineering (SADFE) 2009-2011
- Publications Chair: Workshop on Visualization for Cyber Security (VizSec) 2009
- Publications Chair: Systematic Approaches to Digital Forensics Engineering (SADFE) 2007-2008
- Conference Co-Chair: Visualization and Data Analysis 2002-2007
- Track Chair: 6th Security Conference, Digital Forensics Track. 2007
- Program Chair: High Performance Computing Symposium (Advanced Simulation Technologies Conference) 2004
- Applications Co-Chair: IEEE Visualization 2003
- Posters Co-Chair: IEEE Visualization 2002
- Conference Co-Chair: Visual Data Exploration and Analysis, II-VIII 1995-2001
- Workshops and BOF's Co-Chair: IEEE Visualization 1999-2001
- Workshop Co-Organizer: Fundamental Issues in Visualization 2001 2001
- Audio Visual Co-Chair: IEEE Visualization 1997-1998

Program Committees:

- International Conference on Emerging Security Information, Systems and Technologies (SecureWARE) 2015

• IEEE International Inter-Disciplinary Conference on Cognitive Methods in Situation Awareness and Decision Support (CogSIMA)	2015
• Moving Target Defense (MTD)	2014-2015
• IEEE Visualization Workshop on Visualization for Computer Security (VizSec)	2005-2006, 2008-2014
• International Conference on IT Convergence and Security (ICITCS)	2011, 2014
• IJCNN Special Session on Neuromorphic Science Technology for Cybersecurity	2013
Program Committee for International Conference on Data Mining and Intelligent Information Technology Applications	2013
• ICF' CyberSci Summit 2013 Conference	2013
• IASTED International Conference on Computers, Graphics and Imaging (CGIM)	2003-2005, 2008, 2011- 2013
• Systematic Approaches to Digital Forensics Engineering (SADFE)	2007-2008, 2010-2011, 2013, 2015
• Workshop on Security and Forensics in Communication Systems (SFCS)	2012
• Cyber Security and Information Intelligence Research Workshop (CSIIRW)	2011-2012
• International Conference on Next Generation Information Technology (ICNIT)	2011
• IASTED International Conference on Graphics and Virtual Reality (GRVR)	2011
• International Conference on Mechanical Engineering and Information Technology (MEIT 2011)	2011
• International Symposium on Forensics for Future Generation Communication environments (F2GC)	2007-2011
• International Conference on Networked Computing and Advanced Information Management (NCM)	2010-2011
• International Conference on Computer Sciences and Convergence Information Technology (ICCIT)	2010
• SECRIPT (Int'l Conf on Security and Cryptography)	2006-2009
• SPIE Conference on Visualization and Data Analysis	2008-2009
• International Conference on Digital Forensics & Cyber Crime (ICDF2C)	2009
• IEEE InfoVis Conference	2003, 2007- 2008
• International Conference on Coordinated & Multiple Views in Exploratory Visualization	2003-2005, 2007
• IEEE Information Assurance Workshop	2005-2007
• International Conference on Information Science and Security	2007, 2015
• The International Conference on Security and Management	2003-2004, 2006
• Image producing, sending, and mining (Image)	2006
• IEEE Visualization Conference	2005
• International Conference on E-business and Telecommunication Networks	2005
• Workshop on Visualization and Data Mining for Computer Security	2004
• IEEE InfoVis Conference	2001-2002
• The International Conference on Imaging Science, Systems, and Technology	2001
Session Chair:	
• SPIE Conference on Visualization and Data Analysis	2002-2008, 2010-2011
• Systematic Approaches to Digital Forensics Engineering (SADFE)	2008, 2010
• IEEE Visualization Workshop on Visualization for Computer Security	2005, 2009
• Security and Management (SAM)	2008
• IEEE International Conference on Information Visualization	2007
• 9th Annual NYS Cyber Security Conference Symposium on Information Assurance	2006
• Information Assurance Workshop, West Point	2006
• IASTED VIIP Conference	2001, 2005
• COI Workshop on Security in Large-Scale Computing, breakout session	2005
• IEEE International Conference on Systems, Man, and Cybernetics	2005

- IEEE Visualization Conference 2001-2003
- International Symposium on Information Systems and Engineering 2002
- SPIE Conference on Visual Data Exploration and Analysis 1995-2001
- The International Conference on Imaging Science, Systems, and Technology 2001

Other:

- CyberSA CONOPS Working Group 2015
- National Science Foundation SaTC 2025 Panel (Invite Only) 2014
- Army Research Lab rep for the Cyber Materiel WG on Cyber Situational Awareness Materiel Development Group 2014-Present
- GSTOC - National Research Council (NRC) Committee on Globalization of S&T Opportunities and Challenges (GSTOC) for DOD (Acted as cyber security SME) 2013
- The Technical Cooperation Program - Command, Control, Communications, and Information Systems Group - Technical Panel 11: Information Assurance and Defensive Information Warfare (TTCP C3I TP11) 2011-Present
- Information Assurance Technology Analysis Center's Subject Matter Expert 2011-Present
- CMU CyLab Review Panel 2011
- Organizer: WikiLeaks/Manning Panel, held at SADFE 2011
- Assisted SDL in the organization of their Workshop on Visualization in Cyber Conflict. Identified and recruited invited speakers and attendees. 2007
- BOF Co-Organizer, IEEE Visualization Conference, "Using Visualization to Support Security-Relevant Information Understanding in Very Large Scale Infrastructures and Networks," with D. Frincke, B. Yurcik, C. North, and G. Schmidt 2005
- Student Volunteer, IEEE Visualization Conference 1991-1992

College:

- Bioinformatics Faculty Search Committee 2001
- Judge: Undergraduate Research Colloquium 2000
- Academic Support Committee 2000

Department:

- Chair, CS3100 Textbook Committee 2006-2010
- ACM Chapter Advisor 2006-2010
- Contest Team Committee 2004-2009
- Departmental Placement Exam Committee (Operating Systems) 2004-2008
- Planning Committee: Senior Graduation Dinner 2005-2008
- Doctoral Program and Qualifier Re-Examination Committee 2008
- CS/MIS Relations Committee 2006-2007
- PhD Qualifiers Oral Committee (Chair) 2004
- CS3100 Textbook Committee 2004
- Capstone Course Committee 2004
- Undergraduate Curriculum Committee 2000-2003
- Computer Oversight Committee 2001-2003
- Undergraduate Advisor: 25+ Students 2003
- Undergraduate Advisor: 35+ Students 2002
- Undergraduate Advisor: 20+ Students 2001
- Undergraduate Advisor: 10+ Students 2000

Colloquiums Arranged (External Speakers)

- Stefano Foresti (Xapio), "Captmail: convergence and compliance of emails and files" 2008
- Kevin A. Kwiat (AFRL-Rome Labs), "Is Network Message Loss Malicious or Not? - A Game-Theoretic Approach" 2007
- Jim Agutter and Stefano Foresti (University of Utah), "Generic Visualizations for Decision Makers" 2005

Notable Meetings Attended (Not Listed or Implied Elsewhere)

- Nato IST 108 meeting 2015
- ARO MTD MURI Kickoff 2014
- ARL Cyber CRA Kickoff 2014
- OSD/DoD SBIR Meeting 2012
- ARO MURI Topic Review Meeting 2011
- CMU CyLab Review 2011
- IEEE Systematic Approaches to Digital Forensics Engineering 2008-2010
- Visual Analytics: The Next Five Years, VAC Consortium Meeting 2009
- Darpa Seed Grant PI Meeting 2008
- IEEE Security and Privacy Symposium 2008
- Visualization Summit, Aesthetics Working Group 2007
- AFRL-Rome Labs Info Challenges Conference 2005-2006
- IEEE Visualization 1999-2005
- ARDA PI Meeting 2004

Reviewing:

- NSF: Proposal Reviewer/Panelist 2003,2005,
2008×2,
2009, 2012-
2013
- ARO Conference Proposal Reviewer 2015,
2016×3
- ARO STIR Reviewer 2014
- ARO MURI Reviewer 2012, 2013
- ARO BAA Proposal Reviewer 2012×3,
2013,
2015×5,
2016×2
- ARO STTR Proposal Reviewer 2013,
2016×3
- ARO SBIR Proposal Reviewer 2012
- ORNL LTRD Proposal Reviewer 2011
- ARL Internal TRAC Proposal Reviewer 2011
- Swiss National Science Foundation: Proposal Reviewer 2008

Journals:

- International Journal of Parallel, Emergent and Distributed Systems 2015
- Security and Communication Networks 2015
- The Scientific World Journal 2014
- Elsevier Computers & Security 2014×3,
2015×3,
2016×3
- Journal of Cognitive Engineering and Decision Making 2014
- Journal of Network and Computer Applications 2014
- Springer Journal of Supercomputing 2013-2014
- IASTED International Journal of Computers and Applications 2004, 2010,
2012,
2014×3
- IEEE Transactions on Parallel and Distributed Systems 2013
- Elsevier Journal of Visual Languages and Computing 2003, 2010,
2012, 2013
- Transactions on Information Forensics & Security 2013×3

- The Electronic and Telecommunication Research Institute Journal (ETRI Journal) 2003, 2008, 2010×2, 2013×3,
 - IEEE Computer 2012
 - The International Journal of Information Visualization 2003, 2010×2, 2011×2, 2012×3, 2015×2
 - IEEE Computer Graphics and Applications 2004×2, 2012 2005×3, 2007, 2011×2, 2012,
 - International Journal of Advancements in Computing Technology 2011
 - Journal of Visualization 2011
 - Journal of Convergence Information Technology 2010, 2011×2
 - IEEE Transactions on Visualization and Computer Graphics 2001-2002, 2006, 2009×2, 2010-2011
 - Journal of Visual Communication and Image Representation 2007-2009
 - IETE Technical Review 2009
 - IBM Systems Journal 2008
 - Wireless Personal Communications 2008
 - Optical Engineering 2006
 - IEEE Transactions on Knowledge and Data Engineering 2006
 - IEEE Transactions on Secure and Dependable Computing 2004-2005
 - IEEE Software 2005
 - IEEE Security and Privacy 2004
 - The Bioinformatics Journal (Oxford Journals) 2003
- Conferences:
- International Conference on Information Science and Security 2015
 - International Conference on Emerging Security Information, Systems and Technologies (SecureWARE) 2015
 - Moving Target Defense Conference 2014, 2015
 - IEEE Conference on Visual Analytics Science and Technology (IEEE VAST) 2013-2014
 - International Conference on Computer Graphics, Visualization, and Computer Vision (WSCG) 2001-2014
 - International Multi-Conference on Society, Cybernetics and Informatics (IMSCI) 2011, 2014, 2015
 - IEEE Conference on Visual Analytics Science and Technology (IEEE VAST) Challenge 2011, 2014
 - IEEE Information Visualization Symposium 2001-2009, 2014
 - International Conference on Education, Training and Informatics (ICETI) 2010-2011, 2014, 2015
 - IEEE Visualization Workshop on Visualization for Computer Security (VizSec) 2005-2006, 2008-2014
 - International Conference on Education and Information Systems, Technologies and Applications: EISTA 2007-2009, 2011, 2013-2014
 - International Conference on Data Mining and Intelligent Information Technology Applications 2013
 - IEEE Control Systems Society Conference Management System 2013

- IASTED International Conference on Computers, Graphics, and Imaging (CGIM) 2003-2005,
2007-2008,
2010-2013
- International Conference on Digital Content, Multimedia Technology and its Applications (IDCTA) 2012
- International Conference on Next Generation Information Technology (ICNIT) 2012
- Cyber Security and Information Intelligence Research Workshop (CSIIRW) 2011-2012
- International Conference on Education, Informatics, and Cybernetics (icEIC) 2011, 2012
- International Conference on Advanced Information Management and Service 2011
- International Conference on Interaction Sciences: IT, Human and Digital Content 2011
- Information Technology Interfaces (ITI) 2011
- IASTED International Conference on Graphics and Virtual Reality (GRVR) 2011
- SPIE Conference on Visualization and Data Analysis (VDA) 2002-2011
- International Conference on Information Technology Interfaces (NCM) 2010-2011
- Systematic Approaches to Digital Forensics Engineering (SADFE) 2007-2008,
2010-2011,
2015
- International Conference on Politics and Information Systems, Technologies and Applications (PISTA) 2011
- International Conference on Computer Sciences and Convergence Information Technology 2010
- International Symposium on Engineering Education and Educational Technologies 2010
- International Conference on Networked Computing and Advanced Information Management 2010
- International Workshop on Forensics for Future Generation Communication environments 2007, 2009-
2010
- IEEE Visualization 2000-2001,
2003-2009
- IEEE Visual Analytics Science and Technology 2006-2009
- SECRIPT (Int'l Conference on Security and Cryptography) 2006-2009
- International Conference on Education and Information Systems: Technologies and Applications 2005,2008
- International Conference on Coordinated & Multiple Views in Exploratory Visualization 2003-2005,
2007
- The IEEE SMC Information Assurance Workshop 2005-2007
- IASTED International Conference on Graphics and Visualization in Engineering 2006-2007
- International Conference on E-Business and Telecommunication Networks 2005
- IASTED International Conference on Visualization, Imaging, and Image Processing 2001, 2002,
2004
- IEEE Visualization Conference (Applications papers) 2003-2004
- International IPSI-2004: Symposium on Challenges in the Internet and Interdisciplinary Research 2004
- International Conference on Information Visualization 2004
- IASTED Modeling, Simulation and Optimization 2004
- IASTED Applied Simulation and Modeling 2004
- High Performance Computing Symposium (Advanced Simulation Technologies Conference) 2004
- IASTED International Conference on Circuits, Signals, and Systems 2003
- IASTED Conference on Applied Informatics 2003
- IASTED Conference on Modeling, Identification, and Control 2003
- IASTED Conference on Applied Modeling and Simulation 2002
- Engineering and Applications (SEA 2002) 2002
- SPIE Conference on Visual Data Exploration and Analysis 1995-2001
- Workshop on Fundamental Issues of Visualization 2001
- International Conference on Computer Graphics, Visualization and Interactive Digital Media 2000
- International Conference in Central Europe on Computer Graphics and Visualization 1999
- IEEE InfoVis LBHT 1999

