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# Michael L. Nelson

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## Career Highlights

- Director:** Web Science & Digital Library (WSDL) Research Group, **blog:** [ws-dl.blogspot.com](http://ws-dl.blogspot.com), **GitHub:** [github.com/oduwsdl](https://github.com/oduwsdl), **Twitter:** [twitter.com/WebSciDL](https://twitter.com/WebSciDL)
- PhD Students:** 8 graduated, 10 current (advising and co-advising)
- Grants:** 27 Grants (PI on 18), \$9.4M in total funding, including an NSF CAREER award
- Publications:** 240+ publications, 5200+ citations, h=33, [scholar.google.com/citations?user=oWQaPnwAAAAJ](https://scholar.google.com/citations?user=oWQaPnwAAAAJ)
- Protocols:** Co-editor of four popular protocols: Memento (Internet RFC 7089), ResourceSync (ANSI/NISO Z39.99-2014), OAI-ORE, and OAI-PMH
- Awards:** 3 best paper awards (+3 nominations), 4 best poster awards, Digital Preservation Award (2010)
- Popular Media:** including CNN, The New Yorker, The Atlantic, The Washington Post, MIT Technology Review, The Chronicle of Higher Education, WHRO, BBC, and Der Spiegel

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## Professional Preparation

- 2000–2001 **Postdoctoral**, *University of North Carolina, School of Information and Library Science*, Chapel Hill, NC, Advisor: Gary Marchionini.
- 2000 **Ph.D. Computer Science**, *Old Dominion University*, Norfolk, VA, Advisor: Kurt Maly.  
Dissertation Title: *Buckets: Smart Objects for Digital Libraries*
- 1997 **M.S. Computer Science**, *Old Dominion University*, Norfolk, VA.
- 1991 **B.S. Computer Science**, *Virginia Tech*, Blacksburg, VA.

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## Appointments

- 2015–present **Professor**, *Old Dominion University*, Norfolk, VA.
- 2008–2015 **Associate Professor**, *Old Dominion University*, Norfolk, VA.
- 2002–2008 **Assistant Professor**, *Old Dominion University*, Norfolk, VA.
- 1991–2002 **Computer Engineer**, *NASA Langley Research Center*, Hampton, VA.
- 2002 **Consultant**, *Institute for Computer Applications in Science and Engineering (ICASE)*, Hampton, VA.
- 2000 **Summer Visiting Researcher**, *Air Force Research Laboratory*, Albuquerque, NM.
- 1999 **Summer Visiting Researcher**, *Air Force Research Laboratory*, Albuquerque, NM.
- 1995–1996 **Principal**, *Unified Research Laboratories*, Hampton, VA.
- 1991 **Systems Programmer**, *Computer Sciences Corporation*, Hampton, VA.

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## Awards and Recognition

- 2017 **Best Poster**, *ACM/IEEE JCDL 2017*.
- 2015 **Best Student Paper Award (Lulwah Alkawai)**, *ACM/IEEE JCDL 2015*.
- 2015 **Best Poster**, *ACM/IEEE JCDL 2015*.
- 2014 **Vannevar Bush Best Paper Award**, *ACM/IEEE JCDL 2014*.
- 2014 **Best Student Paper Award (Justin Brunelle)**, *ACM/IEEE JCDL 2014*.
- 2013 **Best Student Paper Award (Yasmin AlNoamany)**, *TPDL 2013*.
- 2013 **Best Student Paper Finalist (Scott Ainsworth)**, *ACM/IEEE JCDL 2013*.
- 2012 **ODU College of Science Distinguished Research Award**.

- 2012 **ODU College of Science Doctoral Mentoring Award.**
- 2010 **Digital Preservation Coalition (DPC) Digital Preservation Award, *For Work on Memento*, London UK, December 1 2010.**
- 2010 **Microsoft Research Faculty Summit 2010, *For Work on Memento*, Redmond WA, July 12-13 2010.**
- 2010 **O'Reilly Foo Camp, *For Work on Memento*, Sebastopol CA, June 24-28 2010.**
- 2008 **Digital Preservation Pioneer, *Library of Congress*.**
- 2007–2011 **NSF CAREER Award, *Self-Preserving Digital Objects*.**
- 2007 **Invited Participant, *NSF/JISC Repositories Workshop*, April 17-19, 2007, Phoenix AZ.**
- 2004 **Best Poster, *ACM/IEEE JCDL 2004*.**
- 2003 **Vannevar Bush Best Paper Finalist, *ACM/IEEE JCDL 2003*.**
- 2001 **Award for the NACA digital library, *NASA Langley Research Center*.**
- 2000–2001 **Information Technology Fellowship, *NASA Langley Research Center*.**
- 2000 **Award for Research Excellence, *NASA Langley Research Center*.**
- 1996 **Best Technical Site for the NASA Technical Report Server, *Industry.Net*.**
- 1994 **Team Excellence Award for Internet Fair 1, *NASA Langley Research Center*.**
- 1993 **Award for the Langley Technical Report Server, *NASA Langley Research Center*.**

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## Grants (\$9.1M total, PI on 18 of 27)

