



Committee for the Evaluation of Computer Science Study Programs

Bar Ilan University **Department of Computer Science** Evaluation Report

October 2013

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Chapter 1- Background

The Council for Higher Education (CHE) decided to evaluate study programs in the field of Computer Science during the academic year of 2012-2013.

Following the decision of the CHE, the Minister of Education, who serves ex officio as Chairperson of the CHE, appointed a Committee consisting of:

- Prof. Maurice Herlihy – Computer Science Department, Brown University, USA - Committee Chair
- Prof. Robert L. Constable - Computer Science Department , Cornell University, USA
- Prof. David Dobkin - Computer Science Department, Princeton University, USA¹
- Prof. Sarit Kraus - Department of Computer Science, Bar Ilan University, Israel²
- Prof. Dmitry Feichtner-Kozlov, Department of Mathematics, Bremen University, Germany
- Prof. Joe Turner, Jr. - (Emeritus) - Department of Computer Science, Clemson University, USA - ABET Representative
- Prof. Moshe Vardi - Department of Computer Science, Rice University, USA

Ms. Yael Herzstein served as the Coordinator of the Committee on behalf of the CHE.

Within the framework of its activity, the Committee was requested to:³

1. Examine the self-evaluation reports, submitted by the institutions that provide study programs in Computer Science, and to conduct on-site visits at those institutions.
2. Submit to the CHE an individual report on each of the evaluated academic units and study programs, including the Committee's findings and recommendations.

¹ Due to scheduling constraints, Prof. David Dobkin did not participate in the site visits to the Jerusalem College of Technology, Hadassah Academic College, and Ariel University.

² In accordance with the CHE's policy, Prof. Sarit Kraus did not participate in the evaluation of the Computer Science department at Bar Ilan University to prevent the appearance of a conflict of interests.

³ The Committee's letter of appointment is attached as **Appendix 1**.

3. Submit to the CHE a general report regarding the examined field of study within the Israeli system of higher education including recommendations for standards in the evaluated field of study.

The entire process was conducted in accordance with the CHE's Guidelines for Self-Evaluation of (October 2011).

Chapter 2-Committee Procedures

The Committee held its first meetings on May 21, 2013, during which it discussed fundamental issues concerning higher education in Israel, the quality assessment activity, as well as Computer Science Study programs in Israel.

In May - June 2013, the Committee held its visits of evaluation, and visited Ariel University, Bar Ilan University, the Hadassah Academic College, Jerusalem College of Technology and Tel Aviv University. During the visits, the Committee met with various stakeholders at the institutions, including management, faculty, staff, and students.

This report deals with the Department of Computer Science at Bar Ilan University. The Committee's visit to the University took place on May 26-27, 2013.

The schedule of the visit is attached as **Appendix 2**.

The Committee thanks the management of Bar Ilan University and the Department of Computer Science for their self-evaluation report and for their hospitality towards the committee during its visit at the institution.

Chapter 3: Evaluation of Computer Science Study Program at Bar Ilan University

This Report relates to the situation current at the time of the visit to the institution, and does not take account of any subsequent changes. The Report records the conclusions reached by the Evaluation Committee based on the documentation provided by the institution, information gained through interviews, discussion and observation as well as other information available to the Committee.

1. Executive Summary

Computer science is central to the Israeli economy and even to its security. Among winners of the Turing award (generally considered as the “Nobel Prize” for computer scientists), there are more Israelis than from all but one other country.

The Bar-Ilan computer science department makes a unique contribution to the strengths of Israeli computer science, and is a top-tier department in international rankings, and one of the best departments in the university. Nevertheless, there are several critical issues that must be addressed if this status is to be maintained.

The department and university have made substantial improvements in department quality by reducing enrollments and by increasing faculty size.

Nevertheless, the department maintains its world-class reputation without adequate physical and financial resources. A department of this quality in a field of this importance must be made a university priority. This has not happened. Against all odds, the computer science department has done extremely well, but because leadership in this discipline is central to the excellence of Bar-Ilan University as a whole, decisive action is needed.