Books:

- Springer US 2005-2006

- John Wiley & Sons 2004
- Morgan-Kaufman 2001
- SPIE Press 1999-2001

Student Advising (Dates listed indicate when defenses were passed):

Masters Thesis Advisor (and 6970 Advisor):

- RB Whitaker, "Applying Information Visualization to Computer Security Applications" 04/2010
- Anupama Biswas, "Impact and Analysis of System and Network Attacks" 11/2008
- Ryan Shelley, "A novel technique of network auditability with managers in the loop" 05/2008
- Steena Monteiro, "A Novel Authentication and Validation Mechanism for Analyzing Syslogs Forensically" 05/2008
- Sarah Moody, "Automated Data Type Identification and Localization using SÁDI - Statistical Analysis Data Identification" 05/2008
- Jason Daniels, "Forensic and Anti-Forensic Techniques for OLE2-Formatted Documents" 05/2008
- Quint Wheeler, "A Secure Database Implementation for Personal Information Storage" 11/2006
- Sheldon Teerlink, "Visual Forensic Analysis of Hard Disks" 12/2004

Masters Project Advisor (and 6970 Advisor):

- Harish Kumar Modugu, "DMMasker: A Data Sanitization Tool for Ideasis" 6/2010
- Gokul Krishnan, "Extending Search Capabilities of Advanced Network Situational Awareness Tools" 6/2010
- Santhi Swarup, "Integrating Maps into AdviseAid" 6/2010
- Srinidhi Kakani, "Clustering Files: Digital Profile System" 11/2008
- Anusha Davuluri, "Force-Based Visualization" 07/2008
- Sriram Iyer, "Network Data Miner" 12/2006
- Shashi Prakash, "Intrusion Detection: Detecting Masquerades Using UNIX Commands" 9/2005
- Zhifu You, "A 3D Shape Measurement System" 3/2005
- Srilakshmi Bobba, "Enhanced Security for Credit Card Databases" 2/2005
- Vikas Deshpande, "An Evaluation Of Filtering Techniques In Naïve Bayesian Spam Filter" 11/2004
- Scott Ivani, "UNIX File Scanner and Virus Checker" 7/2003
- Siddarth Pandit, "Visual Intrusion Detection Interaction" 7/2003
- Phyo Nyunt - "Intrusion Detection System Collection of Data and Visualization" 7/2003
- Menashe Garber - "Intrusion Detection Visualization and Analysis" 7/2003
- Min Wu - "Applications of Information Retrieval Techniques to Intrusion Detection" 6/2003
- Narayana Vadlamani - "Research into Collaborative Virtual Environments" 8/2002
- Zhouxuan Teng - "Visualization for Intrusion Detection" 5/2002
- Kenneth Walker - "Research into Visual Intrusion and Misuse Detection" 5/2001
- Ken Swarner - "Visualization of Gel Generated Gene Comparisons" 5/2000

Doctoral Dissertation Advisor:

- Steena Monteiro (USU) 5/08-12/09

Doctoral Dissertation Committee:

- Chen Zhong (PSU) 11/14-Present

Masters Project Committees:

- Keerthana Janaswami, "ShopMobile: A Mobile Shopping Aid for Visually Impaired Individuals" 2/2010
- Ravi Shankar Sathish, "TRIP AND RECREATION MAP SERVER (TRMS)" 8/2004

Masters Thesis Committees:

- Renée Etoty, "Evaluation of the Presentation of Network Data via Visualization Tools for Network Analysts: Comparison of Node-Link, Parallel Coordinates and Tabular Displays" 05/2014

- Sathyaraj Balasubramanian, “Strides Towards Better Application Security” 11/2008
- Brian Norman, “Botnet Analysis and Classification” 12/2007
- Mansi Amin, “Analysis of a Combined Scheme of Digital Watermarking and Compression” 6/2005
- Terry G. Ballard, “Optical Flow Structure, Retinal Field, and the Perception of Ego Speed” 5/1999

Teaching and Other Research Mentoring:

Tutorials:

- “Introduction to Digital Forensics Research.” At the 2008&2009 Security and Management Conference, Las Vegas, NV. 7/2008, 7/2009
- “Introduction to Information Assurance: How secure is your data?” at the SPIE Symposium on Electronic Imaging, Santa Clara, CA. 1/2003

Undergraduate Courses (1000-4000):

- Operating Systems, 3100 (Spr ‘2005-‘2010): 15-40 Students/Class
- Introduction to Computer Graphics, 5400 (Spr ‘1999, Fall ‘1999-‘2002): 25-35 *Students/Class*
- Systems Programming (Spr ‘2000-‘2003): 100-150 *Students/Class*
- Introduction to Programming and Problem Solving using C++ (Fall ‘98, Spr ‘99): 20-30 *Students*
- Introduction to Computer Science (Fall ‘98): 20-30 *Students/Class*
- Exploring the Internet (Spr ‘96, 2×Spr ‘97, 3×Sum ‘97, Fall ‘97, 2×Spr ‘98): 20-30 *Students/Class*

Graduate Courses (5000+):

- Doctoral Seminar, 7900 (Spring ‘2007)
- Advanced Computer Security Research, 7460 (Fall ‘2005, Spring ‘2007, Fall ‘2008, Fall ‘2009): 4-30 *students/Class*
- Computer Security, 6450 (Spr 2003, Spr ‘2004-‘2006, Fall ‘2006, Spring ‘2008): 15-35 *Students/Class*
- Computer Visualization (Spr ‘2001-‘2002): 5-10 *Students/Class*
- Introduction to Computer Graphics (Spr ‘1999, Fall 1999-2002, Fall ‘2003-‘2009): 10-40 *Students/Class*

Undergraduate Independent Studies (CS5950, CSI 497):

- Stephen Miller - Advanced problem solving techniques and methods Spring 2007
- Joshua Dawson - Integration of user interface design, networking, and databases in web development Summ 2006
- Jason Maughan - Computer forensics based analysis. *Student from ECE.* Spring 2006
- Ryan VanSickle - Computer forensics based analysis. *Student from ECE.* Spring 2006
- Benjamin Galloway - Visualization of sensory input and wave guides Spring 2006
- Erik Falor - Development within a statistical visualization environment Fall 2005
- Carl Ellsworth - Analysis of database model security and effectiveness Fall 2005
- Kim Christensen - Development of an visualization-based IDS architecture and associated techniques Fall 2005
- John Forsyth - Development of a Bioinformatics-based Visualization System Spring 2005
- David McDonald - Comparison and Analysis of Web-Based Graphics APIs Fall 2004
- Alan Sorensen - Explore modification to a visual intrusion detection environment Summ 2004
- Sean Spillane - Enhancements to visual intrusion detection and monitoring facilities and infrastructure Spring 2003
- Christopher Kardell - Visual simulation of wireless networks Fall 2002
- Steve Hart - User interfaces for analyst feedback Spring 2002
- Brian Kandel - Network traffic simulation and visualization Fall 2001
- Ovais Qadir - Automated file parsing and linking Spring 2001
- Julee MatharKutty - User studies in the analysis of visual gambling perception Spring 2001
- Sean Spillane - Undergraduate teaching assistant for CSI402 - Systems Programming Spring 2000

Undergraduate Senior Projects in Computer Science (CSI 499):