- 2018–2019 Z. Xie (PI), E. Fox, M. Klein, M. L. Nelson, J. Littman, J. Bailey, I. Milligan, "Continuing Education to Advance Web Archiving", IMLS, \$248,451 (ODU portion is \$20,000)
- 2017–2019 M. C. Weigle (PI), M. L. Nelson, "Visualizing Webpage Changes Over Time", NEH, \$75,000
- 2016–2019 M. L. Nelson (PI), M. C. Weigle, H. Van de Sompel, "Towards a Web-Centric Approach for Capturing the Scholarly Record", Andrew Mellon Foundation, \$830,000
- 2015–2018 M. L. Nelson (PI), M. C. Weigle, "Increasing the Value of Existing Web Archives", NSF, \$481,780
- 2015–2018 M. L. Nelson (PI), M. C. Weigle, "Combining Social Media Storytelling With Web Archives", IMLS, \$468,618
- 2014–2017 M. C. Weigle (PI), M. L. Nelson, "Archive What I Can See Now: Bringing Institutional Web Archiving Tools to the Individual Researcher", NEH, \$324,624
- 2014–2016 M. L. Nelson, "Web Archive Profiling Via Sampling", IIPC, \$49,000
- 2014 M. L. Nelson (PI), M. C. Weigle, "Tools for Managing Seed URIs", Andrew Mellon Foundation, \$22,000
- 2014 M. C. Weigle (PI), M. L. Nelson, "Visualizing Digital Collections of Web Archives", Andrew Mellon Foundation, \$22,000
- 2013–2014 M. C. Weigle (PI), M. L. Nelson, "Archive What I Can See Now", NEH, \$57,892
- 2013–2014 M. L. Nelson, "Enhanced Memento Support for MediaWiki", Andrew Mellon Foundation, \$25,000
- 2012–2013 M. L. Nelson, "Doctoral Consortium at 2012 ACM/IEEE-CS Joint Conference on Digital Libraries (JCDL 2012)", NSF, \$15,930
- 2012–2013 T. A. Carpenter (PI), M. L. Nelson, C. Lagoze, "A Specification for Resource Synchronization", Alfred P. Sloan Foundation, \$222,706 (ODU portion is \$28,260)
- 2011 M. L. Nelson (PI), M. C. Weigle, K. Gossett, L. Potts, "Identifying and Archiving Culturally Important Conversations in the Social Web", ODU Research Foundation, \$54,000
- 2010–2013 H. Garcia-Molina (PI), M. L. Nelson, F. McCown, "III: Large: Collaborative Research: Web Archive Cooperative", NSF, \$2,858,601 (ODU portion is \$399,754)
- 2010–2012 M. L. Nelson (PI), H. Van de Sompel, "Integrating the Past Web Into the Current Web", Library of Congress, \$1,000,000 (ODU portion is \$450,000)
- 2008 M. L. Nelson, "Client-Side Preservation Techniques for ORE Aggregations", Andrew Mellon Foundation, \$24,500
- 2007–2011 M. L. Nelson, "CAREER: Self-Preserving Digital Objects", NSF, \$540,754
- 2007–2010 M. L. Nelson (PI), H. Van de Sompel, "Tools for a Preservation-Ready Web", Library of Congress, \$249,941
- 2006–2007 M. L. Nelson, "SGER: In Vivo Digital Preservation", NSF, \$101,895
- 2006 M. L. Nelson, "Repository Design and Support for the Library of Congress", Library of Congress, \$16,156
- 2005–2006 M. L. Nelson, "OAI-PMH Repository Analysis for the NASA Langley Research Center Atmospheric Sciences Data Center", NASA LaRC, \$50,892
- 2005–2006 M. L. Nelson (PI), J. Bollen, "Shared Infrastructure Preservation Models", NSF, \$111,300
- 2004–2005 M. L. Nelson (PI), J. Bollen, "Self-Preserving Digital Objects", Library of Congress, \$109,836
- 2004–2005 M. L. Nelson, "mod\_oai: Getting OAI for Free", Andrew Mellon Foundation, \$47,433
- 2003–2004 K. Maly (PI), M. Zubair, M. L. Nelson, J. Bollen, "Digital Library Technology/Application Development", NASA LaRC, \$240,000
- 2002–2004 K. Maly (PI), M. Zubair, M. L. Nelson, "Kepler – A Communal Digital Library", NSF, \$700,000
- 2001–2002 K. Maly (PI), M. Zubair, M. L. Nelson, "An OAI-Compliant Federated Physics Digital Library for the NSDL", NSF, \$479,997

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## Protocols and Specifications

- [1] Martin Klein, Robert Sanderson, Robert Van de Sompel, Herbert, Simeon Warner, Bernhard Haslhofer, Michael Nelson, and Carl Lagoze. ResourceSync Framework Specification (ANSI/NISO Z39.99-2014). <http://www.openarchives.org/rs/resourcesync>, 2014.
- [2] Herbert Van de Sompel, Michael Nelson, and Robert Sanderson. HTTP framework for time-based access to resource states – Memento, Internet RFC 7089, December 2013.
- [3] Carl Lagoze, Herbert Van de Sompel, Pete Johnston, Michael Nelson, Robert Sanderson, and Simeon Warner. ORE Specifications and User Guides, 2008.
- [4] Carl Lagoze, Herbert Van de Sompel, Michael L. Nelson, and Simeon Warner. The Open Archives Initiative Protocol for Metadata Harvesting. <http://www.openarchives.org/OAI/openarchivesprotocol.html>, 2002.

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## Proceedings Edited

- [1] José Borbinha, Michael L. Nelson, and Steve Knight, editors. *Proceedings of the 10th International Conference on Preservation of Digital Objects iPRES 2013, Lisbon, Portugal, September 3-5, 2013*, 2013.
- [2] Karim B. Boughida, Barrie Howard, Michael L. Nelson, Herbert Van de Sompel, and Ingeborg Sølberg, editors. *Proceedings of the 12th ACM/IEEE-CS Joint Conference on Digital Libraries, JCDL '12, Washington, DC, USA, June 10-14, 2012*. ACM, 2012.
- [3] Gary Marchionini, Michael L. Nelson, and Catherine C. Marshall, editors. *ACM/IEEE Joint Conference on Digital Libraries, JCDL 2006, Chapel Hill, NC, USA, June 11-15, 2006, Proceedings*. ACM, 2006.
- [4] Michael L. Nelson, Kurt Maly, Mohammad Zubair, and Diann Rucsh-Feja, editors. *Experimental OAI-Based Digital Library Systems, Workshop at the 2001 European Conference on Digital Libraries (ECDL), Darmstadt Germany, September 8, 2001*. NASA (NASA/TM-2002-211638), 2002.

