Computer Science Strategic Plan:
2010 - 2013

Goals:

GOAL 1: Attract, retain, and support a world-class and diverse faculty, staff, and student population.

Maintain the size and quality of the undergraduate education program, and increase the size and quality of the graduate education program. (Appendices 6 and 7 show the number of majors and degrees awarded in recent years, while Appendix 8 shows the enrollment projection for CS majors.)

- Maintain majors per tenure/tenure track faculty within plus/minus 5% of the same measure in the College of Engineering, while increasing diversity;
- Maintain weighted student credit hours per tenure/tenure track faculty within plus/minus 5% of the same measure as the university as a whole, while increasing diversity;
- Increase the number of MS students enrolled to approximately 30;
- Increase the number of doctoral students enrolled to approximately 30.

1.2 Maintain a diverse student body and faculty.

Attract and retain a diverse faculty. (Appendices 1 and 2 show the current faculty demographics and recent recruiting history, while appendix 4 details steps to be taken to address efforts to diversify the faculty and appendix 5 contains the mentoring plan that assists their efforts to become successful teachers and scholars.)

- Implement mentorship program for new faculty

Attract and retain a diverse undergraduate and graduate student population. Appendix 3 shows current students demographics and appendix 4 contains worksheets detailing efforts to broaden the diversity of CS students. These activities include:

- Investigate and seek new funding for summer program for high school women (chair);
- Seek external funding to support programs for high school teachers and female and minority high school students (e.g., ITEST) (chair)
- Contact female applicants (WICS);
- Provide admissions office with appropriate information related to targeting a diverse audience (chair and undergrad advisor)
- Develop alumni career profiles showing connections between degrees and careers (undergrad advisor);
• Develop “career” photos for web page highlighting the diversity of CS
graduates and alumni (undergrad advisor);
• Identify and pursue support for endowed scholarships for CS majors,
especially women and minorities (chair);
• Identify and implement mechanisms to mentor and support new graduate
students (grad director).

GOAL 2: Deliver a distinctive and rigorous discovery-based learning experience grounded
in science, engineering, technology, sustainability, the business of innovation, and an
understanding of the social and cultural contexts of our contemporary world.

Maintain overall excellence in undergraduate education
• Prepare students for the global workforce by encouraging international
experiences such as exchange programs;
  o Make students aware of opportunities in CS1000
  o Have undergraduate advisor encourage participation in exchange
    programs
• Continue to encourage co-op and internships experiences;
  o Have industry speakers present advantages of co-ops in CS1000
  o Have undergraduate advisor contact sophomores to make them
    aware of opportunities
  o Have undergrad committee develop 4-year+ study plans for those
    who choose to co-op
• Goal of 100% participation of undergraduates in a significant non-
classroom experience such as a co-op, internship, enterprise or exchange
program by graduation.

Strengthen the quality of CS graduate programs.
• Encourage research participation by top undergraduate students (faculty);
• Explore the development of “distance” MS degree (grad committee);
• Pursue 5th-year MS degree for majors (grad committee);
• Continue efforts to encourage undergraduates to attend graduate school
  (faculty);
• Identify and implement efforts to increase the number of applications
  from nearby 4-year institutions (grad committee);

GOAL 3: Establish world-class research, scholarship, innovation, and creative work that
promotes sustainable economic and social development in Michigan, the nation, and the
world.
3.1 Improve our stature as a research university and Ph.D. granting institution.

Increase the quality and stature of the CS graduate program
- Increase external funding to attract and support quality graduate students;
- Reduce time-to-degree;
  - Target of 75% of graduates finishing within 5 years of entering the Ph.D. program
- Increase completion rate.
  - Improve our current completion rate from 25% to 50%

Increase stature and funding for the Department’s research programs.
- Become a nationally ranked CS department
  Table 1 examines the top 100 CS programs in terms of federal research expenditures and in terms of US News rankings. Programs ranked in the top 100 in federal research expenditures have either significantly more full-time faculty members than Michigan Tech’s CS Department, or significantly smaller undergraduate programs. Only Lehigh has a faculty size similar to Michigan Tech, and their undergraduate program is less than half of Michigan Tech’s. In order to reach the stature of a top 100 CS program, the size of the full-time faculty must grow to be on the order of 22-25.

Given current resources, we have the following goals to improve our research programs and make progress towards becoming nationally ranked:

- Increase the number of proposals submitted to at least an average of 2 proposals per year per faculty member.
- Increase the three-year average research expenditures to $650,000 per year, with special attention to the support of graduate students;
- Increase the number of publications in respected peer-reviewed journals and conference proceedings to an average of 2 publications per faculty member per year.
- Increase research interactions with other departments, leading to greater participation in large interdisciplinary proposal submissions with a goal of 2 total proposals per year with budgets greater than $500,000.

- Increase national visibility by
  - Bringing to campus external speakers in areas closely related to research areas of untenured faculty and topics where multi-disciplinary proposals are being developed;
  - Encouraging faculty participation in professional service (conference and journal reviewing, NSF panels, professional organizations, etc.)
- Strategically utilize the seminar series to support research, especially by reaching out to application areas;
- Strengthen relationships with alumni in order to provide a foundation of philanthropic support for departmental programs
  - Increase contacts (focused visits, newsletters, etc.);
  - Establish industrial advisory board;
  - Solicit contributions from alumni;
  - Consider an alumni award, but certainly utilize CSA Academy of Arts and Sciences to recognize distinguished CS alumni.

(Appendix 10 shows the pattern of gifts to the department.)

### Table: Research and Ranking of CS Departments

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1"Research expenditure data taken from the National Science Foundation federal expenditures spreadsheet. Faculty size and undergraduate program data taken from the ASEE online database.
3.2 *Promote economic and social development and innovation in Michigan, the nation, and the world.*

Strengthen relationships with industry:
- Develop promotional materials aimed at potential industrial partners, such as web pages identifying department strengths and focuses;
- Bring industrial speakers to campus with a goal of 2 per year;
- Better utilize existing alumni connections with industry;
- Pursue industrial research opportunities and collaborations, such as SBIR projects.

3.3 *Address societal needs through global partnerships.*

Pursue cooperative agreements with high-quality international institutions. Specifically, we will continue to pursue agreements with the following institutions:
- Beijing Normal University, Zhuhai Campus
- Fachhochschule Osnabrück