In spring 1998, the Computing Research Association conducted a survey of U.S. and Canadian Ph.D. granting departments of computer science and engineering to collect data on budget, staff support, space, faculty teaching loads, and graduate student support. The survey asked for data for the most recent annual period for which the data were available. In most cases this meant the period from July 1, 1996 to June 30, 1997. The results of the survey were reported in a workshop at the 1998 CRA Conference at Snowbird.

The survey was sent to 186 Ph.D. granting programs in computer science and engineering. The response rate for U.S. programs was 52%, with 89 out of 170 programs responding. The response rate for the Canadian programs was 50%, where 8 out of 16 programs responded.

When analyzing the results of the survey, we divided the U.S. programs into four groups according to the most recent NRC ranking: CS departments ranked 1 - 12 (7 responses), CS departments ranked 13 - 24 (9 responses), CS departments ranked 25 - 36 (9 responses), and CS departments ranked 37 or higher (60 responses including 4 not ranked by the N.R.C.). In a different analysis, we divided the U.S. computer science and computer engineering programs into public (65 responses) or private (24 responses) institutions.

Some departments responding to the survey did not provide answers to all the questions. However, the proportion of missing values was small, only sporadically exceeding 10%. We believe these response rates are sufficient for the aggregate results of the survey presented below, to be meaningful.

The survey also asked about the structure of the budget. These data are summarized in Table 4. The data show that external funding plays a smaller role in the budgets of the Canadian programs compared with the U.S. Similarly, the proportion of the budget that comes from external funds in the U.S. departments ranked up and is lower in the programs ranked 1 – 36.

Table 5 presents the average ratio of annual departmental expenditures for instructional and research laboratories to the number of FTE faculty (in thousands of U.S. dollars). These expenditures include maintenance costs.
Space

The survey asked about use of space in the departments. We found no clear trends as a function of type (public vs. private), ranking, or country. We thus report the average space use over all responses. The results are shown in Figure 1 below. The survey indicates significant activity with respect to added or forthcoming space allocated to U.S. computer science departments. Out of 89 U.S. departments, 21 reported acquiring new space in the past year. The amount of new space ranged widely (minimum 41 sq. ft., maximum 8,690 sq. ft.). Five departments reported loss of space.

Twenty-five U.S. departments reported renovation of existing space. The scope of renovation differed substantially among programs (minimum 260 sq. ft., median 1,912 sq. ft., maximum 10,000 sq. ft.). The survey asked respondents to indicate funding sources for the newly acquired or renovated space. The results are shown in Table 9. Institutional and state funding were listed most often by far, with federal, industrial, and private funding being mentioned only sporadically.

A summary as 13 U.S. departments expect new space to become available to them by 2005. Of these, 26 (79%) expect new space by the end of 2000. The departments are rather optimistic about timely delivery of the new space. Over 60% expect it to be available on time or expect it is likely to be available on time. Once again, institutional and state sources are the two most commonly listed (Table 9).

Table 10 presents the ratio of the total departmental space available to the number of FTI faculty. The total departmental space consists of faculty, staff, and graduate student offices, conference and seminar rooms, and research and instructional laboratories operated by the department. There is little difference between the U.S. and Canada, and little difference between U.S. private and public institutions. However, there are significant differences between top-ranked U.S. departments and those ranked 37 and higher. The departments ranked 1 – 12 report almost twice as much space per FTI (1,801 sq. ft.) as those departments ranked 37 and up (946 sq. ft.). U.S. or the planned space is similar to the use of the space currently available to the programs. However, there appears to be a greater emphasis on laboratory space, with half of the planned space allocated to research and instructional labs (Figure 2 below).

Too few responses were received from the Canadian departments about recently acquired, renovated, or planned space to report aggregate statistics. Out of 8 Canadian departments responding, two reported a gain of new space and one reported a loss of space. Two Canadian departments reported renovation of some of the existing space during the reporting period. Finally, three Canadian departments expect new space by the end of 2005.

Teaching loads

Data submitted from departments using the quarter system were converted to semesters, using the following conversion: 1 quarter = 330 teaching hours.

Survey from Page 6

Profiles Survey
Course load = 0.67 semester courses. A n official teaching load of 3 semester courses per year was reported by 33% of the respondents, and an additional 31% reported an official teaching load of 4 semester courses per year. The minimum reported was 0.67 and the maximum reported was 8.

Table 11 on page 7 presents the average official teaching loads. Teaching loads are correlated with the rank. In particular, official teaching loads in departments ranked 1-36 are about 50% lower than in departments ranked 37 and higher. Teaching loads reported by programs at private universities are about 20% lower than those reported by departments at public institutions. A dual teaching loads reported are generally lower than official loads. However, due to technical problems with the survey form, the data on actual teaching loads are not reliable and will not be reported.

The survey form, the data on actual teaching loads are not reliable and will not be reported.

Graduate student support

One of the goals of the survey was to determine typical work requirements for teaching and research assistants. We found that for 78% of the U.S. programs, the standard work requirement for a TA is 20 hours/week, with the mean being close to 20 hours/week for all classes of programs. In contrast, the Canadian respondents report a mean standard work requirement for a TA of only 12 hours/week. The results in Table 12 also show that teaching assistantship stipends are slightly lower for graduate students and faculty than for research assistants and faculty.

The mean standard work requirement for an RA reported by the Canadian programs was 17.6 hours/week. The survey asked for the net value of stipends (stipend for a nine-month assignment minus stipend for assistantship and fees for teaching assistants, research assistants, and fellowship holders). Since there was significant variability in the reported stipends, we decided to report the median stipend value, which was $3,322 for the median stipend values in the reported data. The median net stipends are shown in Table 12. The results show that there are no significant differences in net stipends among different categories of programs. However, teaching and research assistantship stipends reported by the Canadian programs are substantially lower (by about 40%) than those reported by the U.S. institutions. The results in Table 12 also show that teaching assistantship stipends are slightly lower for graduate students and faculty than for research assistants and faculty.

Graduate Student Support

Survey from Page 7

Profiles Survey

Research Priorities

The bulk of the report concentrates on four research priorities: software, scalability, high-end computing, and socio-economic and workforce impacts. A significant number of research programs reported 40% of U.S. programs and 65% of Canadian programs reported first-year stipend enhancements. G guaranteed multi-year support was reported by 51% of programs, with 44% guaranteeing support for 2 years and 16% of them guaranteeing support for 3 years. Paid visits to campus were reported as an incentive by 44% of programs, with a median amount per visit of $500 and a maximum of $1,000. Finally, guaranteed multi-year stipend support was reported by 28% of the programs. The median amount of summer support was $3,600 for a U.S. program and $3,322 and for a Canadian program.

Conclusions

The initial feedback from the Snowbird workshop where the results of the survey were presented indicated that such data are of great interest to computer science and computer engineering departments. It was a common sentiment that the survey needs to be conducted regularly every two or three years so as to provide meaningful data for the temporal analysis of changes in resources available to computer science and engineering programs.

At the same time, discussions at the workshop and e-mail correspondence indicated that this was limited, as readers interested in the results of the survey were not sufficient to the Board.

Acknowledgments

We would like to thank Larry Finkelstein, Chip M. Arid, and M. Diego Vardi for their help in developing the survey, Greg Adre's leadership, and encouragement throughout the whole project. We would also like to acknowledge the assistance obtained from the CRA staff, especially from Bill A. Wright, Jean Smith, and Stacy Cholewinski.

Finally, we would like to thank Lena Truszczynska for her help in analyzing the results of the survey.