2. Organizational Structure

Observation and findings

Many resource allocation questions seem to be settled on an ad-hoc basis, by individual negotiation, rather than by formal policies. This is counterproductive and inefficient for both faculty and administration. Both academic staff and administration must spend considerable time and energy on such negotiations, and the resulting *ad hoc* arrangements are sometimes inefficient ways to allocate scarce resources.

The department does not have an industrial affiliates program. This can be a good source of financial support.

Recommendations

Short term [~ within 1 year]:

- a. Within a year, the department should establish an industrial affiliates program.
- b. Within a year, the administration and the department must agree on standard policies governing resource allocation, especially for new faculty.

3. Mission and Goals

Observation and findings

The committee is pleased that the department has strengthened its research efforts in experimental computer science, as recommended by the 2006 review report. The committee is convinced that much of modern computer science is experimental in nature, and that this area is growing in importance, and is a natural area where Bar-Ilan could distinguish itself from other Israeli computer science departments.

Nevertheless, the university did not designate computer science as an experimental discipline, resulting in an underfunding of the department.

The university made a serious strategic error in failing to leverage the computer science department when starting the engineering school. Nevertheless, there is still an important opportunity to develop synergy, in both curriculum and research, between computer science and engineering.

The committee observes that the position of Dean of the Faculty of Exact Sciences has limited authority because of the short term of the position combined, with the lack of budgetary authority. We question whether this arrangement is conducive to effective academic administration.

Recommendations

Short term [~ within 1 year]:

- a. The university must recognize that much of computer science is experimental in nature, and ensure funding in the same way as other

experimental sciences and engineering. This activity must complete in a year.

- b. The university and the department must identify and implement ways to promote partnerships between computer science and engineering. This activity must complete in a year.

4. Study Programs

Observations and findings

The PhD program functions well and is consistent with international standards.

The undergraduate program has a reasonable balance between theory and practice. It is unclear the extent to which the curriculum design was aware of internationally-accepted models such as the ACM / IEEE-CS curricula.

Recommendations

Short term [~ within 1 year]:

- a. The department must develop and implement a system for tracking graduate student progress on an annual basis.

5. Human Resources / Faculty

Observation and findings

The ad-hoc nature of the hiring process makes long-range planning impossible. Negotiating whether a position exists only after choosing a candidate creates unnecessary uncertainty, and leads to short-term decisions.

A faculty of this caliber should have more international distinctions such as ACM, IEEE, and AAAS Fellow, Academia Europea, and similar distinctions. Such honors play an increasingly important role in international academic rankings.

To help new faculty adjust to the university, deal with the administration, and evaluate their career progress, the department needs a systematic way to assign mentors for new hires.

Recommendations

Short term [~ within 1 year]:

- a. Within the next year, the university and the department must work together to develop a five-year resource plan for the department.
- b. The department must institute an honors committee to promote nominations of faculty members for recognition such as ACM, IEEE, or AAAS Fellow and/or Academia Europea, or other international honors.
- c. The department must develop a mentoring program for new faculty hires.

6. Students

Observation and findings

The undergraduates were mostly happy, although there was discontent with the lab machines and the Internet connection.

The department must recognize that the MSc students are mostly working at outside jobs, which makes it difficult for them to attend classes and colloquia in the middle of the day.

The BSc students are generally happy, although there were complaints about the quality of the lab machines and the Internet connection.

The MSc. students reported being happy. There were some complaints about limited opportunity for interaction among the masters students, and about courses scheduled at times inconvenient for working students.

The department has no system for tracking graduate student progress on an annual basis. Such a system would help identify at-risk students, or students unlikely to finish, and would contribute to a more effective use of department resources.

The Ph.D. students were mostly happy, although there did not seem to be attempts to bring them together in a regular way. In departments at many universities, it is common for Ph.D. students to organize colloquia or social events.

Recommendations

Short term [~ within 1 year]:

- a. The department must devise and implement a structure where the Ph.D. students can meet on a regular basis. After the structure has been set up, it should be run by the students themselves.

