

**REPORT OF THE PROGRAM PERFORMANCE REVIEW TEAM**

**Master of Science in Computer Science**

**AY 2011-12**

**Bhushan Kapoor, Ph.D.**

Chair, PPR Review Team

Chair, Department of Information Systems/ Decision Sciences  
California State University, Fullerton

**Jane Oh, Ph.D.**

Principal Investigator at NASA

Jet propulsion laboratory, Pasadena

**Daisy Tang, Ph.D.**

Associate Professor, Computer Science

California State Polytechnic University, Pomona

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## Program Performance Review (PPR) Team Analysis

The report reflects the PPR team's assessment of the progress of the MS in Computer Science program in implementing the Department/ Program Mission, Goals and their alignment with the University mission, goals and strategies. The report is based on the information presented to the team in the 'self-study report of the MS in Computer Science for Program Performance Review', interviews with students, faculty, the chair of the department and the deans of the college during one day site visit on April 9, 2013:

08:30 a.m. Breakfast at the Marriott Hotel, Fullerton  
09:30 a.m. Review Team Meeting  
10:30 a.m. Department Chair, Dr. Shawn Wang  
11:00 a.m. Faculty – Dr. Kevin Wortman  
11:30 a.m. Faculty – Dr. Mariko Molodowitch  
11:45 a.m. Lunch at the Marriott Hotel, Fullerton  
1:00 p.m. Review Team Meeting  
1:30 p.m. Faculty – Dr. Christopher Ryu  
2:00 p.m. Associate Dean, Dr. Susan Barua  
2:30 p.m. Dean, Dr. Raman Unnikrishnan  
3:00 p.m. Faculty – Dr. Chang-Hyun Jo  
3:30 p.m. Student Group  
4:00 p.m. Department Chair, Dr. Shawn Wang  
4:30 p.m. Review Team Meeting

The Student Group included:

**James Clay** (MS'12, Part time instructor at Fullerton College, applying to Ph.D. programs)

**Wirawan Harjono** (MS'09, Analyst/Programmer IT, California State University, Fullerton)

**Vedant Majmundar** (MS'11, Software Application Engineer, Extron Electronics )

**Junyi Feng** (has completed 24 units and is working on the last 6 units, GPA 3.67)

**Yasmin Ehtesham** (has completed 12 units, GPA 4.0)

**Hernan Manabat** (has completed 9 units, GPA 3.2)

**Ali Rahama** (has taken 27 units and is working on the last 3 units, GPA 3.13)

### Program Strengths

The PPR review team lauds the Computer Science department chair, Dr. Shawn Wang and the department faculty for successfully running a large computer science graduate program and for its superior quality graduates who are sought after by the local employers. The team commends the dean Dr. Raman Unnikrishnan and the associate dean Dr. Susan Barua for their strategic leadership and direction in curriculum development and hiring. The team wants to

recognize and underscore the following specific features of the program, department, and the college:

1. The Program Mission and Goals are aligned with the University mission, goals and strategies.
2. The Department and the College provide a positive and collaborative environment to their faculty, staff and students.
3. The Department Curriculum committee, the chair, Dr. Shawn Wang and the associated dean, Dr. Susan Barua keep the program curriculum updated to ensure that their program prepares their graduates for an employment in the industry or advance to a Ph.D. program.
4. The Department has a well thought out long-term plan for the curriculum changes. They plan to develop special tracks in two more areas: **computer security** and **high performance computing**. With the universal extension in the utilization of Internet security and privacy have become a critical issue in every organization. Security must be dealt with in every section of the computing infrastructure. This led to a range of specialties, including hardware security, system security, network security, information security, mobile device security, and security policies. We have hired a new faculty member in security. High performance computing is another emerging area. Over the years it has also developed into many specialties, including parallel computing, cluster computing, grid computing, and cloud computing. Due to the enormous amount of data accumulated everywhere, high performance computing systems are essential to get useful information from the data. We are in the process of hiring a new faculty member in this area.
5. Dedication of the chair and faculty members.
6. Most tenured and tenure-track faculty members keep themselves most updated and actively participate in research.
7. Graduate faculty has opportunity to participate in technological developments in their areas of expertise.
8. Part-time faculty is carefully selected from the local high tech companies.
9. The program provides students a perfect blend of practice, theory and research.
10. The department has sufficient modern computer labs equipped with most current hardware and software.
11. The Department provides a variety of flexible class schedules, including evening classes, weekend, and online classes.
12. The Department provides services in all aspects of a student-learning environment. One faculty member is designated for student advising and the faculty gets a 3-units assigned time for this responsibility, but other faculty members happily provide academic advising to their students.
13. Through a recent restructuring of the prerequisite courses, the Program facilitates the admission process that enhances recruitment of qualified students from a diverse background.
14. There have been fluctuations in the number of applicants in the past years, but the program has been successful to attract a fairly steady number of enrollments.