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## Book Chapters

- [1] Michael L. Nelson, Carl Lagoze, Herbert Van de Sompel, Pete Johnston, Robert Sanderson, and Simeon Warner. Object Reuse and Exchange. In *Wireless Communication and Information – Radio Engineering and Multimedia Applications*, pages 259–265. Verlag Werner Hulsbusch, 2009.
- [2] Martin Klein, Frank McCown, Joan A. Smith, and Michael L. Nelson. How much preservation do I get if I do absolutely nothing? Using the Web Infrastructure for digital preservation. In *Content Engineering: Konzepte, Technologien und Anwendungen in der Medienproduktion*, pages 71–87. Gito Verlag, 2007.
- [3] Frank McCown, Joan A. Smith, Michael L. Nelson, and Johan Bollen. Reconstructing websites for the lazy webmaster. In *Dynamics of Search Engines: An Introduction*, pages 81–112. The Icfai University Press, 2007.
- [4] Gretchen L. Gottlich, John M. Meyer, Michael L. Nelson, and David J. Bianco. Integrating information technology into large organizations. In *Cases in Information Technology Management in Modern Organizations*, pages 210–225. Idea Group Inc., 1997.

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## Refereed Journals

- [1] Shawn M. Jones, Herbert Van de Sompel, and Michael L. Nelson. Avoiding spoilers: wiki time travel with Sheldon Cooper. *International Journal on Digital Libraries*, 19(1):77–93, 2018.

- [2] Lulwah Alkwai, Michael L. Nelson, and Michele C. Weigle. Comparing the archival rate of Arabic, English, Danish, and Korean language web pages. *ACM Transactions on Information Systems*, 36(1), 2017.
- [3] Sawood Alam, Michael L. Nelson, Herbert Van de Sompel, Lyudmila L. Balakireva, Harihar Shankar, and David S. H. Rosenthal. Web archive profiling through CDX summarization. *International Journal on Digital Libraries*, 17(3):223–228, 2016.
- [4] Yasmin AlNoamany, Michele C. Weigle, and Michael L. Nelson. Characteristics of social media stories: What makes a good story? *International Journal on Digital Libraries*, 17(3):239–256, 2016.
- [5] Yasmin AlNoamany, Michele C. Weigle, and Michael L. Nelson. Detecting off-topic pages within TimeMaps in Web archives. *International Journal on Digital Libraries*, 17(3):203–221, 2016.
- [6] Justin F. Brunelle, Mat Kelly, Hany SalahEldeen, Michele C. Weigle, and Michael L. Nelson. Not all mementos are created equal: measuring the impact of missing resources. *International Journal on Digital Libraries*, 16(3-4):283–301, 2015.
- [7] Charles L. Cartledge and Michael L. Nelson. When should I make preservation copies of myself? - and after I do, how will I send messages to my copies? *International Journal on Digital Libraries*, 16(3-4):183–205, 2015.
- [8] Justin F. Brunelle, Mat Kelly, Michele C. Weigle, and Michael L. Nelson. The impact of JavaScript on archivability. *International Journal on Digital Libraries*, 17(2):95–117, 2016.
- [9] Scott G. Ainsworth and Michael L. Nelson. Evaluating sliding and sticky target policies by measuring temporal drift in acyclic walks through a web archive. *International Journal on Digital Libraries*, 16(2):129–144, 2015.
- [10] Ahmed AlSum, Michele C. Weigle, Michael L. Nelson, and Herbert Van de Sompel. Profiling web archive coverage for top-level domain and content language. *International Journal on Digital Libraries*, 14(3):149–166, 2014.
- [11] Yasmin AlNoamany, Ahmed AlSum, Michele C. Weigle, and Michael L. Nelson. Who and what links to the Internet Archive. *International Journal on Digital Libraries*, 14(3):101–115, 2014.
- [12] Martin Klein and Michael L. Nelson. Moved but not gone: an evaluation of real-time methods for discovering replacement web pages. *International Journal on Digital Libraries*, 14(1-2):17–38, 2014.
- [13] Carl Lagoze, Michael L. Nelson, Herbert Van de Sompel, Simeon Warner, Robert Sanderson, and Pete Johnston. A Web-Based Resource Model for Scholarship 2.0: Object Reuse & Exchange. *Concurrency and Computation: Practice and Experience*, 24(18):2221–2240, 2012.
- [14] Frank McCown, Catherine C. Marshall, and Michael L. Nelson. Why websites are lost (and how they're sometimes found). *Communications of the ACM*, 52(11):141–145, 2009.
- [15] Michael L. Nelson, Frank McCown, Joan A. Smith, and Martin Klein. Using the web infrastructure to preserve web pages. *International Journal on Digital Libraries*, 6(4):327–349, 2007.
- [16] Johan Bollen, Michael L. Nelson, Gary Geisler, and Raquel Araujo. Usage derived recommendations for a video digital library. *Journal of Network and Computer Applications*, 30(3):1059–1083, 2007.
- [17] Frank McCown, Xiaoming Liu, Michael L. Nelson, and Mohammad Zubair. Search engine coverage of the OAI-PMH corpus. *IEEE Internet Computing*, 10(2):66–73, 2006.
- [18] Michael L. Nelson and Herbert Van de Sompel. IJDL special issue on complex digital objects: Guest editors' introduction. *International Journal on Digital Libraries*, 6(2):113–114, 2006.
- [19] Xiaoming Liu, Johan Bollen, Michael L. Nelson, and Hebert Van de Sompel. Co-authorship networks in the digital library research community. *Information Processing and Management*, 41(6):1462–1480, 2005.

