

Digital Library Education in Computer Science Programs

Jeffrey Pomerantz

Sanghee Oh

Barbara M. Wildemuth

School of Information and Library Science

University of North Carolina – Chapel Hill

Chapel Hill, NC 27599-3360

+1 919-962-8366

<pomerantz, shoh, wildem>@unc.edu

Seungwon Yang

Edward A. Fox

Department of Computer Science

Virginia Tech

Blacksburg, VA 24061

+1 540-231-5113

<seungwon, fox>@vt.edu

ABSTRACT

In an effort to identify the “state of the art” in digital library education in computer science (CS) programs, we analyzed CS courses on digital libraries and digital library-related topics. Fifteen courses that mention digital libraries in the title or short description were identified; of these, five are concerned with digital libraries as the primary topic of the course. The readings from these five courses were analyzed further, in terms of their authors and the journals in which they were published.

Categories and Subject Descriptors

K.3.2 [Computers and Education]: Computer and Information Science Education – *computer science education, curriculum, information systems education.*

General Terms

Management

Keywords

Digital libraries, Digital librarianship, Computer science, Library and information science, Education, Curriculum development

1. INTRODUCTION

In a previous study [5], the state of the art in digital library (DL) education in Library and Information Science (LIS) programs was examined by identifying the readings assigned in LIS DL courses and the topics of these readings. The authors found that 52% of accredited LIS Master’s programs¹ offered courses on DLs between 2003 and 2006, a total of 40 courses. Most of these programs offer only one DL course, but some offer multiple courses; in these programs, generally one course is an introductory DL course, and others are “special topics” courses. The authors identified 1,777 titles for readings in the 40 collected syllabi. From these, the authors identified the most frequently assigned authors, book titles, journals, and journal articles.

Given that the domain of DLs is of concern to scholars and practitioners in both LIS and computer science (CS), we would expect both to offer graduate programs/courses in DLs. Thus, the

current study of CS courses was undertaken to complement our prior study of assigned readings on DL topics in LIS courses.

2. STUDY METHODS

This study began by identifying CS programs that offer graduate degrees, in order to make these findings comparable to the earlier study of LIS programs. Programs were identified by combining three lists: programs surveyed for the Computing Research Association’s Taulbee Survey (www.cra.org/statistics/) and for the National Survey of Graduate Faculty (www.cra.org/statistics/nrcstudy2/), and programs accredited by ABET, Inc. (www.abet.org/overview.shtml). The CRA surveys include only Ph.D. programs; ABET includes all graduate-level programs. The list of course offerings in each CS program was viewed on the open web, and syllabi were collected from courses in which the phrase “Digital Library” or “Digital Libraries” was used in either the course title or short catalog description. Syllabi were collected from the open web, either from the program’s website or links on the instructor’s website. Where syllabi were not available on the web, the most recent instructor of the course was contacted by email or telephone and asked for a copy of the syllabus. Where no instructor was listed on the program’s website, the program’s main office was contacted. Only the syllabus from the most recent semester in which the course was offered was collected; thus, only one syllabus per course was analyzed.

3. RESULTS

The combined CRA and ABET lists yielded 296 CS graduate programs in the United States. Of these, only 14 programs offer courses that meet our criteria. One of these 14 programs offers two courses that fit our criteria, for a total of 15 courses. It must be noted that of these 15 courses, only 5 are concerned with DLs as the primary topic of the course.² The other 10 courses are on topics to which DLs are relevant, and vice versa, including: information retrieval, databases, multimedia computing, computer vision, and knowledge discovery. Assigned readings on DLs from these 10 courses fell into two topic categories: quality and evaluation metrics for DLs, and examples of specific DLs.

¹ The American Library Association accredits programs in LIS; 56 programs were accredited at the time of the previous study [5].

² These 5 courses were offered at Old Dominion University, Texas A&M University, University of Hawaii, Villanova University, and Virginia Tech. The course offered by the University of Hawaii was also included in the analysis of the LIS courses [5], since it is offered to students in both programs of the Department of Information and Computer Sciences.

A total of 203 readings were identified in the syllabi from the 5 courses primarily concerned with DLs. A reading was defined as a book, book chapter, journal, journal article, report, or online source. The findings presented below are, as in [5], tables that present the most frequently assigned of these 203 readings, according to several criteria. Many readings were assigned in only one course, thus giving the frequency distributions of readings very long tails. For this reason, only the top few readings of each type are shown below. The full sets of readings are available at: curric.dlib.vt.edu.

