

Living In the KnowEdge Society (LIKES) Initiative and iSchools' Focus on the Information Field

Poster Proposal

Seungwon Yang
Edward A. Fox
Department of Computer Science
Virginia Tech
Blacksburg, VA USA
+1 540-231-5113
{seungwon, fox}@vt.edu

Wingyan Chung
Department of Operations and Management
Information Systems
Santa Clara University
Santa Clara, CA USA
+1 408-554-4329
wchung@scu.edu

ABSTRACT

In this poster, we describe the similarities between the Living In the KnowEdge Society (LIKES) project and iSchools – both focus on the information field. This might lead to future collaborations between the two. One of the LIKES objectives is to spread computational thinking, fundamental CS/IT paradigms, key computing concepts and ICT paradigms across the Knowledge Society. This is analogous to iSchools' vision of education for thorough understanding of information, IT and their applications. In the previous three LIKES workshops, participants from various disciplines had an intense discussion about grand challenges to incorporate computing/IT in their disciplines. All iSchools have courses that teach computing and information-related topics. If those courses can be expanded for other non-computing disciplines on their campuses with support from experiences of LIKES, it would further empower professionals in the iField.

Categories and Subject Descriptors

K.3.2 [Computing Milieux]: Computer and information science education

K.4.m [Computers and Society]: Miscellaneous

General Terms

Design, Experimentation.

Keywords

iSchool, knowledge society, undergraduate education, interdisciplinary collaboration, computing, information

1. INTRODUCTION

As iSchools try to equip college graduates with skills and knowledge to work in the Information Field (iField [4]), the Living In the KnowEdge Society (LIKES) Community Building project [2] focuses broadly on preparing these graduates to live in, and to build, the emerging knowledge society of the 21st century. We expect that LIKES graduates will connect naturally with the iField, and we hope for more synergy between the two initiatives.

iSchools attempt to immerse people in the iField, which is “at the heart of everything that individuals, organizations, and societies need in order to advance any area of human endeavor, from acting

to zoology [1].” Ron Larsen, Dean of the University of Pittsburgh's School of Information Sciences, emphasizes the importance of ‘totality,’ which is to integrate information in different disciplines, with technology in society, when educating students [3]. As with LIKES, iSchools often aim to reach out to all parts of their campuses, to broaden the impact of their education, research, and service programs.

2. LIKES VISION and iSCHOOLS

LIKES was launched in 2007, as part of NSF's CPATH program to transform computing education at the undergraduate level [5]. While curricular improvements are often appropriate, it is particularly urgent that changes be made in computing-related education efforts, since there have been steep declines in the number and diversity of those studying in these areas. While information proliferates at an accelerating rate, and technologies emerge ubiquitously to help with the management of information and knowledge, fewer college graduates choose to major in computer science and information systems disciplines. To address the potential lack of adequate workforce for the knowledge society, the LIKES project tries to transform computing education to meet the challenges ahead.

In the first two years of LIKES, four universities – North Carolina A&T, Santa Clara University, Villanova University, and Virginia Tech – have been collaborating to prepare students to have an active role in the knowledge society. The goals and objectives of the LIKES project [2] are as follows:

- Goal 1: Transform computing education so graduates can help build systems, services, tools, or new paradigms for the Knowledge Society.
- Goal 2: Establish collaboration between computing educators and all other disciplines to support educating the next-generation of knowledge society builders.
- Objective 1: Ensure that all interested undergraduates are prepared for living in the emerging Knowledge Society of the 21st Century.
- Objective 2: Spread computational thinking, fundamental CS/IT paradigms, key computing concepts, and ICT paradigms across the Knowledge Society.

There is a strong synergy between our efforts and those of iSchools. In particular, Objective 2 has a close connection. For example, an excerpt from ‘What Are iSchools?’ [1] mentions, “...