- [20] Xiaoming Liu, Kurt Maly, Michael L. Nelson, and Mohammad Zubair. Lessons Learned with Arc, an OAI-PMH Service Provider. *Library Trends*, 53(4):590–603, 2005.
- [21] Michael L. Nelson, JoAnne R. Calhoun, and Terry L. Harrison. OAI and NASA scientific and technical information. *Library Hi-Tech*, 21(2):140–150, 2003.
- [22] Xiaoming Liu, Kurt Maly, Mohammad Zubair, Qiaoling Hong, Michael L. Nelson, Frances Knudson, and Irma Holtkamp. Federated Searching Interface Techniques for Heterogeneous OAI Repositories. *Journal of Digital Information*, 2(4), 2002.
- [23] Michael L. Nelson and Kurt Maly. Buckets: smart objects for digital libraries. *Communications of the ACM*, 44(5):60–62, 2001.
- [24] Michael L. Nelson. Buckets A new digital library technology for preserving NASA research. *Journal of Government Information*, 28(4):369–394, 2001.
- [25] Michael L. Nelson. Better interoperability through the Open Archives Initiative. *New Review of Information Networking*, 7:133–146, 2001.
- [26] Nancy R. Kaplan and Michael L. Nelson. Determining the publication impact of a digital library. *Journal of the American Society for Information Science*, 51(4):324–339, 2000.
- [27] Michael L. Nelson and Kurt Maly. Preserving the pyramid of STI using buckets. *International Journal on Grey Literature*, 1(4):174–178, 2000.
- [28] Sandra L. Esler and Michael L. Nelson. Evolution of scientific and technical information distribution. *Journal of the American Society for Information Science*, 49(1):82–91, 1998.
- [29] Sandra L. Esler and Michael L. Nelson. NASA indexing benchmarks: evaluating text search engines. *Journal of Network and Computer Applications*, 20(4):339–353, 1997.
- [30] Sandra L. Esler and Michael L. Nelson. TRSkit: A Simple Digital Library Toolkit. *Journal of Internet Cataloging*, 1(2):41–55, 1997.
- [31] Michael L. Nelson and Ming-Hokng Maa. Optimizing the NASA Technical Report Server. *Internet Research: Electronic Network Applications and Policy*, 6(1):64–70, 1996.
- [32] Michael L. Nelson, Gretchen L. Gottlich, David J. Bianco, Sharon S. Paulson, Robert L. Binkley, Yvonne D. Kellogg, Chris J. Beaumont, Robert B. Schmunk, Michael J. Kurtz, Alberto Accomazzi, and Omar Syed. The NASA technical report server. *Internet Research: Electronic Network Applications and Policy*, 5(2):25–36, 1995.

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## Refereed Conferences and Workshops

- [1] Alexander C. Nwala, Michele C. Weigle, and Michael L. Nelson. Bootstrapping web archive collections from social media. In *Proceedings of ACM Hypertext*, pages 64–72, 2018.
- [2] Grant Atkins, Alexander C. Nwala, Michele C. Weigle, and Michael L. Nelson. Measuring news similarity across ten U.S. news sites. In *Proceedings of iPres*, 2018.
- [3] Shawn M. Jones, Michele C. Weigle, and Michael L. Nelson. The off-topic Memento toolkit. In *Proceedings of iPres*, 2018.
- [4] Shawn M. Jones, Alexander C. Nwala, Michele C. Weigle, and Michael L. Nelson. The many shapes of Archive-It. In *Proceedings of iPres*, 2018.
- [5] Alexander C. Nwala, Michele C. Weigle, and Michael L. Nelson. Scraping SERPs for archival seeds: It matters when you start. In *JCDL '18: Proceedings of the 17th ACM/IEEE-CS Joint Conference on Digital Libraries*, pages 263–272, 2018.
- [6] Mat Kelly, Michael L. Nelson, and Michele C. Weigle. A framework for aggregating private and public web archives. In *JCDL '18: Proceedings of the 17th ACM/IEEE-CS Joint Conference on Digital Libraries*, pages 273–282, 2018.

- [7] Mohamed Aturban, Mat Kelly, Sawood Alam, John A. Berlin, Michael L. Nelson, and Michele C. Weigle. ArchiveNow: Simplified, extensible, multi-archive preservation. In *JCDL '18: Proceedings of the 17th ACM/IEEE-CS Joint Conference on Digital Libraries*, pages 321–322, 2018.
- [8] Sawood Alam, Mat Kelly, Michele C. Weigle, and Michael L. Nelson. Unobtrusive and extensible archival replay banners using custom elements. In *JCDL '18: Proceedings of the 18th ACM/IEEE-CS Joint Conference on Digital Libraries*, pages 319–320, 2018.
- [9] Yasmin AlNoamany, Michele C. Weigle, and Michael L. Nelson. Generating stories from archived collections. In *Proceedings of the 9th ACM Conference on Web Science*, pages 309–318, 2017.
- [10] Sawood Alam, Mat Kelly, Michele C. Weigle, and Michael L. Nelson. Client-side reconstruction of composite Mementos using ServiceWorker. In *JCDL '17: Proceedings of the 17th ACM/IEEE-CS Joint Conference on Digital Libraries*, pages 237–240, 2017.
- [11] John A. Berlin, Mat Kelly, Michael L. Nelson, and Michele C. Weigle. WAIL: Collection-based personal web archiving. In *JCDL '17: Proceedings of the 17th ACM/IEEE-CS Joint Conference on Digital Libraries*, pages 340–341, 2017.
- [12] Justin F. Brunelle, Michele C. Weigle, and Michael L. Nelson. Archival crawlers and javascript: Discover more stuff but crawl more slowly. In *JCDL '17: Proceedings of the 17th ACM/IEEE-CS Joint Conference on Digital Libraries*, pages 1–10, 2017.
- [13] Mat Kelly, Lulwah M. Alkwai, Sawood Alam, Michael L. Nelson, Michele C. Weigle, and Herbert Van de Sompel. Impact of URI canonicalization on Memento count. In *JCDL '17: Proceedings of the 17th ACM/IEEE-CS Joint Conference on Digital Libraries*, pages 303–304, 2017. (Also available as arXiv:1703.03302).
- [14] Alexander C. Nwala, Michele C. Weigle, Michael L. Nelson, Adam B. Ziegler, and Anastasia Aizman. Local Memory Project: Providing tools to build collections of stories for local events from local sources. In *JCDL '17: Proceedings of the 17th ACM/IEEE-CS Joint Conference on Digital Libraries*, pages 219–228, 2017.
- [15] Mat Kelly, Sawood Alam, Michael L. Nelson, and Michele C. Weigle. Interplanetary wayback: Peer-to-peer permanence of web archives. In *Proceedings of Theory and Practice of Digital Libraries (TPDL)*, pages 411–416, 2016.
- [16] Sawood Alam, Michael L. Nelson, Herbert Van de Sompel, and David S. H. Rosenthal. Web archive profiling through fulltext search. In *Proceedings of Theory and Practice of Digital Libraries (TPDL)*, pages 121–132, 2016.
- [17] Sawood Alam, Mat Kelly, and Michael L. Nelson. InterPlanetary Wayback: The permanent web archive. In *JCDL '16: Proceedings of the 16th ACM/IEEE-CS Joint Conference on Digital Libraries*, pages 273–274, 2016.
- [18] Sawood Alam and Michael L. Nelson. Memgator - a portable concurrent memento aggregator: Cross-platform cli and server binaries in go. In *JCDL '16: Proceedings of the 16th ACM/IEEE-CS Joint Conference on Digital Libraries*, pages 243–244, 2016.
- [19] Alexander Nwala and Michael L. Nelson. A supervised learning algorithm for binary domain classification of web queries using serps. In *JCDL '16: Proceedings of the 16th ACM/IEEE-CS Joint Conference on Digital Libraries*, pages 237–238, 2016.
- [20] Justin F. Brunelle, Michele C. Weigle, and Michael L. Nelson. Archiving deferred representations using a two-tiered crawling approach. In *iPRES 2015: Proceedings of the 12th International Conference on Preservation of Digital Objects*, 2015. (Also available as arXiv:1508.02315).
- [21] Scott G. Ainsworth, Michael L. Nelson, and Herbert Van de Sompel. Only one out of five archived web pages existed as presented. In *Proceedings of ACM Hypertext*, pages 257–266, 2015.
- [22] Sawood Alam, Michael L. Nelson, Herbert Van de Sompel, Lyudmila Balakireva, Harihar Shankar, and David S. H. Rosenthal. Web archive profiling through cdx summarization. In *Proceedings of Theory and Practice of Digital Libraries (TPDL)*, pages 3–14, 2015.

