

Proposal for Creation of a School of Computing and Information Science

Part I Detailed Description of the Proposed Unit Reorganization

0. Preamble

Computing and information science are emerging as key disciplines of the 21st Century. The proposed school will enable the University of Maine to better position itself in this vital area. It will reorganize several small academic units within a larger unit that can more effectively offer the academic degree programs and graduates needed by Maine and the Nation and better advance knowledge and research in the field.

The University has a dire need to stabilize its programs in computing and information science. There has been substantial diminishment of resources for programs in computing and information science and persistent threats against their continued existence. This is occurring at the same time that industry in Maine and beyond has continually cried out for increased numbers of graduates in these fields. The Chancellor in his most recent address to the Maine Legislature (March 30, 2011) has stressed the importance of such degree programs across all industry sectors and localities in Maine and the need to double the number of graduates in these areas within four years. The following reorganization proposal will help stabilize these continually threatened programs and reposition them to expand, grow and better serve the pressing needs of the State and Nation.

1. Description of Reorganization

This proposal will create a *School of Computing and Information Science* that includes the faculty, students and academic degree programs currently affiliated with *Computer Science* and *Spatial Information Science and Engineering*. Cooperating faculty arrangements among disciplinary faculty clusters within the School as well as with faculty external to the School will be highly encouraged. After the School has gained experience with cooperating faculty, the Administration will consider a detailed plan for a distinguished level of cooperating faculty, to be called a member, with members having joint appointments with the School and their home units.

Structure

- A) The School will be formed by the merger of the Department of Spatial Information Science and Engineering with the Department of Computer Science.
 - i. The salary lines, operating budgets, existing and promised start-up funds, endowments, gift accounts and other resources of these two units in their entirety will be merged in the new School.
 - ii. The School will reside in the College of Liberal Arts and Sciences and will report to the Dean of that College.
 - iii. The School will have a single Director, a single Policy Advisory Committee, and a

- single Peer Committee.
 - iv. Faculty will continue to be reviewed under the Promotion and Tenure Guidelines of their original departments unless they opt to be reviewed by any new criteria produced by the School. Faculty may opt for new School related titles or keep their original affiliations including for any future promotions.
 - v. All office, building, facility space, labs and equipment currently affiliated with the constituent units will be retained by these units but will now be administered through the School.
 - vi. All existing degree, minor and certificate programs will continue and be administered by appropriate disciplinary faculty clusters to be set up within the School. Initially, these disciplinary faculty clusters will consist of the people currently administering the degrees, minors and certificates.
 - vii. The two disciplinary faculty clusters described below will have authority over the curriculum for the academic degrees, minors and certificate programs affiliated with the cluster. They will also have the lead responsibility over course teaching assignments and will play an active role in the accreditation processes for their degree programs and in recruiting. Faculty in each cluster will be highly encouraged to offer or adapt their courses to meet the needs of multiple academic degree programs within the School and across the university.
 - viii. The School may appoint Discipline Coordinators for the different disciplinary faculty clusters; these individuals will be part of the internal organization of the School and will report to the Director. Current department chairs will serve as the Discipline Coordinators for the duration of their current terms. Once their current terms expire they will be subject to whatever procedure is set in place for the selection of Discipline Coordinators.
 - ix. Through time and depending on the performance of the School, additions to the School may be considered by either internal transfer or new appointment.
- B) The initial disciplinary faculty clusters and affiliated degree and certificate programs within the School of Computing and Information Science shall consist of:
- i) Computer Science Faculty (7 faculty members)
 - a) BA – Computer Science
 - b) BS – Computer Science
 - c) MS - Computer Science
 - d) PhD - Computer Science
 - ii) Spatial Information Science and Engineering Faculty (7 faculty members)
 - a) Graduate Certificate in Geographic Information Systems
 - b) Graduate Certificate in Information Systems
 - c) MS - Information Systems
 - d) MS - Spatial Information Science and Engineering
 - e) PhD - Spatial Information Science and Engineering
- C) For choosing the Director of the School, the usual procedure for choosing unit heads will be used.

D) Faculty members shall be encouraged to list their University affiliation following the pattern of *Computer Science Faculty, School of Computing and Information Science*.

Name of School

The name of the School shall be the School of Computing and Information Science.

Impact on Academic Programs at UMaine

- A) There are no academic degree program creations or eliminations affiliated with this reorganization proposal.
- B) The new School and the disciplinary faculty clusters within it will continue to teach all courses required for any existing accreditations. Any future changes will be made taking accreditation issues into account.
- C) For individual cooperating faculty and potential future *members* that have their homes with other campus units, the intent of the reorganization is to create a win-win situation allowing cooperating faculty and their programs to be located strategically at the interdisciplinary interface between their home program and *computer and information science* providing increased opportunities for joint research funding, interdisciplinary teaching, and enhanced visibility for the cooperating faculty and their programs and students.