This expertise must include understanding of the uses and users of information, as well as information technologies and their application.” Another example would be a course, Programming for Chemical and Life Science Informatics, which is provided by the School of Informatics at Indiana University. The course title shows that a key computing concept (programming) is incorporated in other disciplines (Chemistry and Life Sciences). If more courses similar to the aforementioned could be developed through collaboration between computing and non-computing disciplines, it will be analogous to Goal 2.

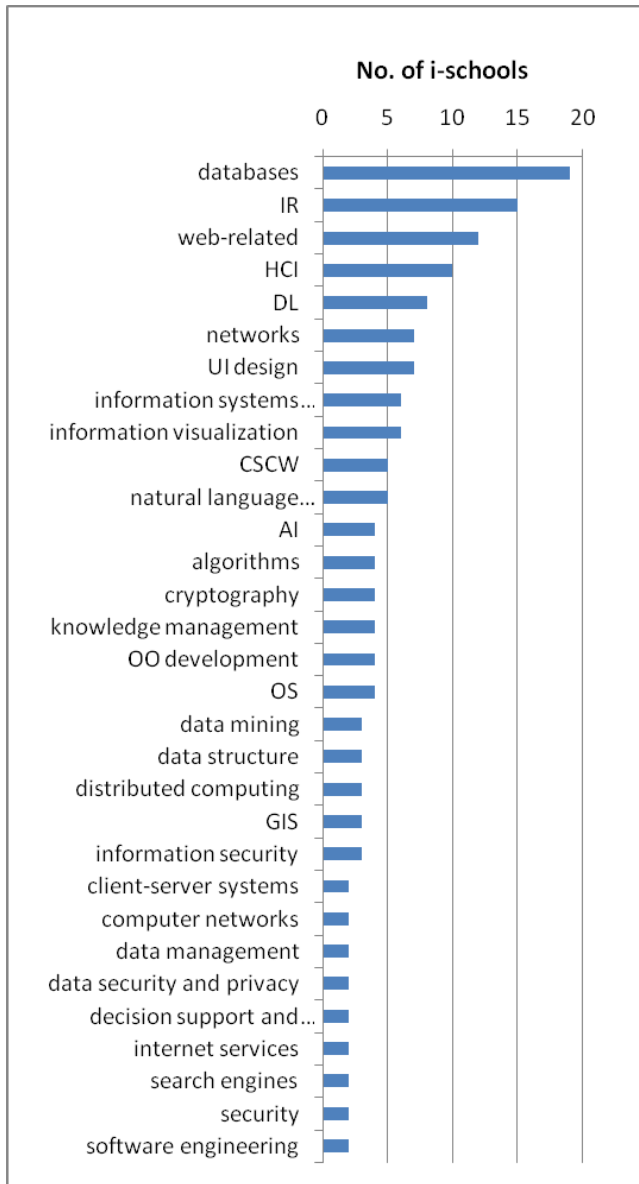


Figure 1. Computing concepts taught in iSchools (concepts presented here are taught in more than two iSchools)

Although the number of courses varies, all iSchools provide courses that teach computing concepts as well as information-related topics. Frequently, there is coverage of computing topics like: database management systems, programming, designing computing applications, human-computer interaction, security, computer-mediated communication, distributed computing, and

web architecture. Figure 1 has computing topics, which are taught in more than two iSchools. Other topics are present in Table 1. iSchool curricula often lead to coverage of many computing-related concepts, so these schools might be able to spread those concepts, as well as information-related concepts, to other disciplines on their campuses. That would further empower professionals in the iField.