- [23] Mohamed Aturban, Michael L. Nelson, and Michele C. Weigle. Quantifying orphaned annotations in Hypothes.is. In *Proceedings of Theory and Practice of Digital Libraries (TPDL)*, pages 15–27, 2015.
- [24] Yasmin AlNoamany, Michele C. Weigle, and Michael L. Nelson. Detecting off-topic pages in web archives. In *Proceedings of Theory and Practice of Digital Libraries (TPDL)*, pages 225–237, 2015.
- [25] Yasmin AlNoamany, Michele C. Weigle, and Michael L. Nelson. Characteristics of social media stories. In *Proceedings of Theory and Practice of Digital Libraries (TPDL)*, pages 267–279, 2015.
- [26] Hany M. SalahEldeen and Michael L. Nelson. Predicting temporal intention in resource sharing. In *JCDL '15: Proceedings of the 15th ACM/IEEE-CS Joint Conference on Digital Libraries*, pages 205–214, 2015.
- [27] Wesley Jordan, Mat Kelly, Justin F. Brunelle, Laura Vobrak, Michele C. Weigle, and Michael L. Nelson. Mobile mink: Merging mobile and desktop archived webs. In *JCDL '15: Proceedings of the 15th ACM/IEEE-CS Joint Conference on Digital Libraries*, pages 243–244, 2015.
- [28] Lulwah Alkwai, Michael L. Nelson, and Michele C. Weigle. How well are Arabic websites archived? In *JCDL '15: Proceedings of the 15th ACM/IEEE-CS Joint Conference on Digital Libraries*, pages 223–232, 2015.
- [29] Sawood Alam, Fateh ud din B Mehmood, and Michael L. Nelson. Improving accessibility of archived raster dictionaries of complex script languages. In *JCDL '15: Proceedings of the 15th ACM/IEEE-CS Joint Conference on Digital Libraries*, pages 47–56, 2015. (Also available as arXiv:1409.1284).
- [30] Mat Kelly, Michael L. Nelson, and Michele C. Weigle. The archival acid test: Evaluating archive performance on advanced HTML and JavaScript. In *JCDL '14: Proceedings of the 14th ACM/IEEE-CS Joint Conference on Digital Libraries*, pages 25–28, 2014.
- [31] Mat Kelly, Michael L. Nelson, and Michele C. Weigle. Mink: Integrating the live and archived web viewing experience using web browsers and Memento. In *JCDL '14: Proceedings of the 14th ACM/IEEE-CS Joint Conference on Digital Libraries*, pages 469–470, 2014.
- [32] Justin F. Brunelle, Mat Kelly, Hany SalahEldeen Michele C. Weigle, and Michael L. Nelson. Not all mementos are created equal: Measuring the impact of missing resources. In *JCDL '14: Proceedings of the 14th ACM/IEEE-CS Joint Conference on Digital Libraries*, pages 321–330, 2014.
- [33] Charles L. Cartledge and Michael L. Nelson. When should I make preservation copies of myself? In *JCDL '14: Proceedings of the 14th ACM/IEEE-CS Joint Conference on Digital Libraries*, pages 1–10, 2014.
- [34] Ahmed AlSum and Michael L. Nelson. Thumbnail summarization techniques for web archives. In *ECIR '14: Proceedings of the 36th European Conference in Information Retrieval*, pages 299–310, 2014.
- [35] Frank McCown and Michael L. Nelson. Resources for teaching web science to computer science undergraduates. In *Proceedings of ACM SIGCSE*, 2014.
- [36] Mat Kelly, Michael L. Nelson, and Michele C. Weigle. Graph-based navigation of a box office prediction system. In *Proceedings of IEEE Visualization (VIS 2013)*, 2013.
- [37] Mat Kelly, Justin F. Brunelle, Michele C. Weigle, and Michael L. Nelson. On the change in archivability of websites over time. In *Proceedings of Theory and Practice of Digital Libraries (TPDL)*, pages 35–47, 2013.
- [38] Justin F. Brunelle, Michael L. Nelson, Lyudmila Balakireva, Robert Sanderson, and Herbert Van de Sompel. Evaluating sitestory with the ApacheBench tool. In *Proceedings of Theory and Practice of Digital Libraries (TPDL)*, pages 204–215, 2013.