2. Rationale for the Proposed Reorganization

The programs being brought together under the *School of Computing and Information Science* have been severely affected by cutbacks in university financial support over the past decade to the point where there is a critical need to reorganize in order to allow the programs to better serve students and thus better respond to priority needs of the State and Nation.

Expected Benefits for Students

A major objective of the involved academic degree programs is to provide a path for women and men from diverse backgrounds to rapidly transition to computing and information system career paths by providing them with foundation and advanced undergraduate and graduate level courses in computing and information science.

By bringing together the leading information technology degree programs on campus within a single School, students will gain better exposure to more and wider ranging aspects of computing and information science. They will have greater flexibility in shifting among programs because more courses are likely to become common among programs as interdependencies among the degree programs grow over time. Students will also have greater flexibility in transitioning to graduate programs within any of the academic domains encompassed by the School. Students will gain from the enhanced visibility and competitiveness of a single school with its expanded ability to recruit students, expand research funding and provide internships with Maine

businesses and beyond. All of these benefits come about through increased efficiencies as a result of having closely aligned academic degree programs within the same administrative unit and forging closer relationships campus-wide through formal cooperative status arrangements.

From a student perspective, information technology and systems professionals are well rewarded for their skills with high starting salaries here in Maine and elsewhere.¹ It is no coincidence, for example, that the "Best Job In America" is not physician or lawyer. It is "Information Technology Systems Engineer" according to a recent study of thousands of jobs assessed across multiple criteria with the goal of identifying the Best Jobs in America now and in the future.² Many of the listed best jobs in the nation are in the IT field and require graduates with high level computing and information system skill credentials: the fact that many have "Systems" in the job title speaks volumes. The evidence is clear. The information technology skills provided through the School's undergraduate and graduate courses and programs are and will continue to remain in high demand both across the nation as well as in Maine.

Expected Benefits for Faculty

Faculty will gain by being able to regularly meet with and work hand-in-hand with faculty and students in closely interrelated disciplines. This should allow greater ease in submitting and receiving multidisciplinary research proposals, ease the ability to team-teach or teach across programs in the School, ease the ability to cross list courses and generally lessen the burden for everyone in accomplishing such tasks as recruitment, managing web sites, and maintaining labs and equipment. For cooperating faculty and cooperating faculty clusters, credit through visibility may be given for productivity both in the home department and on the web site and in outreach literature of the *School of Computing and Information Science*.

Expected Benefits for the University of Maine

The reorganization is largely budget-neutral at the University level. While no substantial immediate financial savings will be gained by bringing the several degree programs under a single School, the University gains by enabling increased efficiencies in operations. It also gains by having faculty numbers at a critical mass such that the academic degree programs are much better positioned to increase student numbers in all of the programs over time. We also believe some of the degree programs in the School, particularly at the graduate level, will provide strong exemplars of how a full slate of regularly taught on-campus courses may be readily delivered at a distance with minimal additional effort on the part of faculty.

In study after study, information technologies have been identified as critical to advancing the well being of the State of Maine and the nation. The University of Maine and the State deserve a unified teaching, scholarly advancement and research environment that will allow computing and information science to excel on the campus and beyond.

¹ Top 10 Fastest-Growing Maine IT Occupations, <http://www.techmaine.com/careers-and-education#top10>

² Best Jobs in America, <http://www.umaine.edu/spatial/blog/2010/03/17/best-jobs-in-america/>

Expected Benefits for the State of Maine and the Nation

The future business climate in Maine and the rest of the nation will be characterized by rapid technological change, intense global competition, faster product life cycles and more complex, specialized markets. In such an environment the computing and information needs of organizations are increasingly complex and rapidly changing. Individuals with computing and information systems expertise who can design and develop computer and information technology products, design and develop information systems, manage sophisticated information resources, work on interdisciplinary teams and communicate effectively with business managers, engineers and other end-users are in short supply.

“Any company that manages lots of data, including hospitals, banks, insurance firms and retailers, needs technology workers.”³ Every economic and job study accomplished in the State of Maine over the past several decades has indicated that highly skilled information technology workers are in short supply and will continue to be in high demand in Maine and across the nation. Industry is looking for people who understand information technology and systems as a whole: front end design, back end operation, enterprise-wide information systems management. These are the overall systems on which small and large enterprises alike depend for their operation in today's digital age. Even a cursory look at job listings on the TechMaine web site⁴ indicates that Maine businesses are in constant need of information systems professionals. Maine has a substantial number of information technology employers actively looking for information technology professionals⁵ and many are interested in providing internships for our graduate students.⁶ This same high demand is witnessed across the nation.

