Marc Liberatore

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Computer Science Building
140 Governors Drive
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Research Interests

CS education, digital forensics, anonymity systems, security, and peer-to-peer architectures.

Academic Experience

University of Massachusetts Amherst, Amherst, MA 01003

Senior Lecturer II **September 2020 – Present**
Senior Lecturer **September 2019 – August 2020**
Lecturer **September 2016 – August 2019**
Associate Director, Digital Forensics Laboratory
Responsibilities include teaching five courses or course equivalents per academic year, course development, supporting the CyberCorps Scholarship for Service (SFS) program, and College and University service.

Research Scientist and Lecturer **November 2008 – August 2016**
Associate Director, Center for Forensics and Society
Research and development of digital forensic science and computer security; occasional teaching. Responsibilities included designing, implementing, and evaluating systems for digital investigations; planning and exploring new lines of research with the goal of advancing forensic science; coordination and writing of grant proposals; occasional teaching; supervision of undergraduate and graduate students; and collaboration with local and remote academic and law enforcement colleagues.

Wesleyan University, Middletown, CT 06459

Visiting Assistant Professor (Mellon Fellow) **August 2007 – December 2008**
Developed and taught an upper-level undergraduate course *Introduction to Network and Computer Security* (COMP360, Fall 2007). Other responsibilities included teaching at Connecticut College (COM325, Spring 2008) and Trinity College (CPSC415, Fall 2008), conducting research, giving seminar talks, and involving undergraduates in research projects.

University of Massachusetts Amherst, Amherst, MA 01003

Research Assistant **January 2001 – August 2007**
Performed Ph.D. research and Masters level coursework and research projects. Responsibilities included constructing and evaluating large software prototypes and implementations, occasional supervision of undergraduates, and collaboration with local and remote colleagues.

Instructor **June – August 2001**
Instructor for the undergraduate course in *Computer Architecture and Assembly Language* (CMPSCI 201, Summer 2001). Responsibilities included lecture, discussion, lab supervision, grading, and development of labs, homework, and exams for a class of 35 students.

Awards

University of Massachusetts Amherst
Distinguished Teaching Award, 2025-26
Delphi Leadership Award, 2025
College Outstanding Teaching Award, 2019

Education

University of Massachusetts Amherst
Ph.D., Computer Science, February 2008
M.S., Computer Science, May 2003
B.S. *cum laude*, Computer Science, May 2000

Teaching

Data Structures (CICS210). Fall 2025. 191 students. Co-taught with Mordecai Golin, who had another section of 157 students. Nominated for a Distinguished Teaching Award.

Data Structures (CICS210). Spring 2024. 142 students. Co-taught with new to UMass instructor Mordecai Golin, who had another section of 131 students. Students gave 4.8 out of 5.0 for "Overall rating of this instructor's teaching."

Data Structures (CICS210). Fall 2023. 190 students. Students gave 4.6 out of 5.0 for "Overall rating of this instructor's teaching."

Data Structures (CICS210). Spring 2023, inaugural offering of new intro CICS curriculum. 38 students. Students gave 4.8 out of 5.0 for "Overall rating of this instructor's teaching."

Computer Systems Principles (COMPSCI230). Fall 2022, 282 students. Students gave 4.7 out of 5.0 for "Overall rating of this instructor's teaching."

Using Data Structures (COMPSCI186). Spring 2022. 61 students. Students gave 4.9 out of 5.0 for "Overall rating of this instructor's teaching."

Advanced Digital Forensics Systems (COMPSCI590K). Spring 2022, fully remote/online class.

CICS Study Skills RAP FYS (13 students) and Computational Thinking for the Complete Novice FFYS (19 students). Fall 2021.

Using Data Structures (COMPSCI186). Spring 2021, in-person despite COVID. 22 students.

Using Data Structures (COMPSCI186). Fall 2020, online-only due to COVID. 48 students, no required evaluations due to COVID.