- [39] Yasmin AlNoamany, Ahmed AlSum, Michele C. Weigle, and Michael L. Nelson. Who and what links to the Internet Archive. In *Proceedings of Theory and Practice of Digital Libraries (TPDL)*, pages 346–357, 2013.
- [40] Ahmed AlSum, Michele C. Weigle, Michael L. Nelson, and Herbert Van de Sompel. Profiling web archive coverage for top-level domain and content language. In *Proceedings of Theory and Practice of Digital Libraries (TPDL)*, pages 60–71, 2013.
- [41] Hany M. SalahEldeen and Michael L. Nelson. Resurrecting my revolution: Using social link neighborhood in bringing context to the disappearing web. In *Proceedings of Theory and Practice of Digital Libraries (TPDL)*, pages 333–345, 2013.
- [42] Justin F. Brunelle and Michael L. Nelson. An evaluation of caching policies for memento timemaps. In *JCDL '13: Proceedings of the 13th ACM/IEEE-CS Joint Conference on Digital Libraries*, pages 267–276, 2013.
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- [70] Joseph A. Kaplan and Michael L. Nelson. A comparison of queueing, cluster and distributed computing systems. Technical Report NASA TM-109025, NASA Langley Research Center, 1993.

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## Tutorials

- 2014-09-22 “Tools and Techniques for Revisiting Online Scholarly Content” (with Herbert Van de Sompel and Martin Klein and Richard Wincewicz), JCDL 2014 Tutorial, London UK
- 2013-09-22 “ResourceSync: The NISO/OAI Resource Synchronization Framework” (with Herbert Van de Sompel and Martin Klein and Robert Sanderson), TPDJL 2013 Tutorial, Valetta Malta
- 2008-06-16 “Object Reuse and Exchange: The OAI-ORE Framework” (with Carl Lagoze, Herbert Van de Sompel and Simeon Warner), ACM/IEEE JCDL 2008 Tutorial, Pittsburgh PA
- 2006-06-(14-16) OAI-PMH Tutorial and Consultation, University of Southern California Libraries
- 2003-05-27 “Advanced Tutorial on Open Archives Initiative” (with Herbert Van de Sompel and Simeon Warner), ACM/IEEE JCDL 2003 Tutorial, Houston TX
- 2002-07-14 “Advanced Overview of Version 2.0 of the Open Archives Initiative Protocol for Metadata Harvesting” (with Herbert Van de Sompel and Simeon Warner), ACM/IEEE JCDL 2002 Tutorial, Portland OR

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## Invited Presentations

- 2017-02-21 “Web Archiving Activities of ODU’s Web Science and Digital Library Research Group, Symposium on Web Archiving Interoperability, San Francisco, CA
- 2017-02-17 “The Memento Protocol and Research Issues With Web Archiving”, ODU Chemistry Department Colloquium, Norfolk, VA
- 2017-02-16 “The Memento Protocol and Research Issues With Web Archiving”, VCU CS Department Colloquium, Richmond, VA
- 2016-09-12 “The Memento Protocol and Research Issues With Web Archiving”, UVA Library Colloquium, Charlottesville, VA

2016-08-22 "We Need Multiple, Independent Web Archives", Documenting the Now Advisory Board, St. Louis, MO

2016-04-11 "Combining Heritrix and PhantomJS for Better Crawling of Pages with Javascript", IIPC General Assembly, Reykjavik, Iceland

2016-04-05 "Storytelling for Summarizing Collections in Web Archives", CNI Spring 2016, San Antonio, TX

2016-04-03 "Why We Need Multiple Archives", Digital Preservation of Federal Information Summit CNI Spring 2016, San Antonio, TX

2015-11-13 "Combining Storytelling and Web Archives", ODU EE Department Colloquium, Norfolk, VA

2015-04-28 "Evaluating the Temporal Coherence of Archived Pages", IIPC General Assembly, Stanford, CA

2015-02-24 "Information Loss and Decay of the World Wide Web", The Declinism Seminars: Decay, Cambridge, MA

2014-07-23 "Assessing the Quality of Web Archives", Digital Preservation 2014, Washington DC

2013-09-06 "Who Will Archive the Archives? Thoughts About the Future of Web Archiving", Wolfram Data Summit 2013, Washington DC

2013-04-23 "More Archives, More Better", IIPC General Assembly 2013, Ljubljana, Slovenia

2013-04-22 "Old Dominion University Computer Science IIPC New Member", IIPC General Assembly 2013, Ljubljana, Slovenia

2012-09-10 "A Plan For Curating "Obsolete Data or Resources"", UNC/NSF Workshop "Curating for Quality: Ensuring Data Quality to Enable New Science", Arlington, VA

2011-10-24 "Memento: Time Travel for the Web", UNT College of Information Colloquium, Denton, TX

2011-10-24 "Memento: Time Travel for the Web", UNT College of Information Colloquium, Denton, TX

2011-05-10 "Memento: Updated technical details", 2011 IIPC General Assembly, The Hague, the Netherlands

2010-11-10 "Memento: Time Travel for the Web", UNC Scholarly Communications Working Group, Chapel-Hill, NC

2010-09-09 "My Point of View", Web Archiving Cooperative Kick-off Meeting, Menlo-Park, CA

2010-09-09 "Review of Web Archiving", Web Archiving Cooperative Kick-off Meeting, Menlo-Park, CA

2010-06-21 "Memento: Time Travel for the Web", NDIIPP Partners Meeting, Washington DC

2009-12-15 "Memento: Time Travel for the Web", CNI Fall 2009 Project Briefing, Washington DC

2009-11-16 "Memento: Time Travel for the Web", Library of Congress Brown Bag Seminar, Washington DC

2009-10-29 "The Open Archives Initiative Object Reuse and Exchange Project", Keynote at RIBDA 2009, Lima Peru

2009-10-15 "The Open Archives Initiative Object Reuse and Exchange Project", Keynote at WCI 2009, Berlin Germany

2009-10-02 "(Re-)Discovering Lost Web Pages", Emory University Computer Science Department Colloquium, Atlanta GA

2009-10-01 "The Open Archives Initiative Object Reuse and Exchange Project", Emory University Library Colloquium, Atlanta GA

2009-06-25 "Synchronicity: Just-In-Time Discovery of Lost Web Pages", NDIIPP Partners Meeting, Washington DC

2009-03-13 "Can't Find Your 404s?", Santa Fe Complex Colloquium, Santa Fe NM

2009-03-12 "(Re-)Discovering Lost Web Pages", LANL Research Library Colloquium, Los Alamos NM

2008-09-07 "Tools for a Preservation-Ready Web", NDIIPP Partners Meeting, Ballston VA