The academic programs to be brought together under this School have been suggested for inclusion in Maine's high-demand workforce areas in a report issued by the University of Maine System on *Advancing Maine: An Action Plan to Transform Maine's Economy*.⁷ There are numerous reports documenting the importance of each individual field as well. For example, geospatial technologies have been identified specifically as a *High Growth Industry* by the US Department of Labor.⁸

A major goal of the academic degree programs brought together in the new school is to produce individuals who can make significant contributions to economic development by ensuring that private and public enterprise have the expertise needed to remain competitive.

3. Potential Impacts

³ Technology Sector Remains Upbeat About Job Growth, 2011, National Public Radio, <http://www.npr.org/templates/story/story.php?storyId=122298649>

⁴ Technology Jobs, Technology Association of Maine, <http://www.techmaine.com/technology-jobs>

⁵ Technology Employers Directory, <http://www.techmaine.com/employer-directory>

⁶ Company and Agency Internships, <http://spatial.umaine.edu/internships/>

⁷ Advancing Maine, The University of Maine System – A Key Economic Driver for Maine, <http://www.maine.edu/system/AdvancingMaine.php> (draft 9.10.10)

⁸ High Growth Industry Profile: Geospatial Technology, U.S. Department of Labor, http://www.doleta.gov/brg/Indprof/geospatial_profile.cfm

The total E&G budget for Computer Science to be transferred to the new school would include the funds for seven faculty members. Also transferred would be the support staff funding for the administrative assistant and technician. The current operating budget would be transferred in entirety as well as any department gift account money. Also transferred would be any and all funds for course and lab fees paid by computer science students at both the undergraduate and graduate levels.

The total E&G budget for Spatial Information Science and Engineering to be transferred to the new school would include the funds for seven faculty members. Also transferred would be the support staff funding for the administrative assistant. The current operating budget would be transferred in entirety as well as any department gift account money. All contractual agreements such as for start-up funds will continue to be honored. Also transferred would be any and all funds for course and lab fees paid by Information System, Geographic Information System and Spatial Information Science and Engineering students.

Within the *School of Computing and Information Science* there will be no transfer of faculty positions between the disciplinary faculty clusters. One of the current administrative assistants might deal primarily with the School's undergraduate programs while the other might deal primarily with the graduate programs.

The *College of Liberal Arts and Sciences* is expected to bear little in the way of additional expenses as a result of the restructuring because one of the units is already being administered under this school and the added program will be bringing along or maintaining the faculty, staff and support budgets they already claim.

Three and Five Year Predictions for Faculty and Support Budget of the Reorganized Unit
Unless economic conditions change drastically, the *School of Computing and Information Science* is expected to have approximately the same number of faculty positions allotted to the reorganized unit in three and five years as it will have upon its initial creation. If the new critical mass of faculty created by this reorganization is able to bring in increased research funding, there is potential for creating post-doctoral positions to support both teaching and research activities but these would be temporary typically. Because the largest portion of the budget goes to faculty lines, similarly one would expect very little change in the university's budget allocation to this unit three and five years out.

4. Timing for Implementation

If approved prior to the summer of 2011, we envision that the new school could be operating as a new unit in September of 2011. There would be no physical movement or transfer of any facilities, offices or equipment within the near future. As such, the primary tasks needed to implement a new school will involve selecting a head of school, transferring the budgets from the *Department of Computer Science* and *Department of Spatial Information Science and Engineering* to within the single school, ensuring that commitments and contracts to faculty, staff and students that are transitioned into a new College are honored, ensuring that course and lab fees continue in effect, revising the official university catalog on the university web site,

creating a School web site and revising the web pages of the participating programs. From the perspective of the involved faculty, this is all achievable within a short period of time.

Part II. Supportive and Non-Supportive Considerations

1. Criteria Supporting Reorganization

A) On a national and international level, the disciplinary domain has changed.

Across the nation and the globe, computing and information system skills have emerged as critical in helping to advance knowledge in most other scientific domains. This is true as well across government and industry. It makes sense that the core academic fields for advancing knowledge in information technology should also become interdisciplinary under common academic administrative units. This has been happening across the world. By example, if one views the World List of Schools and Departments of Information Science⁹, it is obvious that most schools are no longer limited to one narrow computing or information science field. Although not yet common, it is not unusual to see leading researchers in computer science, spatial computing and information systems working closely with each other on interdisciplinary teams at leading universities. In fact, this reorganization will give Maine a competitive advantage by illustrating that we are already working within interdisciplinary faculty teams in advancing the knowledge of our respective disciplines.

B) The reorganization will better serve the strategic focus of The University of Maine.

