

Summary of Accomplishments for Michael L. Nelson in CY 2002

Research Statement

My research is in the area of digital libraries (DLs), specifically concerning the representation, responsibilities and interfaces between archives (or repositories) and the stored objects themselves. Regarding archives, I served as the co-editor for the Open Archives Initiative Protocol for Metadata Harvesting (OAI-PMH). OAI-PMH 2.0 was released in July 2002. Future changes to the protocol are not anticipated in the near future, but ancillary work continues (e.g., my work on the Static Repository Gateway for OAI-PMH). Regarding digital objects, I am continuing my research on “buckets”, intelligent mobile archival storage units. Future research directions for buckets include tuning them for information preservation.

Positions Held

- Assistant Professor, Old Dominion University, Department of Computer Science, Norfolk Virginia, July 2002 - present
- Consultant, Institute for Computer Applications in Science and Engineering (ICASE), Hampton Virginia, July 2002 – December 2002
- Computer Engineer, NASA Langley Research Center, Hampton Virginia, until July 2002

Students

1. Sridhar Adusumilli, MS
2. Aravind Elango, MS
3. Terry Harrison, MS

Classes Taught

1. CS 695, Introduction to Digital Libraries, Fall 2002. 16 students (evaluations not yet available).

Current Funding

1. Kepler -- A Communal Digital Library, 2002-2004 (Co-PI, with K. Maly (ODU), M. Zubair (ODU), \$700,000, NSF 0205486)
2. An OAI-Compliant Federated Physics Digital Library for the NSDL, 2001-2002 (Co-PI, with K. Maly (ODU), M. Zubair (ODU), \$479,997, NSF 0121656)

Pending Funding

1. ITR: Collaborative Research: Grace: A Framework for Third Party Interface Servers for Digital Content (PI, with J. Bollen (ODU), G. Marchionini (UNC), \$278,836, NSF 02-0168)

Book Chapters Accepted for Publication

1. Michael L. Nelson, Digital Objects for Knowledge Preservation, in *Knowledge Management Technologies and Applications at NASA*, J. Liebowitz (ed.), Government Printing Office, 2002.

Journal Articles Accepted for Publication

1. Michael L. Nelson, JoAnne Rocker and Terry L. Harrison, OAI and NASA Scientific and Technical Information, Accepted for Publication, *Library Hi-Tech*, 2003.

Journal Articles Published

1. Xiaoming Liu, Tim Brody, Stevan Harnad, Les Carr, Kurt Maly, Mohammad Zubair, Michael L. Nelson, A Scalable Architecture for Harvest-Based Digital Libraries - The ODU/Southampton Experiments, *D-Lib Magazine* 8(11), 2002
2. 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), May 2002.
3. Michael L. Nelson, Better Interoperability Through the Open Archives Initiative, *New Review of Information Networking*, 7, 2002, pp. 133-146.
4. Michael L. Nelson and B. Danette Allen, Object Persistence and Availability in Digital Libraries, *D-Lib Magazine*, 8(1), 2002.

Refereed Conference Papers Published

1. X. Liu, K. Maly, M. Zubair, R. Tang, M. Padshah, G. Roncaglia, J. Rocker, M. Nelson, W. von Ofenheim, R. Luce, J. Stack, F. Knudson, B. Goldsmith, I. Holtkamp, M. Blake, J. Carter, M. Di Giacomo, J. Nutter, S. Brown, R. Montbrand, S. Landenberger, K. Pierson, V. Duran and B. Moser, Technical Report Interchange Through Synchronized OAI Caches, *Proceedings of the Sixth European Conference on Digital Libraries*, Rome Italy, September 16-18 2002.