Table 1. Other computing topics taught in iSchools (each one is taught in one iSchool)

architectures	machine learning
broadband wireless tech.	multimedia systems
classification systems	music information processing
communication protocols	network system admin.
computational informatics	networked computing
computer architecture	networking and internet tech.
computer concepts	programming
computer design	programming languages
computer-mediated comm.	rapid prototyping and eval.
cyber security	recommender systems
data compression	semantic web
data modeling	social computing
data visualization	software development
design of complex web sites	software foundations
digital government	software systems
e-government	statistics and data analysis
expert systems	text mining
hypermedia education	video game design
indexing and abstracting sys.	wireless interactive comm.
interactive system design	XML
interoperability issues	

3. LESSONS LEARNED AND CHALLENGES

In the three previous LIKES workshops, there was intensive discussion of computing concepts, as well as their application in different disciplines, such as geography, history, music, biology, architecture, physics, chemistry, mathematics, etc. We found that students of these disciplines all benefit from learning computing concepts and more needs to be done to integrate these concepts into their curricula. Having recognized that, we have launched or revised new programs and courses in each of our four sites. At Viginia Tech, a new pathway called “LIKES” was introduced to the undergraduate general education curriculum. At Santa Clara University, a new course titled “Information Technology, Business, and Society” has been proposed as a required course of the 2009 new undergraduate core curriculum. At NCA&T, a new program named “Introduction to Web Science” is being developed. At Villanova University, a new course called “The Laptop Instrument” was launched to combine computer science and music disciplines. The fourth LIKES workshop is scheduled

for March 2009 at Villanova University. All of the participants have interest in achieving the LIKES goals and objectives. Yet, much work is needed. Some of the challenges identified at the workshops include:

- Archiving limitations (especially in subjects such as history)
- Deep understanding and ability to match abstractions with problems in various contexts through modeling/using
- Enticing faculty to incorporate computational thinking and to collaborate with each other (especially in the arts and humanities)
- Information literacy and critical thinking regarding technology
- Lack of research support (e.g., funding, etc.)
- Limitations in software tools and their use – visualization/simulation for large classes, lack of tools for specific purposes, disconnect between humanity's needs and the developers of the tools (making usable tools)
- Moving from massive amount of data to hypothesis generation to testing
- Preparing students for scholarship and work in collaborative environments
- Spreading LIKES to other disciplines and implementing LIKES processes in terms of maintainability (e.g., incorporation of new computing concepts dynamically – supercomputing/grid computing/cloud computing)

4. CONCLUSION

Since the LIKES project has a strong synergy with the building of the iField, we believe that a discussion between the LIKES team and i-Conference attendees would beneficially impact both the efforts of LIKES and the iSchools. Our poster will highlight our common interests, challenges, and plans. The poster also will detail accomplishments at the four LIKES sites, and what lessons

have been learned to date. Some of those might be directly applicable at iSchools, or help in iSchool outreach activities.

It is our belief that we need knowledge in both computing as well as information areas to understand deeply and get prepared for the emerging Knowledge Society or iField. We look forward to working together with interested iSchools.

ACKNOWLEDGEMENTS

This project was funded by the NSF grant nos. CCF-0722259, 0722276, 0722289 and 0752865.

REFERENCES

- [1] iSchools Caucus. (2008). Who are the iSchools? Retrieved November 27, 2008, from <http://www.org/oc/.html>.
- [2] The Living In the KnowlEdge Society Project homepage. Retrieved November 27, 2008, from <http://www.livingknowledgesociety.org>.
- [3] An Interview with Ron Larson about iSchools, presented by CNI (2005). Retrieved November 27, 2008, from <http://connect.educause.edu/blog/mpasiewicz/aninterviewwithronlarsena/1717?>
- [4] Mal Schwartz. (2008). Group of Leading Colleges Launch Major Effort to Put The Information Field "On The Map", press release from MBS Associates, Montrose, NY. Retrieved November 28, 2008 from <http://www.mbsa.info/resources/Putting%20iField%20on%20the%20Map%20Announcement%20081407%20final.pdf>.
- [5] NSF. (2006). CISE Pathways to Revitalized Undergraduate Computing Education (CPATH). US National Science Foundation Program Solicitation NSF 06-608. Arlington, VA. Retrieved 2006-2006 from <http://www.nsf.gov/pubs/2006/nsf06608/nsf06608.htm>