7. Teaching and Learning Outcomes

Observation and findings

The teaching and learning outcomes stated are appropriate, but no systematic effort has been made to determine whether they have been achieved. The department should set in place a process to reflect on the attainment of outcomes in a planned, periodic manner.

8. Research

Observation and findings

The research quality is high.

Given its current strengths in empirical areas such as robotics and security, the department has the potential to distinguish itself among the other Israeli computer science departments in areas of experimental computer science.

The department is in a position to secure substantially more European funding. In addition to the financial benefits, such funding would enhance the department's prestige and visibility, making it easier to attract high-quality faculty and students.

Recommendations

Intermediate term [~ within 2-3 years]:

- a. The department must make a systematic and persistent effort to compete for European funding.
- b. The university must ensure that there is sufficient infrastructure to support a push for European funding.

9. **Infrastructure**

Observation and findings

The new research labs and the teaching facilities are adequate.

The absence of a common building damages the potential for intellectual interaction between different areas, and among researchers, and is damaging for the morale of the students. The lack of a building also puts the department at a significant competitive disadvantage in recruitment of staff and students. It is also unconscionable that senior faculty members share offices.

Recommendations

Short term [~ within 1 year]:

- a. The university must identify and implement a short-term remedy for the space crisis.

Intermediate term [~ within 2-3 years]:

- b. The university must identify and implement a long-term plan for a department building.

10. **Self-Evaluation Process**

Observations and findings

The process of writing the self-evaluation was not a collective self-assessment. The department should use the response to the recommendations as an opportunity for collective introspection, and to do the same for the self-evaluation report for the next visiting committee.

Recommendation

Short term [~ within 1 year]:

- a. Implementing the recommendations of the evaluation committee, must be a collective effort of the department.

Chapter4: Summary of Recommendations and Timetable

Short term [~ within 1 year]:

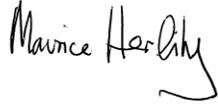
1. Within a year, the department should establish an industrial affiliates program.
2. Within a year, the administration and the department must agree on standard policies governing resource allocation, especially for new faculty.
3. The university must recognize that much of computer science is experimental in nature, and ensure funding in the same way as other experimental sciences and engineering. This activity must complete in a year.
4. The university and the department must identify and implement ways to promote partnerships between computer science and engineering. This activity must complete in a year.
5. The department must develop and implement a system for tracking graduate student progress on an annual basis.
6. Within the next year, the university and the department must work together to develop a five-year resource plan for the department.
7. The department must institute an honors committee to promote nominations of faculty members for recognition such as ACM, IEEE, or AAAS Fellow and/or Academia Europea, or other international honors.
8. The department must develop a mentoring program for new faculty hires.
9. The department must devise and implement a structure where the Ph.D. students can meet on a regular basis. After the structure has been set up, it should be run by the students themselves.
10. The university must identify and implement a short-term remedy for the space crisis.
11. Implementing the recommendations of the evaluation committee, must be a collective effort of the department.

Intermediate term [~ within 2-3 years]:

12. The department must make a systematic and persistent effort to compete for European funding.

13. The university must ensure that there is sufficient infrastructure to support a push for European funding.
14. The university must identify and implement a long-term plan for a department building.

Signed by:



Prof. Maurice Herlihy
Committee Chair



Robert L. Constable



Prof. David Dobkin



Prof. Dmitry Feichtner-Kozlov.



Prof. Joe Turner, Jr



Prof. Moshe Vardi

Appendix 1: Letter of Appointment



הוועדה לתכנון ותקצוב | Planning & Budgeting Committee

12.5.2013
Jerusalem

Professor Maurice Herlihy
Computer Science Department
Brown University
USA

Dear Professor Herlihy,

The Israeli Council for Higher Education (CHE) strives to ensure the continuing excellence and quality of Israeli higher education through a systematic evaluation process. By engaging upon this mission, the CHE seeks to enhance and ensure the quality of academic studies, provide the public with information regarding the quality of study programs in institutions of higher education throughout Israel, as well as ensure the continued integration of the Israeli system of higher education in the international academic arena.

