

Charter

Computational Science & Engineering Research Institute

Version 1.0

1 Mission

The Computational Science and Engineering Research Institute will foster education and research in the development and application of computational technologies to problems of national interest in the sciences and engineering. It will support the CSE Ph.D program and facilitate the use of advanced computational techniques in all aspects of research at MichiganTech. The Institute will provide students and faculty with the structure and resources needed to accomplish these goals.

CSERI has the following goals:

- Continue the development of the CS&E academic program as a successful, nondepartmental, interdisciplinary degree.
- Establish CS&E as a recognized academic discipline at MTU.
- Establish CS&E as a recognized research area at MTU that addresses scientific and engineering problems of national interest.
- Establish the CSERI as the focal point for externally funded, computational research projects at MTU.
- Attract CS&E faculty to MTU.
- Establish the CSERI as the primary provider of high performance computational resources at MTU.

2 Activities

The activities of the CSERI fall into two categories. The first consists of activities that support the students in the CSE Ph.D program. The second group of activities is the core of the ongoing activities of the CSERI.

2.1 Supporting the CSE Ph.D Program

The viability of the CS&E Ph.D. program is critically dependent on the successful completion of the students currently in the program and on the continuing admission of new students. The following activities are of the highest priority to the Institute's support of the CS&E degree program.

- **Ensure current CS&E Ph.D. students complete their degrees in a timely manner.** Advisors of CS&E Ph.D. students must give these students high priority and they must be responsive to the unique needs these students are likely to have during the coming two to three years. All current students are expected to complete their degrees on schedule. Every effort will be made to provide the support needed to these students in the event exceptional circumstances arise.
- **Recruit new students.** At least four new students should be recruited each year to ensure that one or two graduate each year. Most CSE students come to the program from MS programs at Michigan Tech. Special effort should be given to bring in students from outside MTU.
- **Obtain funding for the direct support of CS&E students.** Direct support of CSE students will help the recruiting effort.
- **Develop a core curriculum for the Ph.D. and develop an MS program.** Problematic among these goals are the establishment of a CS&E core curriculum and MS program. It is difficult to establish a core curriculum because of the diversity of the CSE students.
- Support CS&E graduate students in the form of startup fellowships, "bridging" support, and travel.

2.2 Ongoing Activities

The following activities are the primary, ongoing goals to which the CSERI is committed.

- **Increase external funding.** The CSERI must increase the level of outside funding of CS&E research at MTU. The current national agenda is strongly supportive of CS&E research. With suitable incentives, faculty participation will grow and external funding growth will follow. A continuing task of the CS&E faculty will be to identify projects to pursue and to organize joint funding efforts.
- Coordinate large scale, interdisciplinary, interdepartmental funding efforts centered on computational science.
- Provide incentives to students, faculty, and departments to participate in CS&E activities.
- Provide computational resources to support CS&E students and faculty.
- Maintain CS&E as the center of high performance computing at MTU.
- Provide a CS&E seminar series that includes outside speakers.
- Offer computational expertise for researchers undertaking computer-intensive projects.
- Manage CS&E resources for the benefit of its students, faculty, and the MTU community.

3 Governance

3.1 Faculty

Membership in the CSERI is based on activity during the past one to two years, including committee membership, student advising and recruiting, general participation, teaching, proposal-writing, and research contributions. The current list of CSE faculty is maintained on the CSE webpage, <http://www.cse.mtu.edu/people.html>.

3.2 Faculty Committee

A standing Faculty Committee of CSE faculty is responsible for providing continuity and for advising the Director. The Faculty Committee reviews matters of policy, particularly with regard to admissions standards and the CSE degree program standards. The Committee makes recommendations for the acceptance of applicants to the CSE program as well as recommendations to determine whether a project and associated grant should be identified as a CSE project. Finally, the Committee is responsible for reviewing the budget for the Institute. The Director is an *ex officio* member of the Faculty Committee. The current membership of the existing CSE Faculty Committee is listed on the CSE webpage, <http://www.cse.mtu.edu/people.html>.

CSE Faculty Committee	Academic Unit
Phillip Merkey	Mathematical Sciences and Computer Science
Robert Nemiroff	Physics
Warren Perger	Electrical & Computer Engineering
Steven Seidel	Computer Science
Franz Tanner	Mathematical Sciences

The CS&E faculty nominates and approves a new member of the Faculty Committee when their term expires or when a position becomes vacant.

Other committees may be formed at the will of the CSE faculty.

3.3 Director

The Director is nominated by the CSE faculty. The nomination is sent to the Vice President of Research for approval. The Director is responsible for academic program(s) including admissions, recruiting, curriculum, and student advising. The Director is also responsible for the research program, administration, support, and personnel. The Director will serve as the primary contact for the CSE and will represent the institute to the MTU community as well as the national and international computational science community.

3.4 Program Review

The CSERI will be reviewed every 5 years. The next review will be done in Dec of 2007. The review of CSE degree program and the CSERI review will be done together.

4 Resources

It is important to the identity and viability of the institute to have an established home. The machine room on the third floor of Rekhi Hall has been designated the CSERI machine room. Most of the CSERI's computational equipment is housed in that room. The rest is currently housed by the CEC. The machine room provides a tangible presents to the otherwise "virtual" institute. However, there is no restriction on where CSERI equipment can operated and maintained.

5 Funding

The overhead return structure for the CSERI has been designed to provide the funds required to make the CSE a viable program. These funds cover operating expenses (administrative staff, hardware and software maintenance, licenses, etc.), direct and indirect student support, and support for professional activities (travel, workshops, invited speakers, etc). The overhead structure is also designed to provide an incentive to PI's and their department chairs. Faculty are encouraged to participate in the institute and to contribute to multidisciplinary teams that can compete for larger projects that are now being funded by the national agencies.

We the following procedure are used to determine whether or not a grant or project is appropriate for the CSERI. The PI for the grant will write a memo, usually email, to the CSERI Director. The CS&E committee will forward its recommendation along with the memo to the V.P. of Research. The V.P. of Research will make the final determination. This memo should address the fact that either the characteristics or the objectives of the project should be aligned with the mission of the Institute. Such characteristics or objectives include: the multi-disciplinary or cross-college composition of the research team, the requirement computational resources that are otherwise beyond their means, the application of advanced computational techniques, the development of computational tools and techniques, the application of novel computational methods to new areas of science or engineering research and education. Once approved, the transmittal forms will be marked to indicate proposal will result in a CSERI project.

The overhead return structure for CSERI grants or contracts is as follows:

Unit	Percentage return
MTU	40.0
Principal Investigator	9.0
Department Chair	15.0
College	7.3
CS&E	28.7

A budget outline is given below that shows the proportions in which CS&E funding is be allocated to various activities. Note that most funding for CS&E computational equipment comes from external funding. However, some of the CS&E budget is allocated for miscellaneous computing needs that are not covered by major external funding.

- 45% Graduate Program
 - direct support (*e.g.*, fellowships)
 - bridge support, travel, seminars, recruiting, matching funds
- 20% Computational Support
 - hardware, software, licenses, maintenance
 - network charges, Internet 2
- 35% Personnel
 - Director
 - Systems administrators
 - Staff