## **Program Quality Improvement Areas**

The PPR team has considered the following three areas for further reflection and deliberation:

1. Graduation Rates and Time to Degree
2. Survey Results and Closing the Loop
3. Students' preparedness before entering the program

### **1. Graduation Rates and Time to Degree**

The past years' data show that the average graduation rate for the MS in Computer Science is around 50%. And, for students who do graduate, it can take them up to six years to complete the degree. About half of graduates of this program complete the degree within 3 years and the others take up to six years to graduate. This is a big waste of resources for all concerned parties, and therefore needs serious attention to address this issue.

### **2. Survey Results and Closing the Loop**

To assess satisfaction of the students about the program, the department conducted a survey in October 2012 in three classes, including two sections of CPSC589 Seminar in Computer Science and one section of CPSC544 Advanced Software Process. The seminar classes were chosen because it is a required course for every student and majority of the students in these classes have already taken several graduate courses. Sixty students took the survey. The survey questions are in four areas: 1. How you got into the program? 2. Your experiences in the program; 3. Your experiences with the professors; 4. The environment.

The team would like to congratulate the department for conducting the survey and also recommends that the department takes the next step to critically analyze the data and take necessary steps based on the results.

It is encouraging to note that most students gave high marks on questions relating to 'Your experiences with the professors'. However, many students gave low scores on the following questions:

I am satisfied with the variety of courses.

It (the program) matches my expectations.

I know where to ask for help when I need help.

The department needs to take steps to address the above problems. The team makes some suggestions for improvement as listed in **Table 1**.

The department also needs to aim high for the program quality, and be not complacent with a score of 6 (out of 10) from your students. They should aim for a much higher score from their students in each area.

### **3. Students' preparedness before entering the program**

During some of our meetings, many faculty members complained that at least 10-15% of their students are not prepared for their classes. They found a huge gap between the top and low performers. Because of this reason they had to lower their standards for the entire class. The students who have an undergraduate degree in a field other than computer science are particularly weak. Such students are required to take some foundation courses before they are allowed to take graduate classes, yet they are not quite prepared for the graduate classes. Students are also allowed to take the prerequisite courses out of order, which make the job more difficult. Many international students are particularly weak in doing the lab work and writing computer programs. Faculty stressed that student portfolios should be carefully examined before admitting them to the program.

**Table 1: Suggestions to Improve**

	Students are not satisfied with the variety of courses.	The program does not match students' expectations.	Students do not know where to ask for help when they need help.
All students who wanted to complete the Master's degree:	When admitted to the program, students got the list of pre-requisites and graduation requirements. In the beginning of the program, graduate advisor helps students generate a study plan. However, it appears students got lost later in the program or didn't fully understand how to successfully complete the program. Thus, the department should be more proactive to inform students more frequently how to successfully comply with those requirements during the program as well as who and where to ask for help to find co-ops, internships, assistantships, and jobs. A new graduate student orientation will help the students know how to succeed in the program. Some students mentioned that some courses in a particular track are offered less often than tracks such as software engineering. A better scheduling of the courses can help solve this issue.		
International students who wanted to complete the Master's degree and then get an CS job:	A few international students have the lack of CS basics and fundamentals. The CS department should offer more introductory, intermediate, and advanced courses more frequently so that students can build a strong foundation in CS fields. Especially, the department should give special attention to students who have the lack of verbal and written communication skills.		
Domestic full-time students who wanted to complete the Master's degree and then get an CS job:	Most of full-time students wanted to become more competitive in CS related job market. The department should increase the number of technical courses including computer programming, algorithm design, data structure, and networks courses. In addition, the department should offer more hands-on courses to teach tools, techniques, and methods which are widely used in CS fields.		
Domestic part-time students who wanted to complete the Master's degree and then advance their careers:	Most of part-time students receive tuition reimbursement from their employer. The department should offer more technology-based courses so that they can learn state-of-the-art technologies, new innovative ideas, or breakthrough solutions to help their employers become more successful.		