2. Johan Bollen and Michael L. Nelson, Adaptive Networks of Smart Objects, *Proceedings of the Workshop on Distributed Computing Architectures in Digital Libraries, International Conference on Parallel Processing*, Vancouver Canada, August 18-21, 2002.
3. Xiaoming Liu, Kurt Maly, Mohammad Zubair, and Michael L. Nelson, DP9: An OAI Gateway Service for Web Crawlers, *Proceedings of the Second ACM/IEEE Joint Conference on Digital Libraries*, Portland Oregon, July 13-17, 2002.
4. H. Anan, X. Liu, K. Maly, M. Nelson, M. Zubair, J. C. French, E. Fox, P. Shivakumar, Preservation and Transition of NCSTRL Using an OAI-Based Architecture, *Proceedings of the Second ACM/IEEE Joint Conference on Digital Libraries*, Portland Oregon, July 13-17, 2002.

Other Publications

1. Carl Lagoze, Herbert Van de Sompel, Michael L. Nelson, Simeon Warner, “The Open Archives Initiative Protocol for Metadata Harvesting”, Protocol Version 2.0, July 2002.
2. Michael L. Nelson, Kurt Maly, Mohammad Zubair and Diann Rucsh-Feja (Editors), “Experimental OAI-Based Digital Library Systems”, NASA/TM-2002-211638, April 2002. (Proceedings of a Workshop Held at ECDL 2001, Darmstadt Germany).
3. JoAnne Rucker, George J. Roncaglia, Lynn N. Heimerl and Michael L. Nelson, The NASA Scientific and Technical Information (STI) Program's Implementation of Open Archives Initiative (OAI) for Data Interoperability and Data Exchange, SLA 2002 Annual Special Libraries Association Conference, Los Angeles, California, June 8-13, 2002.

Invited Presentations & Tutorials

1. Invitational Web Services Seminar, OCLC Office of Research, Dublin OH, December 16-17, 2002.
2. “Service Providers: Future Perspectives”, Second Workshop on Open Archives Initiative, Geneva Switzerland, October 15-20 2002.
3. “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, September 30 – October 2, 2002
4. “Advanced Overview of Version 2.0 of the Open Archives Initiative Protocol for Metadata Harvesting”, Half-day tutorial at the Second ACM/IEEE Joint

- Conference on Digital Libraries. (with Herbert Van de Sompel and Simeon Warner)
5. "New Developments in OAI", Open Archives Forum, Pisa Italy, May 13, 2002
 6. "OAI: XML-Based Digital Library Interoperability", CENDI: Federal STI Managers Meeting, Bethesda MD, April 3, 2002

Service

1. Co-Chair, Workshop on Distributed Computing Architectures in Digital Libraries, 2002 International Conference on Parallel Processing (ICPP 2002)
2. Sponsoring and Exhibiting Chair, Second ACM/IEEE Joint Conference on Digital Libraries (JCDL 2002)
3. Member, Program Committee, Second ACM/IEEE Joint Conference on Digital Libraries (JCDL 2002)
4. Reviewer, NSF National Science Digital Library (NSDL) Program, May 20-23 2002
5. Member, Open Archives Initiative Technical Committee
6. Mentor, Langley Aerospace Summer Scholar (LARSS) Program: Terry L. Harrison (ODU) and Jessica M. Crane (CNU), Summer 2002.
7. Coordinator, Atmospheric Sciences Data Center Digital Library Seminar Series

Research and Development

1. Design, editing, evaluation and testing of Version 2.0 of the Open Archives Initiative Protocol for Metadata Harvesting. Co-editor of the protocol specification document, migration instructions and implementation guidelines (www.openarchives.org).
2. Ongoing design and implementation of the OAI-PMH based version of the NASA Technical Report Server (NTRS, ntrs.nasa.gov). Provided consultation to other NASA field centers regarding OAI-PMH and NTRS integration.
3. Development and delivery of OAI-PMH data provider source code to Johnson Space Center and Glenn Research Center.
4. Design consultation to the Technical Report Interchange (TRI) Project (joint with LANL, AFRL, Sandia and ODU).

5. Design consultation to the Archon Project (archon.cs.odu.edu; joint with LANL, APS, UPenn and ODU).
6. Design consultation to the NCSTRL Project (www.ncstrl.org; joint with Va Tech, UVa, and ODU).
7. Preliminary investigation of bucket applicability to flight test and simulation data. Working with Arild Bertelrud (AS&M, Flow Physics and Control Branch).