Advanced Digital Forensics Systems (COMPSCI590K). Spring 2020, hybrid in-person/remote asynchronous. 27 students, no evaluations due to COVID.

Great Ideas in Computer Science (FFYS, CICS191CMPS2). Fall 2019. Two 19 student sections; students gave a 3.6 and a 4.0 out of 4.0 for "overall, how would you rate your learning experience in this course?"

Using Data Structures (COMPSCI186). Fall 2019. 116 students; students gave 4.9 out of 5.0 for "overall rating of the instructor's teaching."

Using Data Structures (COMPSCI186). Spring 2019. 87 students; students gave 4.8 out of 5.0 for "overall rating of the instructor's teaching."

Digital Forensics (COMPSCI365). Spring 2019. 83 students; students gave 4.8 out of 5.0 for "overall rating of the instructor's teaching."

Advanced Digital Forensics (COMPSCI590F). Spring 2019. 22 students; students gave 5.0 out of 5.0 for "overall rating of the instructor's teaching."

Using Data Structures (COMPSCI186). Fall 2018. 128 students; students gave 4.9 out of 5.0 for "overall rating of the instructor's teaching." Nominated for a Distinguished Teaching Award.

Computer Crime Law (COMPSCI391L). Fall 2018. 28 students; students gave 5.0 out of 5.0 for "overall rating of the instructor's teaching."

Fraud Detection (INFOSEC690F). Spring 2018 CPE / UMass Amherst. 9 students; students gave 4.2 out of 5.0 for "Overall rating of the instructor's teaching."

Digital Forensics (COMPSCI365/590F). Spring 2018. 86 undergraduate and 7 graduate students; undergraduate students gave 4.8 out of 5.0 for "Overall rating of the instructor's teaching", graduate students gave 4.7 out of 5.0.

Using Data Structures (COMPSCI190D). Fall 2017. 103 students; students gave 4.9 out of 5.0 for "Overall rating of the instructor's teaching." Finalist for a Distinguished Teaching Award.

Computer Crime Law (COMPSCI391L). Fall 2017. 24 students; students gave 4.7 out of 5.0 for "Overall rating of the instructor's teaching."

Using Data Structures (COMPSCI190D). Spring 2017. 88 students; students gave 4.7 out of 5.0 for "Overall rating of the instructor's teaching."

Digital Forensics (COMPSCI365/590F). Spring 2017. 78 undergraduate and 17 graduate students; undergraduate students gave 4.7 out of 5.0 for "Overall rating of the instructor's teaching", graduate students gave 4.7 out of 5.0.

Using Data Structures (COMPSCI190D). Fall 2016. 89 students; students gave 4.9 out of 5.0 for "Overall rating of the instructor's teaching." Nominated for a Distinguished Teaching Award.

Computer Crime Law (COMPSCI391L/591L). Fall 2016. 24 undergraduate and six graduate students; undergraduate students gave 4.9 out of 5.0 for "Overall rating of the instructor's teaching", graduate students gave 5.0 out of 5.0.

A Networked World (COMPSCI290NW). Spring 2016. 45 students; students gave 4.3 out of 5.0 for "Overall rating of the instructor's teaching."

Programming with Data Structures (CMPSCI187). Spring 2015. 112 students; students gave 4.6 out of 5.0 for "Overall rating of the instructor's teaching." Nominated for a Distinguished Teaching Award.

Artificial Intelligence (CMPSCI383). Fall 2014. 44 students; students gave 4.5 out of 5.0 for "Overall rating of the instructor's teaching."

A Networked World (CMPSCI290NW). Fall 2014. 37 students; students gave 4.8 out of 5.0 for "Overall rating of the instructor's teaching."

Computer Networks (CMPSCI453). Spring 2014. 46 students; students gave 4.8 out of 5.0 for "Overall rating of the instructor's teaching."

Computer Crime Law (CMPSCI391LI), with Brian Levine. Fall 2011 at UMass Amherst. 25 students. (Quantitative evaluations for Prof. Levine only.)