2008-07-20 "Recommendations for a NASA Digital Library", NASA LaRC Technical Library Branch, Hampton VA

2007-05-16 "The Open Archives Initiative", Digital data preservation, sharing, and discovery: Challenges for Small Science Communities in the Digital Era, Durham NC

2007-01-17 "Using OAI-PMH Resource Harvesting & MPEG-21 DIDL for Digital Preservation", NDIIPP Partners Meeting, San Diego CA

2006-12-06 "How much preservation do I get if I do absolutely nothing? Using the Web Infrastructure for Digital Preservation", Media Production 2006, Berlin Germany

2006-12-01 "Evaluating Ingest Success: Using the AIHT", DCC/LUCAS Workshop, Liverpool UK

2006-06-29 "Thinking Differently About Web Page Preservation", Library of Congress Seminar, Washington DC

2005-10-20 "What's new from the OAI", OAI-4, Geneva Switzerland

2005-10-20 "OAI-PMH for resource harvesting", OAI-4, Geneva Switzerland

2005-07-12 "ODU AIHT", NDIIPP Partners Meeting, Warrenton VA

2005-06-23 "A New Model for Web Resource Harvesting", NASA/Raytheon Technology Infusion Team Meeting, Hampton VA

2005-05-17 "Shared Infrastructure Preservation Models", DIGARCH PI Meeting, Atlanta GA

2005-05-05 "Harvesting Resources with OAI-PMH", SOLINET Annual Membership Meeting, Atlanta GA

2005-03-29 "A New Model for Web Resource Harvesting", University of Florida Department of Computer Science Colloquium

2004-05-28 "Implementation of Digital Libraries", International Congress of Health Information, Lima Peru

2004-05-06 "A Review of Institutional Repository Projects and Technologies", Texas A&M Department of Computer Science Colloquium

2003-11-03 "New Digital Library Possibilities Using the OAI-PMH", First Latin American Workshop on the Production and Diffusion of Electronic Theses, Santiago Chile

2003-09-16 "Self-Preserving Digital Objects", AISTI Mini Conference, Santa Fe New Mexico

- 2003-09-12 "Institutional Archives Technology Overview", FLICC Workshop: Institutional Archives and Repositories in Government, Washington DC
- 2003-06-24 "U.S. Government Use of the OAI-PMH", IndoUS Workshop on Open Digital Libraries and Interoperability, Arlington VA
- 2003-03-20 "U.S. Government Use of the OAI-PMH", ISTE / NSF Ibero-American Digital Library Joint Project Development Symposium, Campinas, Brazil
- 2003-02-05 "Service Providers: Future Perspectives", Professional Scholarly Publishing Annual Conference, Washington DC
- 2002-10-18 "Service Providers: Future Perspectives", OAI Workshop, CERN Switzerland
- 2002-10-02 "New Digital Library Possibilities Using the Open Archives Initiative Protocol for Metadata Harvesting (OAI-PMH)", International Conference on Scientific Electronic Publishing in Developing Countries, Valparaiso, Chile
- 2002-05-13 "New Developments in OAI", Open Archives Forum, Pisa Italy
- 2002-04-03 "OAI: XML-Based Digital Library Interoperability", CENDI: Federal STI Managers Meeting, Beltsville MD
- 2001-08-16 "OAI : Past, Present and Future", Managing Digital Video Content Workshop, Atlanta GA
- 2001-07-11 "OAI : Past, Present and Future", Open Archives Meeting: Developing an Agenda for Institutional E-print Archives, London UK
- 2001-04-21 "Uses of OAI in NASA", NASA STI Managers Meeting, Greenbelt MD
- 2000-12-12 "The Open Archives Initiative", Exploration 2000: Workshop on Web-Based Language Documentation and Description, Philadelphia, PA
- 1999-11-09 "Smart Objects and Dumb Archives: Using Buckets in Digital Libraries", ICASE Colloquium, Hampton, VA
- 1996-10-24 "Understanding the Internet's Role in Technology Transfer and Organizational Strategy", October Meeting of the Pittsburgh Large User Group (PLUG), Pittsburgh, PA
- 1996-10-09 "Using DCE/DFS in a Production Workstation Cluster", ICASE/LaRC 2nd Industry Roundtable, Williamsburg, VA
- 1996-06-24 "WWW: An Overview of Technologies, Concepts, and Directions", Army Training Support Center, Fort Eusits, VA
- 1994-10-22 "Changing the Way We do Business Through Use of the World Wide Web and NCSA Mosaic", Virginia Society of Professional Engineers, Hampton, VA
- 1993-05-11 "PVM Use in Computational Aerospaces Projects", First PVM Users Group Meeting, Knoxville, TN

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## Ph.D. Students

- 2007 **Frank McCown**, *Assistant Professor, Harding University*, Dissertation Title: Lazy Preservation: Reconstructing Websites from the Web Infrastructure.
- 2008 **Joan A. Smith**, *Chief Technology Strategist, Emory University Libraries*, Dissertation Title: Integrating Preservation Functions Into the Web Server.
- 2011 **Martin Klein**, *Post-doctoral Researcher, Los Alamos National Laboratory*, Dissertation Title: Using the Web Infrastructure for Real Time Recovery of Missing Web Pages.
- 2014 **Ahmed Alsum**, *Web Archive Engineer, Stanford University Libraries*, Dissertation Title: Web Archive Services Framework For Tighter Integration Between the Past and Present Web.
- 2014 **Charles L. Cartledge**, *System Engineer, Fulcrum LLC*, Dissertation Title: Unsupervised Small-World (USW): A Framework for Web Object Self-Preservation.
- 2015 **Hany SalahEldeen**, *Technical Staff, Microsoft*, Detecting, Modeling, and Predicting User Temporal Intention in Social Media.
- 2016 **Justin Brunelle**, *Lead Researcher, MITRE*, Scripts in a Frame: A Framework for Archiving Deferred Representations.
- 2016 **Yasmin AlNomany**, *Post-doctoral Researcher, UC Berkeley*, Using Web Archives to Enrich the Live Web Experience Through Storytelling.
- current **Scott Ainsworth**, Dissertation Topic: Evaluation of Inter-Archive Access Policies.
- current **Sawood Alam**, Dissertation Topic: Routing of Memento Queries.
- current **Shawn Jones**, Dissertation Topic: Summarizing Archive Collections with Storytelling Techniques.
- current **Louis Nguyen**, Dissertation Topic: Alternative Access Methods for Earth Science Data.
- current **Alexander Nwala**, iDissertation Topic: Generating Archive Collections from Social Media.

