Review of the M.S. Program in Computer Science
University of Tennessee at Chattanooga

Reviewer

Kai H. Chang
Professor, Computer Science and Software Engineering
Auburn University

Dates of visit: March 18-20, 2018

Introductory remarks

The Department of Computer Science and Engineering (CSE), University of Tennessee at Chattanooga (UTC), offers Master of Science degree in Computer Science with concentrations in Computer Science (CS), Information Security and Assurance (ISA), and Data Science (DS). The department also offers Computer Science Option through the Computational Sciences PhD Program. This review is focused on the master program only and does not include the PhD program.

The program currently has about 60 master degree seeking students and has 13 faculty members (11 tenured/tenure-track positions, 2 lecturers). Since some faculty members have administrative assignments or joint appointments, the full-time equivalent positions for CSE is 10.5. The program has granted 8 to 12 degrees per year for the past four years.

The following findings are based on the 2015-2020 THEC Graduate Program Review Guide and Rubric.

Findings

Learning Outcomes

It should be noted that Student Learning Outcomes is a relatively new assessment requirement for graduate programs at UTC. The following findings are based on this understanding.

The program has identified four student learning outcomes. However, it appears that the program still does not have a concrete mechanism to measure these outcomes.

In the recent SACS review, the program collected some assessment data for the master program. However, the metrics used were based on ABET criteria (which are for undergraduate program) and these criteria do not align with the stated program student learning outcomes directly. The past effort does indicate CSE’s experience in collecting
assessment data and this experience should assist the program in devising and implementing assessment mechanism.

Curriculum

The program offers excellent-quality curriculum to its students through thesis and project options. The offered courses cover a wide spectrum of technical areas that a student can easily find a field of study that matches his/her interest.

Local industry representatives indicated graduates of this program are well received. The only issue is that the program does not produce enough graduates.

In an effort to broaden participation, the program offers a series of 3 foundation courses for non-CS and non-IT professionals to enter the graduate program. This well intended and designed path to computing career not only serves the program and UTC well, but also benefits the citizens of the State of Tennessee greatly. The program should be commended for this effort.

There are a few concerns.

- The program offers many online courses. These courses provide flexibility to the students. However, the qualities of these courses appear to be uneven. Some are indeed of high quality, some may not be. One example is that only PowerPoint slides are posted online and students are forced to read the textbook. They feel these courses are more like self-study courses. It appears that none of the CS graduate online courses are “certified” by the university.
- The program offers three formal concentrations – CS, ISA, and DS. While these options offer great opportunities for students, with the small faculty size, the program may spread itself too thin to cover the required teaching obligations.
- Due to the limited faculty size, the program has to cross-list almost all of its graduate electives with undergraduate courses. It appears that only the required graduate courses, i.e., five courses for each student, are specifically offered for graduate students.

Students

The CS graduate program has doubled its enrollment in the past five years, from 28 in spring 2013 to 59 in fall 2017. This is a good indication of the recruiting efforts and the quality of the program.

From a round table discussion with a group of 6 student representatives, the students expressed high-level of satisfaction of the program. They appreciate the variety of opportunities in course offerings, research topics/collaboration, professional
development, scholarships, and assistantships. One aspect of the program really stands out is the diversity of its student body, in terms of gender, nationality, and race.

**Faculty**

The department has 13 faculty members (11 tenured/tenure-track positions + 2 lecturers). Since some faculty members have administrative assignments or joint appointments, the full-time equivalent positions for CSE is 10.5. All tenured and tenure-track faculty members have a terminal degree and are well qualified to offer the reviewed graduate program. Their expertise covers a wide spectrum of areas in computer science and engineering.

This is an excellent group of faculty.

The CS faculty has much higher productivities than the averages of College of Engineering and Computer Science and the University, in terms of credit-hours/faculty and research-funding/faculty. The high credit-hours/faculty number is an indication of heavy teaching load, i.e., 3+3 for a typical faculty member. With fast evolving computing technology, such teaching load demands tremendous efforts from the CS faculty.

With computing-related student enrollment continues to grow, sustainability of such faculty performances is a concern, especially in the sense of faculty size.

**Learning Resources**

The program provides adequate instructional and research laboratories to its students. The environment within the department also makes students feel comfortable in their study and research pursuits.

The library provides excellent services to CS students and faculty. In addition to many collections, both ACM and IEEE e-collections are available. The library also provides excellent space for students seeking group discussion and/or study location. The Writing Center also provides superb assistance to students in their writing assignments and report preparation.

**Support**

There is a great demand for computing professionals in the greater Chattanooga area and the program contributes significantly to fulfill this need. While the program is short-handed in terms of faculty, the program has been able to provide excellent services to its students and local industry. However, sustainability is as concern as mentioned earlier.
In addition, the program should device a concrete data collection and analysis mechanism of its graduate placement as required in 2015-2020 THEC Graduate Program Review Guide and Rubric.