Academic Program Review
Department of Computer Science
Faculty of Engineering
University of Victoria

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Executive Summary

On February 13 and 14, we engaged in meetings with senior administration, deans, department leaders, as well as graduate and undergraduate students to gather information to complement the Department of Computer Science self-study document, in order to create a summary academic review (the itinerary of meetings is attached as an Appendix). This was the first external review of the Department since July 2007.

We were generally impressed with the transparency and frankness of all of our discussions, which we believe has facilitated an easy consensus on the overall position of the Department, its central-- even crucial--role in the University, and a relatively straightforward identification of strengths and weaknesses leading to our recommendations on a path forward. However, we cannot overstate the need for relatively quick action, and clearer alignment of Department, Faculty, and University strategic priorities. As noted in our recommendations at the end of this report, there seem to be suitable resources and a positive desire to move the Department to a more sustainable role within the Faculty and University.

Major strengths

The Department has significant academic strengths in several research areas, as well as strong and diverse undergraduate programs. Its gender balance ratio for female faculty members is also among the best in Canada. Well-established research strengths are in theoretical computer science and software engineering. In case of the latter, it is one of the few departments in Canada that has successfully navigated the creation of a software engineering program that manages the cultural tensions between professional engineering accreditation and CS content. Nonetheless, as noted below, addressing the challenge of engineering accreditation program does have administrative and resource impacts.

Over the last 15 years, the Department has embraced BC's provincial program to increase enrolment in CS (i.e., Double the Opportunity, or "DTO"), even when that government program was "late" relative to the window of opportunity created by the

industrial demand in the early 2000s. Because of this program lateness, the Department faced the challenge of declining enrolment for CS majors. Department leaders worked very hard to build relationships elsewhere across campus, to create joint programs with a number of other academic units. These efforts led to not just meeting but far surpassing the DTO goals in terms of undergraduate registrants. This success has created one major area of concern, namely a teaching load that is significantly higher than other comparable units across the entire university. We note that the departmental self-study document, and many of our on-site discussions, did not fully recognize the significant adverse impacts of the current student teaching load.

Areas of concern

Our summary of areas for concern articulates both the symptoms and what we speculate to be the causes, so that we can more accurately provide recommendations that will help address those concerns. The primary concern is about how high the teaching loads have become, as a result of the broad university engagement to create joint programs with CS. In particular, the table of Equivalent Enrolments Taught (EET) and Full Time Equivalents (FTE) on pages 36-37 of the self-study indicate that the Department has a load of 36.4, which far exceeds the next highest in Engineering (21.2), and is well above the University average of 22.6. This is the primary area of concern because it has negative impacts on morale, the ability to recruit and retain highly talented faculty, and the strategic direction of the department as a whole. In short, they have been burdened by their own success in joint programs.

A second area of concern is about the potential of missing significant program opportunities because of deficient resources, especially people resources. Specifically, the Department needs to exploit the demand for both educational content and research in the emerging area of Data Science. A significant demand for the development of curricula and research programs in Data Science does not need to compromise the Department's current multi-disciplinary programs, but rather provides the basis for a new engagement model that puts CS at the centre rather than at the periphery of program delivery and management. This kind of activity has been successful in many other Canadian Universities (e.g., UBC, Dalhousie), but the opportunity will be lost if there are not sufficient energy, enthusiasm, and people resources to guide the development of a strategic plan for Data Science, driven by Computer Science.

Future directions

The most important thing for the future is to address the teaching load, to both preserve the integrity of the department's strong research profile, and to ensure that opportunities like that presented by Data Science are not lost. Such challenges always revert to the availability of resources, but there seems to be a practical solution to the identification of such resources, if the appropriate strategy and

consensus therein can be confirmed. One key recommendation is to use a significant number of the planned faculty hires to recruit strong teaching faculty to complement those that have already been hired. More teaching faculty will help not only relieve the overall teaching loads, but also address the concerns of research faculty about encroachment on their research capacity (e.g., reduction in research topics courses, increase in cross-listed ugrad/grad courses, reduced time and energy for individual research programs).

Overall, the Department's responses to the DTO program during an era of declining CS enrolments was innovative and constructive, and have led to many excellent opportunities for students in these inter-disciplinary programs. In this regard, it must be judged as extremely successful. However, in part because of that success, they find themselves in quite a different position, with unsustainable class sizes that are eroding their capacity to teach their core courses, to offer a range of specialized courses of in support of the research interests of faculty, and to pursue new areas of interest and demand.

As already noted, there has not been a strategic review for some time, and it is now time-critical to establish strategic consensus at the Department, Faculty, and University levels, and create a long-term sustainable strategy to address these major issues.