Introduction to Network and Computer Security (CPSC415). Fall 2008 at Trinity College (Hartford, CT).

Introduction to Network and Computer Security (COM325). Spring 2008 at Connecticut College (New London, CT).

Introduction to Network and Computer Security (COMP360). Fall 2007 at Wesleyan University (Middletown, CT).

Architecture and Assembly Language (CMPSCI201). Summer 2001. 35 students; students gave 4.4 out of 5.0 for "Overall rating of the instructor's teaching."

Departmental / College / University Service

AY24–25: CICS Intro Sequence Committee (chair), Faculty Activity Reporting Project, University Academic Honesty Board, Faculty Senator, Faculty Senate Academic Matters Council, Academic Matters Council Policy Subcommittee, Academic Matters Calendar Subcommittee, MSP Co-President, MSP Bargaining Team, MTA/BHE Health and Welfare Trust Fund Co-Chair

AY23–24: CICS Intro Sequence Committee (chair), Senate Joint Task Force on Generative AI (education subcommittee), University Academic Honesty Board, Faculty Senator, Faculty Senate Academic Matters Council, Academic Matters Council Policy Subcommittee, Academic Matters Calendar Subcommittee, MSP Co-President, MSP Bargaining Team, MTA/BHE Health and Welfare Trust Fund Co-Chair

AY22–23: Department Personnel Committee (Promotion and Tenure co-chair), CICS Hiring Committee (Programming Languages), University Academic Honesty Board, Faculty Senator, Faculty Senate Academic Matters Council, Academic Matters Council Policy Subcommittee, Academic Matters Calendar Subcommittee, MSP Co-President, MSP Bargaining Team

AY21–22: Department Personnel Committee (AFR subcommittee), Undergraduate Curriculum Revisions Committee (as needed), University Academic Honesty Board, Faculty Senate Academic Matters Council, Academic Matters Council Policy Subcommittee, Academic Matters Calendar Subcommittee, Provost's AFR/ALR Revision Committee, MSP Co-President, MSP Bargaining Team

AY20–21: Department Personnel Committee (Promotion and Tenure subcommittee), Undergraduate Curriculum Committee (as needed), University Academic Honesty Board, Faculty Senate Academic Matters Council, Academic Matters Council Policy Subcommittee, Provost's AFR/ALR Revision Committee, MSP Vice President, MSP Bargaining Team, MSP Faculty Advocate

AY19–20: Ad Hoc Committee on the Undergraduate Curriculum (chair), University Academic Honesty Board, MSP Executive Board, MSP Bargaining Team, MSP Faculty Advocate

AY18–19: Computer Science Undergraduate Program Committee, CICS PC (AFR subcommittee), CICS Executive and Budget Committee, University Academic Honesty Board, MSP Executive Board, MSP Faculty Advocate

AY17–18: Computer Science Undergraduate Program Committee, CICS PC (AFR subcommittee), CICS Task Force on Learning Outcomes, University Academic Honesty Board, MSP Executive Board, MSP Faculty Advocate, CICS Summer Transfer Advising (Su18), CICS Summer NSO (Su18)

AY16–17: Computer Science Undergraduate Program Committee, CICS Lecturer Recruiting Committee, University Academic Honesty Board, CICS Winter Transfer Advising, CICS Summer Transfer Advising (Su17), CICS Summer NSO (Su17)

Peer-Reviewed Publications

Statistical Detection of Downloaders and Uploaders in Freenet Brian Neil Levine, Marc Liberatore, Brian Lynn, and Matthew Wright. Proc. ACM Conference on Computer & Communications Security (CCS), November 2020.

Server-side traffic analysis reveals mobile location information over the Internet. Keen Sung, Joydeep Biswas, Erik Learned-Miller, Brian Neil Levine, and Marc Liberatore. ACM Transactions on Mobile Computing, June 2019.

Forensic Identification of Anonymous Sources in OneSwarm. George Bissias, Brian Neil Levine, Marc Liberatore, and Swagatika Prusty. IEEE Transactions on Dependable and Secure Computing, November 2017.

