

**Lorie M. Liebrock** ([lorie.liebrock@nmt.edu](mailto:lorie.liebrock@nmt.edu)). 575-835-6729

Cybersecurity Centers, New Mexico Institute of Mining and Technology (NMT), Socorro, NM 87801

DHS ESE Role: Lorie Liebrock will serve as lead for cybersecurity for the COE including serving as the lead for the Transdisciplinary Cybersecurity academic programs and development of related professional development, as well as facilitating support for all cybersecurity research.

**Professional Preparation:**

- Michigan Technological University; Houghton, MI; Major: Computer Science; B.S. 1985
- Michigan Technological University; Houghton, MI; Major: Computer Science; M.S. 1988
- Rice University; Houston, TX; Major: Computer Science; M.S. 1992
- Rice University; Houston, TX; Major: Computer Science; Ph.D., Parallel Processing, 1994

**Research and Professional Experience:**

- July 8, 2019-Jan 4, 2022: Director of New Mexico Cybersecurity Center of Excellence, Professor of Computer Science and Information Technology, ICASA Collaborator, NMT
- July 8, 2019-Jan 4, 2022: Director of New Mexico Cybersecurity Center of Excellence for Economic Development and NMT Cybersecurity Education Center, Professor of Computer Science and Information Technology, ICASA Collaborator, NMT
- August 15, 2011-July 5, 2019: Dean of Graduate Studies, Professor of Computer Science and Information Technology, ICASA Collaborator, Adjunct Professor of Management; NMT
- 2009-2011: Chair and Associate Professor of Computer Science, Associate Professor of Information Technology, ICASA Collaborator, Adjunct Professor of Management, NMT
- 2007-2009, Education Director and Chief Technology Officer New Mexico Computing Applications Center, State of New Mexico
- 2007-2019: Associate Editor, Applied Mathematics and Computation
- 2002-2007: Assistant Professor of Computer Science, Assistant Professor of Information Technology, ICASA Collaborator, Adjunct Professor of Management, NMT
- 2000-2001: Assistant Professor, Department of Mathematical Science, Researcher, Arctic Region Supercomputing Center, University of Alaska, Fairbanks

**Ten Related Publications / Products:**

1. Vincent E. Urias; William M.S. Stout; Jean Luc-Watson; Cole Grim; Lorie Liebrock; Monzy Merza, "Technologies to Enable Cyber Deception", 2017 International Carnahan Conference on Security Technology (ICCST), Oct. 23-26, 2017, DOI 10.1109/CCST.2017.8167793.
2. A.D. Kent, L.M. Liebrock, and J.C. Neil, "Authentication Graphs: Analyzing User Behavior within an Enterprise network", Computers & Security, 2015, doi: 10.1016/j.cose.2014.09.
3. Lorie M. Liebrock, Judy Holcomb, Jesse B. Crawford, Kaley Goatcher, and Tyler Cecil, "Impact of Net Neutrality and the Open Internet Order on Security and Privacy in Education", Proceedings of the 19<sup>th</sup> Colloquium for Information Systems Security, Best Paper Award for 2015, June 15-17, 2015.
4. A.D. Kent and L.M. Liebrock, "Statistical Detection of Malicious Web Sites through Time Proximity to Existing Detection Events", Resilient Control Systems (RSRCS), 2013, pp. 192-197.
5. D. Quist, L. Liebrock, and J. Neil, "Improving Antivirus Accuracy with Hypervisor Assisted Analysis", Journal of Computer Virology, Volume 7, Issue 2, pp 121-131, DOI 10.1007/s11416-010-0142-4, 2011.

6. D. Quist and L.M. Liebrock, "Reversing Compiled Executables for Malware Analysis via Visualization", *Information Visualization*, Eds: J.R. Goodall, G. Conti, and K.-L. Ma, Vol. 5210, pp. 36-43, DOI 10.1057/978-3-540-85933-8, 2011.
7. V. Echeverria, L.M. Liebrock and D. Shin, "Permission Management System: Permission as a Service in Cloud Computing", 2010 34th Annual IEEE Computer Software and Applications Conference Workshops, 2010.
8. M. Schwartz, and L.M. Liebrock, "A Term Distribution Visualization Approach to Digital Forensic String Search", *Lecture Notes in Computer Science*, Eds: J.R. Goodall, G. Conti, and K.-L. Ma, Vol. 5210, pp. 36-43, DOI 10.1007/978-3-540-85933-8\_4, 2008.
9. L.M. Liebrock, "Scholarship for Service", *IEEE Distributed Systems Online*, Education Department, Invited by Editor Maria Ganzha, Vol. 7, No. 9, 2006. One of 50 most popular papers for this publication (as of 6-4-2019).
10. Aishwarya Kalyanasundarm, and Lorie Liebrock, "Vulnerability Scanning for Buffer Overflow", *Proceedings of the International Conference on Information Technology (ITCC 2004)*, Las Vegas, Nevada, 5-7 April 2004.

#### Synergistic Activities

- Patent: "Detecting Anomalous Behavior Via User Authentication Graphs", Alexander Kent, Joshua Neil, Lorie Liebrock, NMT and LANL, US Patent Serial No. 10,015,175, July 3, 2018.
- Patent: "Multiprocessor Parallel Computer Architecture Using a Parallel Machine with Topology-Based Mapping of Composite Grid Applications", L.M. Liebrock, Liebrock-Hicks Research, US Patent Serial No. 5,737,623, 1998.
- Director of New Mexico Cybersecurity Center of Excellence for Economic Development (CCoE) and New Mexico Tech Cybersecurity Education Center (CEC): Dr. Liebrock accepted the position as interim director on July 8, 2019 to lead the development of these centers (established July 1, 2019). Dr. Liebrock wrote the proposals to the state of New Mexico for both centers (the CCoE was initiated by Governor Lujan-Grisham and the CEC was initiated by Drs. Liebrock and Mozley). Both centers have base funding from the state that Dr. Liebrock has been responsible for proposing and is responsible for managing. Dr. Liebrock has established the outreach programs for K12 education and industry. She initiated a cybersecurity student club at NMT, which became the second largest student club on campus in its first semester. She drafted the Transdisciplinary Cybersecurity graduate programs and has worked with faculty across disciplines at NMT and across the state to garner support to offer the classes. She initiated the collaboration with NMSU and UNM to offer the Transdisciplinary Cybersecurity graduate programs jointly. In addition, she is working with Dr. Pontelli at NMSU to move forward on a BS in Cybersecurity at NMT that will collaborate with the BS in Cybersecurity at NMSU. Dr. Liebrock is leading student teams working on security audits such as security and privacy audit for a COVID-19 contact tracing app and full system audits of enterprises including school districts, municipalities, and a medical care provider.
- Cybersecurity Education and Research Activities: Scholarship for Service Principal Investigator, National Science Foundation, 2003-2020. Hands-on experience has been provided to students through research, professional development, and doing security audits and cybersecurity literacy training for NM municipalities. Contacts and placement of students through this program with LANL, INL, SNLA, DISA, NSA, Air Force, Fort Huachuca, Federal Reserve, Army Corp of Engineers, and SPAWAR. This work has increased the number and quality of cybersecurity courses offered and cybersecurity research pursued. Authored/co-authored and published 26 cybersecurity papers. PI or Co-PI on \$5,942,352 in cybersecurity funding with \$6,930,403 total funding.