As part of this most important endeavor we reach out to world-renowned scientists to help us meet the critical challenges confronting Israeli higher education by extending our invitation to participate in an international evaluation committee. This process represents an opportunity to assess the current state of the field and plan for the future. This systematic process of quality assessment also establishes a framework for the interactive consultative process taking place between scientists around the globe regarding common academic dilemmas.

It is with great pleasure that I hereby appoint you to serve as chair of the Council for Higher Education's Committee for the Evaluation of Computer Science. The composition of the Committee will be as follows: Professor Maurice Herlihy, Committee Chair, Professor Moshe Vardi, Professor (Emeritus) Joe Turner Jr., Professor Robert L. Constable, Professor Sarit Kraus, Professor David Dobkin, and Professor Dmitry Feichtner-Kozlov.

Ms. Yael Herzstein will coordinate the Committee's activities.

In your capacity as Chair of the Evaluation Committee, you will be requested to function in accordance with the enclosed appendix.

I deeply appreciate your willingness to join us in this crucial enterprise.

I wish you much success in your role as the Chair of this most important committee.

Sincerely,


Dr. Avital Stein
Director General,
The Council for Higher Education

Enclosures: Appendix to the Appointment Letter of Evaluation Committees

cc: Ms. Michal Neumann, The Quality Assessment Division
Ms. Yael Herzstein, Committee Coordinator

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Appendix 2: Site Visit Schedule

The Department of Computer Science– Schedule of Site Visit
Wednesday, May 26, 2013

Time	Subject	Participants
09:30-10:15	Opening session with the heads of the institution and the senior staff member appointed to deal with quality assessment	Prof. Haim Taitelbaum, Rector Prof. Miriam Faust, Vice-Rector In charge of Quality Evaluation
10:15-11:00	Meeting with the academic and administrative heads of the Faculty of Exact Science	Prof. Chaim N. Sukenik, Dean, Faculty of Exact Sciences
11:00-11:45	Meeting with the academic and administrative heads of the Department of Computer Sciences	Prof. Shmuel T. Klein, Head of the Department Computer Sciences
11:45-12:45	Meeting with senior academic staff (representatives of relevant committees)*	Dr. Ariel J. Frank Prof. Amihod Amir Prof. Amir Herzberg Dr. Liam Rodity Dr. Avinatan Hassidim Prof. Nathan Netanyahu Prof. Yehuda Lindell Dr. David Sarne Prof. Gal Kaminka
12:45-13:30	Lunch (in the same room)	
13:30-14:30	Tour of facilities: classrooms, library, labs, offices f *	Prof. Shmuel T. Klein, Head of the Department of Computer Sciences
14:30-15:15	Meeting with Junior academic staff	Mr. Rosenberg Amiad Ms. Ficler Jessica Ms. Zarosim Hila Dr. Ron Adany
15:15-16:00	Meeting with Adjunct academic staff	Dr. Omid David Dr. Oren Kapach Dr. Miri Ben-Nissan

Monday, May 27, 2013

Time	Subject	Participants
10:00-10:45	Meeting with BA students**	
10:45-11:30	Meeting with MA students**	
11:30-12:15	Meeting with PhD students**	
12:15-13:00	Meeting with Alumni**	
13:00-13:45	Lunch and closed-door meeting of the committee	In the same room
13:45-14:30	Summation meeting with head of Department	Prof. Shmuel T. Klein, chair of the Department Computer Sciences
14:30-15:15	Summation meeting with heads of Faculty and institution	Prof. Haim Taitelbaum, Rector Prof. Miriam Faust, Vice-Rector In charge of Quality Evaluation Prof. Chaim N. Sukenik, Dean, Faculty of Exact Sciences

* The heads of the institution and academic unit or their representatives will not attend these meetings.

*** The visit will be conducted in English with the exception of students who may speak in Hebrew and anyone else who feels unable to converse in English.