Statistical Detection of Downloaders in Freenet. Brian Neil Levine, Marc Liberatore, Brian Lynn, and Matthew Wright. Proceedings of the Third IEEE International Workshop on Privacy Engineering, pages 25–32, May 2017.

Characterization of Contact Offenders and Child Exploitation Material Trafficking on Five Peer-to-Peer Networks. George Bissias, Brian Neil Levine, Marc Liberatore, Brian Lynn, Juston Moore, Hanna Wallach, and Janis Wolak. Elsevier Child Abuse & Neglect, 52:185–199, 2016.

Discovering Specification Violations in Networked Software Systems. Robert J. Walls, Yuriy Brun, Marc Liberatore, and Brian Neil Levine. Proceedings of the IEEE International Symposium on Software Reliability Engineering, November 2015.

Sybil-Resistant Mixing for Bitcoin. George Bissias, A. Pinar Ozisik, Brian N. Levine, and Marc Liberatore. In Proceedings of the ACM Workshop on Privacy in the Electronic Society, November 2014.

Efficient Tagging of Remote Peers During Child Pornography Investigations. Marc Liberatore, Brian Neil Levine, Clay Shields, and Brian Lynn. IEEE Transactions on Dependable and Secure Computing, 11(5):425–439, September 2014.

Location privacy without carrier cooperation. Keen Sung, Brian Neil Levine, and Marc Liberatore. Proceedings of the IEEE Workshop on Mobile System Technologies (MoST), May 2014.

Measuring a year of child pornography trafficking by U.S. computers on a peer-to-peer network. Janis Wolak, Marc Liberatore, and Brian Neil Levine. Child Abuse & Neglect, page 10, 2013.

Disabling GPS is Not Enough: Cellular location leaks over the Internet. Hamed Soroush, Keen Sung, Erik Learned-Miller, Brian Neil Levine, and Marc Liberatore. Proceedings of the Privacy Enhancing Technologies Symposium (PETS), pages 103–122, July 2013.

Measurement and Analysis of Child Pornography Trafficking on P2P Networks. Ryan Hurley, Swagatika Prusty, Hamed Soroush, Robert J. Walls, Jeannie Albrecht, Emmanuel Cecchet, Brian Neil Levine, Marc Liberatore, and Brian Lynn. Proceedings of the International World Wide Web Conference (WWW), May 2013. Runner-Up for Best Paper.

Effectiveness and Detection of Denial-of-Service Attacks in Tor. Norman Danner, Sam Defabbia-Kane, Danny Krizanc, and Marc Liberatore. ACM Transactions on Information and System Security (TISSEC), 15(3):11:1–11:25, November 2012.

Forensic Investigation of the OneSwarm Anonymous Filesharing System. Swagatika Prusty, Brian Neil Levine, and Marc Liberatore. Proceedings of the ACM Conference on Computer and Communications Security (CCS), 13 pages, October 2011.

Effective Digital Forensics Research is Investigator-Centric. Robert J. Walls, Brian Neil Levine, Marc Liberatore, and Clay Shields. Proceedings of the USENIX Workshop on Hot Topics in Security, 7 pages, August 2011.

Empirical Tests of Anonymous Voice Over IP. Marc Liberatore, Bikas Gurung, Brian Neil Levine, and Matthew Wright. Elsevier Journal of Network and Computer Applications, 34(1):341-350, January 2011.

Strengthening Forensic Investigations of Child Pornography on P2P Networks. Marc Liberatore, Brian Neil Levine, and Clay Shields. Proceedings of the ACM Conference on Future Networking Technologies (CoNEXT), 12 pages, November 2010.

Forensic Investigation of Peer-to-Peer File Sharing Networks. Marc Liberatore, Robert Erdely, Thomas Kerle, Brian Neil Levine, and Clay Shields. Proceedings of the DFRWS Annual Digital Forensics Research Conference, pages 95–103, August 2010.