- Nicholas Howansky, Web-based store development Spring 2003
- Karl Sobyak - Interactive Refinement to Intrusion Detection Analysis. *Recipient of a SUNY-Albany Presidential award for undergraduate research as a result of this work.* Fall 2002
- Heather Sundberg - Visual Representation of Gambling Odds For Behavior Modification Spring 2000

Graduate Directed Readings and Independent Studies (CS 7950, CS 6950, CSI 694):

- Steena Monteiro - Background and applications of Basis Functions to Digital Forensics Fall 2009
- Santhi Swarup - Feature development and implementation for visualizations in AdviseAid Spring 2009
- Gokul Krishnan - Identification and implementation of advanced search facilities within AdviseAid Spring 2009
- Harish Kumar Modugu - Analysis of Web-Based Security Techniques Fall 2008
- Steena Monteiro - Network Forensics and Attack Graphs Fall 2008
- Swathi Gudipali - Computer Forensics Spring 2008
- Chris Harris - Self Aware Data with Security and Forensics Fall 2007
- Sarah Moody - Network Forensics Fall 2007
- Manas Narkar - Attack Graph Analysis Fall 2007
- Vineela Kalluru - Legal Admissibility and Digital Forensics Fall 2007
- Anusha Davuluri - State of the Art in Force-Directed Graphs Fall 2007
- Uday Ramayanam - Data hiding Techniques in Computer and Network Forensics Fall 2007
- Anupama Biswas - Impact Analysis of Cyber Attacks Summ 2007
- Shalini Rathnavel - A Literature Survey on Network Forensics Summ 2007
- Trent Cameron - Literature Search and Report on Botnet Detection Algorithms and Techniques Summ 2006
- Sam George - Report on Growth Algorithm Literature Search and Applications to Masters Thesis Spring 2006
- John Mulholland - Report on Background of Intrusion Detection and Computer Security Spring 2006
- Richard Swart - Report on Security Background and User Studies for Forensics and Intrusion Detection Spring 2006
- James Whiteley - Research and Survey of Computer Security Topics Spring 2005
- Shashi Prakash - Wireless Network Security Analysis Spring 2004
- Menash Garber - Network Data Based Port Monitoring and Analysis Fall 2003
- Zhouxuan Teng, "Intrusion Detection and Analysis Literature Survey" Spring 2003
- Pinal Chhowala -Intrusion Detection Research Spring 2003
- Menashe Garber - Game Engine Development Spring 2003
- Niquiche Sangster - Visualization of Biological Data Spring 2002
- Aasavari Gokhale - Research into Data Collection of Data For Network Traffic Monitoring Fall 2001
- Bill Augustine - Research into Data Collection of Data For Network Intrusion Detection Summ 2000
- Xiaochun Huang - Research into Visual Representation of Concurrent Processing For Debugging Spring 2000
- Narayana Vadlamani - Visualization of Hummer Data For Network Intrusion Detection Spring 2000

Curricular Practical Training Co-op Students:

- Stephen Miller - USU CS Department Fall '07
- Cassi Bergman - USU CS Department Spring '04
- Sriram Iyer - Ingeo Systems, Inc. Fall '04
- Kim Christiansen - USU CS Department Fall '04

Other Graduate Advising/Mentoring:

- Steena Monteiro - Internship at PNNL, summer 2009 2007-2009
 - 2008 Grace Hopper ACM Student Research Competition (Poster)
 - Microsoft and IBM Travel Scholarships to the 2008 Grace Hopper conference
 - Full NSF Travel Scholarship to the 2007 Grace Hopper conference
 - 2008 Google Workshop for Women Engineers
 - Presented at SADFE 2008
 - NSF Travel Grant to attend SADFE 2008
- Sarah Moody - 2007 Summer Internship at PNNL 2007-2008

Attended SADFE 2007
 Presented at SADFE 2008
 NSF Travel Grant to attend SADFE 2008
 ACMW Travel Grant to attend SADFE 2008

- Anupama Biswas - 2008 Grace Hopper ACM Student Research Competition (Poster) 2007-2008
 Full NSF Travel Scholarship to the 2008 Grace Hopper conference
 2008 Google Workshop for Women Engineers
 2008 CRA-W Grad Cohort Workshop
- John Mulholland - Attended the 2007 SADFE Workshop 2007
- Karl Sobylak - Attended 2002 Workshop on Computer Forensics. Received a Full Travel Scholarship. 2002