In one of the five courses, Arms' book on digital libraries [1] was the only book assigned; the other four had no assigned textbook. A total of 96 unique journal articles were identified in the collected syllabi; all but the following two were assigned in only one course:

- Bush, V. (1945). As we may think. *Atlantic Monthly*, 176(1), 101-108. (assigned in 3 courses)
- Gonçalves, M. A., et al. (2004). Streams, structures, spaces, scenarios, societies (5S): A formal model for digital libraries. *ACM Transactions on Information Systems*, 22(2), 270-312. (assigned in 2 courses)

Table 1 shows the most frequently assigned journals in CS DL courses, from a total of 38 journals identified. The right-hand column shows the number of courses in which an article from these journals was assigned. Each individual article assigned from these journals was assigned in only one course.

Table 1: Most frequently assigned journals

Author	# of assignments
<i>D-Lib Magazine</i>	16
<i>Computers in Libraries</i>	13
<i>Information Today</i>	8
<i>Online</i>	6
<i>Searcher</i>	5

Table 2 shows the most frequently assigned authors in CS DL courses, from 259 authors identified. An author was counted once for each reading on a syllabus on which his or her name appeared, whether on a single- or a multiple-authored work. Again, each article assigned by each author was assigned in only one course.

Table 2: Most frequently assigned authors

Author	# of assignments
Nelson, Michael L.	10
Arms, W. Y.	7
Fox, E. A.	6
Gonçalves, M. A.	6
Lagoze, Carl	6

In the previous study of LIS courses [5], we classified readings by topics to be covered in a DL curriculum, as identified in earlier curriculum analyses [4], as well as in [2] and [3]. The topics most frequently addressed by assigned readings in DL courses in LIS programs were Project Management and Architecture. The top two were the same in the CS courses examined, only reversed: Architecture and Project Management were the focus of 48 and 32 (24% and 16%) readings, respectively. After these top two, the

similarity with topics in LIS courses stops: Services (27, 13%), Digital Objects (23, 11%), Information/Knowledge Organization (21, 10%), and Preservation (17, 8%) were the next most frequently addressed topics in CS courses.

4. DISCUSSION AND CONCLUSION

It is worth pointing out again just how few courses in CS programs are concerned primarily with DLs. This is particularly surprising in light of the fact that the Computing Curriculum 2001 (CC2001, www.sigcse.org/cc2001/), a joint effort of ACM and IEEE-CS defining curricula for CS programs, includes DLs as one of 14 knowledge modules under Information Management. There may, of course, have been "special topics" courses on DLs offered only once by some CS programs that we did not find if they were not listed on programs' websites.

Previous results [5] indicate that there is little consistency in reading assignments across DL courses in LIS programs. The current study found even less consistency in reading assignments across DL courses in CS programs. We speculate that, as DL curricula continue to evolve (particularly if supported by interdisciplinary curriculum development projects such as the UNC-VT project, curric.dlib.vt.edu), the consistency of assigned readings across courses may increase, as the consistency of methods of teaching DL topics increases. Additionally, LIS and CS programs view some DL-related topics differently; in particular, the approaches to Architecture and Services differ. For example, in LIS courses the services addressed in assigned readings are generally user-focused (e.g., reference and personalization) while in CS courses the services addressed are generally system-focused (e.g., search engines and linking). Interdisciplinary curriculum development should make clear these trends, and help educators decide how best to help their students, departments, and the DL field.

5. ACKNOWLEDGEMENTS

This material is based upon work supported by the National Science Foundation under Grant Nos. IIS-0535057 (VT) and IIS-0535060 (UNC-CH).

6. REFERENCES

- [1] Arms, W. Y. (2000). *Digital Libraries*. Cambridge, MA: The MIT Press.
- [2] Choi, Y., & Rasmussen, E. (2006b). What is needed to educate future digital librarians: A study of current practice and staffing patterns in academic and research libraries. *D-Lib Magazine*, 12(9).
- [3] Gonçalves, M.A., et al. (2004). Streams, structures, spaces, scenarios, societies (5S): A formal model for digital libraries. *ACM Transactions on Information Systems*, 22(2), 270-312.
- [4] Pomerantz, J., et al. Curriculum Development for Digital Libraries. In *Proceedings of the 6th ACM/IEEE-CS Joint Conference on Digital Libraries*, Association for Computing Machinery, New York, 2006, 175-184.
- [5] Pomerantz, J., et al. (2006). The Core: Digital Library Education in Library and Information Science Programs. *D-Lib Magazine*, 12 (11).