DEX: Digital Evidence Provenance Supporting Reproducibility and Comparison. Brian Neil Levine and Marc Liberatore. Proceedings of the DFRWS Annual Digital Forensics Research Conference, pages 48–56, August 2009.

Detecting Denial of Service Attacks in Tor. Norman Danner, Danny Krizanc, and Marc Liberatore. Proceedings of the Thirteenth International Conference on Financial Cryptography and Data Security, pages 273–284, February 2009.

Cheat-Proof Playout for Centralized and Peer-to-Peer Gaming. Nathaniel E. Baughman, Marc Liberatore, and Brian Neil Levine. IEEE/ACM Transactions on Networking, 15(1):1–13, February 2007.

Maximizing Transfer Opportunities in Bluetooth DTNs. Marc Liberatore, Brian Neil Levine, and Chadi Barakat. Proceedings of the ACM Conference on Future Networking Technologies (CoNext), 11 pages, December 2006.

Inferring the Source of Encrypted HTTP Connections. Marc Liberatore and Brian Neil Levine. Proceedings of the ACM Conference on Computer and Communications Security (CCS), pages 255–263, October 2006.

Privacy Vulnerabilities in Encrypted HTTP Streams. George Bissias, Marc Liberatore, David Jensen, and Brian Neil Levine. Proceedings of the Privacy Enhancing Technologies Workshop (PET), pages 1–11, May 2005.

Funding

PI: Brian Levine, Co-PIs: Wayne Burleson, Marc Liberatore, Daniel Holcomb, "CyberCorps Scholarship for Service (Renewal): Cross Disciplinary Cybersecurity Education for a Modern Workforce," $4.4M over five years starting July 2021. National Science Foundation (DGE-2043084).

PI: Brian Levine, Co-PIs: Wayne Burleson, Marc Liberatore, Mila Sherman, Eric Sommers. "CyberCorps Scholarship for Service at the University of Massachusetts Amherst," $4.2M over five years, ending May 2021. National Science Foundation (DGE-1565521).

PI: Brian Levine, Co-PI: Marc Liberatore. "Research and Development for IINIU," $160k over one year, ending December 2013. Department of Justice.

PI: Marc Liberatore, Co-PIs: Brian Levine, Hanna Wallach. "RoundUp Predictive Tools," $475k over three years, ending September 2014. $618k with partners Janis Wolak (UNH Crimes Against Children Research Center) and Brad Russ (Fox Valley). Office of Juvenile Justice and Delinquency Prevention (OJJDP).

PI: Marc Liberatore, Co-PI: Brian Levine. "Novel Investigative Techniques for Internet Crimes against Children Task Forces," $150k over eighteen months, ending March 2012. OJJDP, subcontract from MA Department of State Police (MSP).

PI: Thomas Kerle (MSP), Co-PIs: Marc Liberatore (PI for UMass), Brian Levine, Janis Wolak (UNH), Brad Russ (FV). "Needs Assessment and Developmental Activities for the National Internet Crimes Against Children Data System (NIDS)," OJJDP, October 2010.

PI: Brian Levine. Co-PI: Marc Liberatore, "Strengthening Forensic Science for Network Investigations," $380k over three years, ending July 2013. $500k with partner Janis Wolak (UNH), National Science Foundation. (CNS-1018615)

PI: Brian Levine, Co-PI: Marc Liberatore. "RoundUp: A System for Identifying and Gathering Evidence of P2P Trafficking," $740k over four years, ending August 2012. National Institute of Justice. Sept. 2008. (2008-CE-CX-K005)

Outreach and Talks

UMass Turing Summer Program, a free three-week for rising high school sophomores and juniors interested in learning more about computer science. Ran one day-long program covering security topics. 2022–2025.

Panel presentation, "Innovation with scale: turning large class sizes into opportunities for pedagogical innovation." Consortium for Computing Sciences in Colleges — Northeastern Region. College of St. Rose, Albany, NY. April 2017.