Other Advising/Mentoring:

- *ACM Programming Contest Coach* 2006-2009
- Tech-Topia Regional Software Development Challenge Sponsored by CA. Team included: Stephen Miller, Rajesh Kolla, RB Whitaker, and Kamath Purushotham *Contest Coach/Advisor* 2007
- Undergraduate Senior Project (Engineering) - Scott Haymore, Jason Maughan, and Ryan VanSickle, "Digital Profiler System: Computer Forensics Software" 2006
- *ACM Programming Contest Coach (With Dan Watson)*. 2004-2005
- Josh Wheeler, Alejandro Garcia, Darren D'Orlando, and Matt Jenson – *Microsoft Windows CE Challenge Mentor (With Steve Clyde)*. 2004
- Gyamfi Yaw - Bioinformatics-Based Computation and Analysis. *Ronald McNair Post Baccalaureate Program*. 2003
- Justin Lintz - Network-Based Intrusion Monitoring and Analysis Data Collection Issues 2002
- Karl Sobylak - Histogram-based intrusion signature analysis. *Recipient of a University of Idaho travel grant to attend the 2002 Workshop on Computer Forensics (Based on this work)*. 2002
- Joe Quinion - Intrusion Data Collection Enhancements and Analysis 2002

Guest Lectures:

- CS 7000 - Research Interests and Current Projects Semesterly
2003-2009
- MIS 6800 - Basics of Digital Forensics and Associated Research Directions 3/2008
- ECE 5930 - Computer Security and Forensics Research Directions 8/2007
- CS 3000 - Computer Security Basics, Single Day Lecture Semesterly
2003-2006
- CS 6900 - Visualization and Computer Security Research Overview, single Day Lecture Semesterly
2003-2007

Graduate Interns and Post-Docs

- Eric Graves 03/14-
Present
- Renee Etoty, Towson University 10/12-06/14

Graduate Research Assistants

- Steena Monteiro 5/07-12/09
- RB Whitaker 1/08-6/09
- Chris Harris 1/08-6/09
- Anupama Biswas 1/08-12/08
- Gokul Krishnan 1/08-4/08
- Anusha Davuluri 2/07-4/08
- Srinidhi Kakani 1/07-4/08
- Sarah Moody 2/07-12/07
- Purushotham Kamath 9/06-12/07
- Rajesh Kolla 5/07-12/07

- Matt Manley 9/06-1/07
- John Mulholland 11/05-5/07
- Nirupa Iyer 9/04-12/04
- Ramya Venugopalan 5/06-8/06
- Zheng Lu 5/06-8/06
- Kanti C Surapaneni 9/05-12/05
- Zhouxuan Teng 9/04-5/05
- Kenneth Walker 9/01-6/03
- Kenneth Walker 9/00-5/01

Undergraduate Research Assistants

- Stephen Miller 2/07-2/08
- Jason Newbold 1/08-5/08
- RB Whitaker 9/06-12/07
- John Forsyth 1/05-3/07
- Chad Coats 9/06-1/07
- Kim Christensen 9/04-6/06
- Amanda Sundberg 5/05-6/06
- Cassie Bergman 1/05-9/05
- Karl Sobylak 6/02-5/03

New Courses Developed:

- Advanced Computer Security Research (Doctoral Level) Fall '2005
- Introduction to Information Security and Intrusion Detection (Graduate Level) Spring '2003
- Introduction to Computer Visualization (Graduate Level) Spring '2001

New Curriculums Developed for Existing Courses:

- Computer Security. Deployed a new exam format to more effectively target student understanding. Spring 2008
- Operating Systems. Modified the course to include networking. Added pair programming. Spring 2007
- Advanced Computer Security. Refocused the course on digital forensics Spring 2007
- Introduction to Information Security and Intrusion Detection (Graduate Level). Modified course content to be more up to date. Increased discussion of theory and foundational models. Spring 2005
- Computer Graphics. Switched textbooks from Computer Graphics using OpenGL by Hill to Interactive computer Graphics: A Top Down Approach Using OpenGL by Angel. This switch was made to better meet the needs of the students. Adapted course material to better fit local student population Fall 2004
- Operating Systems. Added security component. Spring 2004
- Systems Programming (Undergraduate Level). Changed textbook and modified course content to be more up to date. Spring 2000
- Computer Graphics (Shared Resource). Modified course to be dependent on OpenGL. Fall 1999