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## M.S. Students

### Thesis Option

- 2005 Terry L. Harrison, Thesis Title: Opal: In Vivo Based Preservation Framework for Locating Lost Web Pages
- 2008 Rabia Haq, Thesis Title: Using Timed-Release Cryptography to Mitigate the Preservation Risk of Embargo Periods

2013 Sawood Alam, Thesis Title: HTTP Mailbox - Asynchronous RESTful Communication  
2015 Shawn Jones, Thesis Title: Using the Memento MediaWiki Extension to Avoid Spoilers  
current Nauman Siddique  
current Miranda Smith

## Project Option

2004 Sheffan Chan, Thomas Lutkenhouse  
2005 Aravind Elango, Giridhar Manepalli, Suchitra Manepalli, Daniel Swaney  
2006 Ignacio Garcia del Campo  
2007 Amine Benjelloun, Manoranjan Magudam  
2008 Olena Hunsicker, Venkata Sai Krishna Kamineni, Satish Lakkoju, Krishnan Ganesh Madras  
2009 Sudhir Koneru, Venkata Potta  
2010 Scott Ainsworth, Matthias Prellwitz, Jeffery Shipman, Jeb Ware  
2011 Carlton Northern

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## Teaching

### Old Dominion University

CS 895 Web-Based Information Retrieval - S14, S13, F11  
CS 895 Time on the Web - F10  
CS 795/895 Collective Intelligence - S09  
CS 791/891 Web Archiving Seminar - F17  
CS 791/891 Web Syndication Formats - S08  
CS 791/891 Technologies of Google Seminar - S07  
CS 791/891 Economics of Information Seminar - S06  
CS 791/891 Digital Preservation Seminar - S05, S04  
CS 751/851 Introduction to Digital Libraries - S15, S11, S10, F06  
CS 734/834 Introduction to Information Retrieval - F17, F16, F15  
CS 695 Introduction to Digital Libraries - F05, F04, F03, F02  
CS 495/595 Introduction to Web Science - F14, F13  
CS 495/595 Peer-to-Peer Information Systems - F04, F03  
CS 495/595 Web Server Design - S12, S09, S07, S06  
CS 432/532 Web Science - S17, S16  
CS 418/518 Web Programming - F08, F07, F06  
CS 410 Computer Based Productivity I - S03

### University of North Carolina

INLS 110 Introduction to Digital Libraries - S01  
INLS 210 Complex Objects for Digital Libraries - S01

### Old Dominion University (While at NASA LaRC)

CS 495/595 Introduction to Digital Libraries - F99  
CS 745/845 Introduction to Digital Libraries - F98

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## Service

### Editorial Boards

2005-present International Journal of Digital Libraries (IJDL)  
2005-2006 ACM Journal on Education Resources in Computing (JERIC)

### Steering Committees

2014-2017 JCDL Steering Committee Chair  
2011-2014 JCDL Steering Committee

## Organizing Committees

- 2013 Program Co-Chair, 10th International Conference on Preservation of Digital Objects (iPRES)  
2012 Program Co-Chair, ACM/IEEE Joint Conference on Digital Libraries  
2011, 2009, 2008 Doctoral Consortium Co-Chair, ACM/IEEE Joint Conference on Digital Libraries  
2011, 2007 Workshop Chair, ACM/IEEE Joint Conference on Digital Libraries  
2006 Program Co-Chair, ACM/IEEE Joint Conference on Digital Libraries  
2005 Tutorial Co-Chair, ACM/IEEE Joint Conference on Digital Libraries  
2002 Co-Chair, Workshop on Distributed Computing Architectures for Digital Libraries (joint with ICPP 2002)  
2001 Sponsoring and Exhibiting Chair, ACM/IEEE Joint Conference on Digital Libraries  
2001 Co-Chair, Workshop on Experimental OAI-Based Digital Library Systems (joint with ECDL 2001)

## Program Committees

- 2014 Digital Preservation (NDIIPP/NDSA)  
2017–2013, 2011–2007, 2005–2002 ACM/IEEE Joint Conference on Digital Libraries (JCDL)  
2017–2010 ACM Special Interest Group on Information Retrieval (SIGIR)  
2012 ACM International Conference on Web Search and Data Mining (WSDM)  
2009, 2007, 2005 ACM Workshop on Web Information and Data Management (WIDM)  
2010, 2009 European Conference on Digital Libraries (ECDL)  
2005–2003 Healthcare Digital Libraries Workshop (HDL)  
2016–2011, 2008, 2007 International Conference on Asian Digital Libraries (ICADL)  
2009 International Workshop on Innovation in Digital Preservation (InDP)  
2010, 2009 International Web Archiving Workshop (IWAW)  
2009 International World Wide Web Conference (WWW)  
2016–2011 Temporal Web Analytics Workshop (TAWW)  
2017–2011 Theory and Practice of Digital Libraries (TPDL)

## Reviewer

- ACM Journal on Educational Resources in Computing
- ACM Transactions on Internet Technology
- ACM Transactions on the Web
- Communications of the ACM
- Data & Knowledge Engineering
- IEEE Internet Computing
- IEEE Intelligent Systems
- IEEE Systems, Man and Cybernetics Part A
- IEEE Transactions on Computers
- IEEE Transactions on Parallel and Distributed Systems
- Information Sciences
- International Journal of Digital Libraries
- Health Informatics Journal

## Advisory Boards

- 2018-present ODU MLIS Advisory Board  
2017-2019 ACM Publications Board  
2016-present Documenting the Now  
2013-present Virginia Tech, Integrated Digital Event Archiving and Library (IDEAL)  
2006-present University of Arizona, Graduate Certificate in Digital Information Management  
2001-present Open Language Archive Community (OLAC)  
2008-2010 H-Net Archivist Advisory Board

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## Professional Society Memberships

- Member, Association of Computing Machinery (ACM)