Invited talks, "Internet Investigations and Anonymity: A Practical Overview" and "Understanding the BitTorrent File Sharing Network." National Law Enforcement Training on Child Exploitation, Atlanta, GA. May 2012.

Invited talk, "Understanding Internet Anonymity Systems." 6th Annual Provincial Strategy Multidisciplinary Training Conference, Ontario, Canada. November 2011.

Invited talks, "Internet Anonymity: A Practical Overview" and "Understanding BitTorrent." National Strategy Conference on Combating Child Exploitation, San Jose, CA. May 2011.

Invited talk, "Internet Anonymity." High Technology Crime Investigation Association (Northeast Chapter), Boston, MA. September 2010.

Invited talk (with Brian Levine), "Understanding BitTorrent." Internet Crimes Against Children National Conference, Jacksonville, FL. May 2010.

Advising

10 third- and fourth-year CS majors in AY 20–21.

About 15 third- and fourth-year CS majors in AY 19–20.

Approximately 200 first- and second-year CS majors each year from AY16–17 to AY18–19.

Ryan Hurley, M.S. May 2013, took a position at TripAdvisor. Co-advisor.

Swagatika Prusty, M.S. May 2012, took a position in the kernel group at Oracle. Co-advisor.

Sharon Santana, Research Experience for Undergraduates (visiting from Greenfield Community College, MA; matriculated at Smith College in 2012), Summer 2011. Advisor.

LaTia Jefferson, Research Experience for Undergraduates (visiting from McKendree University, IL), Summer 2011. Advisor.

Craig Darmetko, B.S. May 2010. Reader for honors thesis.

Professional Service

Served on the technical program committee for the 2011–15 DFRWS Digital Forensics Conference, 2013–15 Privacy Enhancing Technologies Symposium (PETS), the ACM CCS Workshop on Insider Threats (WITs 2010) and the Workshop on Network and Systems Support for Games (NetGames 2008).

Ad hoc reviewing for various journals and conferences, including IEEE Transactions on Parallel and Distributed Systems (TPDS), IEEE/ACM Transactions on Networking (TON), Springer Journal of Multimedia Tools and Applications, ACM Computer Communication Review (CCR), Springer/ACM Multimedia Systems Journal, ACM Transactions on Modeling and Performance Evaluation of Computer Systems, Network and Distributed System Security Symposium (NDSS), ACM Conference on Computer and Communications Security (CCS), USENIX Security Symposium, IEEE Conference on Computer Communications (INFOCOM), Conference on Privacy Enhancing Technologies (PET), Northeast Digital Forensics Exchange (NeFX), and the ACM Conference on Network and Operating System Support for Digital Audio and Video (NOSSDAV).

Software

RoundUp (`http://forensics.umass.edu`); a suite of tools for forensic investigation of contraband sharing on peer-to-peer networks. The tools are used by State Police in all 50 U.S. states, several federal agencies, in other countries, and as part of the standard curriculum of the Internet Crimes Against Children Task Force when training law enforcement in p2p investigations. Since the project's start in September 2008, over 9,000 investigators have completed multi-day trainings to become certified with our suite of software tools, and the tools have been the basis of at least 12,000 investigator-led criminal arrests. Collaborative work with Brian Levine, Brian Lynn, and Clay Shields.

Industrial Research Experience

Intel Research Cambridge, England

Research Intern **May – October 2004**

Performed various research duties relating to disruption tolerant networking, including design of prototype Delay Tolerant Network (DTN) protocols, implementation of DTN software for deployment on embedded Java platforms, and measurement studies of several Bluetooth implementations.

Other Service

Amherst Fire Department, Amherst, MA 01002

Call Fire Lieutenant **July 2001 – August 2007**

Served as an officer for Engine Company 4, which staffed the ladder truck, an engine, and an ambulance for the Town of Amherst. Responsibilities included leadership and supervision, fire suppression, emergency medical care, developing and overseeing training exercises, and various administrative tasks. No, dear reader, I am never taking this off my C.V. Someday, when my kids are older, I will once again be able to put the wet stuff on the red stuff!