As noted previously, all of the computing and information programs affiliated with the School have been identified as high priorities for the economic advancement of the State of Maine. Yet until now our degree and research programs have been thinly spread across campus. The new School will allow us to have much more focus in pursuing opportunities with funding agencies and in working with industry and businesses. The visibility and identity of the School should better convince sources of support that we have the critical mass of faculty and scholarly resources available to the achieve excellence when pursuing goals and objectives as set forth in our proposals.

C) The proposed reorganization provides a competitive advantage to the unit.

A major reason expressed by many of the faculty interested in joining the unit is indeed the enhanced competitive advantage that being affiliated with a larger unit will provide. Most of the programs around the nation for which we compete for students and grants are much larger than our current department or program units at the University of Maine. Being able to list on the web site a larger combined faculty, student profiles, student projects, research projects, labs and similar resources will allow our faculty and students to point at the clearly evident range of computing and information science expertise available on the campus.

⁹ World List of Schools and Departments of Information Science, <http://informationr.net/wl/>

F) The programs have a substantial similarity or affinity of objectives such that the economics of operation or improvement in quality may reasonably be expected from their consolidation.

With a core group of faculty pursuing closely related and interrelated research and teaching we expect interdisciplinary perspectives offered across this greater pool of faculty to enhance diversity of learning for students. Moving across courses and experiences is eased through administration under a single school. Better learning will result at both the undergraduate and graduate levels from exposure to greater numbers of views and perspectives that will inherently be offered across the interrelated computing and information scholarly domains.

J) Budgetary constraints suggest reorganization of the programs within a school or college.

Budget stresses across the University have resulted in dwindling resources to the extent that viable competitive programs are extremely difficult to maintain. Operating budgets for both of the programs to be brought under the School are largely non-existent with faculty using innovative means to self-generate additional resources to run some day-to-day operations to serve their teaching and research needs. Salary lines have been severely curtailed as well. As an example, Computer Science has dwindled from 10.5 to 7 positions as a result of budget curtailments. In comparison, University of Vermont currently has about 25 positions, University of New Hampshire about 30, University of Connecticut about 20, and University of Massachusetts over 60. While this School proposal will not bring us to comparable levels of faculty support the creation of the School will help create a critical mass in computing and information generally. Note that the initial starting configuration for the School would have 14 faculty positions and that is still small but would be a substantial step in the right direction.

2. Criteria Contraindicating Reorganization

A) The reorganization is sufficiently uncommon within higher education so as to render difficulty in recruitment and retention of quality students and faculty.

As documented above, the reverse is true (See Part I, Sections 1, 2 & 5). Schools of Information Science and Computing are prolific across the nation and globe and Maine students deserve to have access to the quality and depth of exposure in computing and information that will allow them to thrive in the information economy. Having a recognizable school in computing and information science will greatly enhance the ability to recruit and retain students and faculty across all of the degree and research programs to be offered in the School.

B) The reorganization might endanger the quality and/or accreditation status, where applicable, of one or more of the programs affected.

The only possible accreditation concern is with that of the undergraduate degree program in Computer Science. Its students will now be within a larger unit with expanded faculty and resources upon which to draw. Thus, accreditation standing appears to be greatly enhanced overall for this program due to the proposed reorganization.

C) The programs, though dealing with similar subject matter, may be substantially different in orientation, objective, or clientele.

The contrary is true (See Part II, Section 1. F). While the programs are different in orientation as reflected in the different degree programs offered, all have sufficient content and subject matter in common to result in an environment where computing and information scholarship and research should thrive. Undergraduate students will have greater opportunity and flexibility in learning about work across all of the graduate programs in the School and thus are more likely to find a match in Maine in pursuing their graduate degrees. Thus common approaches and at least some overlapping subject material among Computer Science, Information Systems and Spatial Information Science and Engineering bode well for a mutually supportive and beneficial School.

D) The cost reduction of reorganization may be so modest as to make such reorganization rather pointless if cost savings is the primary objective.

As noted above, the reorganization is not primarily focused on cost reduction. The reorganization is largely budget-neutral at the University level. The goal is to create a critical mass of faculty and students to allow existing programs to survive, thrive and generate new opportunities for both the University and the State.

E) The program's reorganization may have a substantially negative impact on education and societal concerns to Maine.

To the contrary, the reorganization would provide visibility for and allow the school to be more effective and responding to well-documented high priority education and economic needs of the State (See Part I, Section 2).

F) The program's reorganization may have a substantially negative impact on strategic goals of The University of Maine.

To the contrary, it would help the University of Maine achieve its long-term sustainability goals by making critically important degree programs more viable and sustainable through consolidation under a single School.

G) The program's reorganization may result in substantial loss of revenue currently derived from grants, contracts, endowments or gifts.

To the contrary, the reverse is likely to result both in terms of research funding (as documented above) and in terms of donations. We expect the reorganization to energize and excite the large and growing constituency of computing and information professionals spread across wide-ranging industries within the State of Maine and beyond.