Evaluation of
the Computer Science Department and
the Institute for Advanced Computer Studies
at the University of Maryland

Evaluation Committee:
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The committee met at the University of Maryland from March 1 through March 3, 1993. After an initial meeting with the Dean, the first day was devoted to UMIACS: we met with the director, most of the permanent faculty, and several groups of rotating faculty. The second day was devoted to CSD: we met with the chair, the council, many of the faculty (in a half dozen group meetings), undergraduate and graduate students, and the chairs of some related departments. The third day was devoted to organizing our report and to an exit meeting with the Dean. The committee is grateful for the hospitality provided by the college, UMIACS, and CSD.

Our report is organized around the following sections:

1. **Structure:** This section identifies structural strengths and weaknesses of CSD and UMIACS. By structural issues we mean issues dealing with reporting structures, control of budgets, and control of resources such as space.

2. **Culture:** Each institution develops a *culture* over time. The culture of an institution is a collection of behavior patterns of its members. In this section we identify those aspects of the culture of CSD and UMIACS that help and do not help in the mission of the college and the university.

3. **Individuals:** The success of an institution depends on individuals, though structure and culture also play a role. This section is a brief discussion of the role of some of the dedicated individuals playing leadership roles in CSD and UMIACS.

4. **Recommendations:** We make suggestions for improving the structure and culture to better fit the overall mission of the university.

To put this report in perspective, we state at the outset that computer science activity at the University of Maryland is very strong – the department is highly ranked, and many faculty are internationally recognized as leaders in their research areas. We believe, however, that the value of this report lies mainly in the identification of areas where changes can make a very good activity even better. For that reason the report discusses weaknesses and remedies out of proportion to their place in the overall picture.

Structure

The discussion about structure is divided into separate subsections for UMIACS and CSD; for each subsection, we first consider the strengths and then the weaknesses.

UMIACS

Strengths

1. **Interdisciplinary:** UMIACS has been successful in its efforts to foster interdisciplinary research. There are several success stories demonstrating genuine collaborative research between computer scientists and people from Linguistics, Business, Government and EE. The people we talked to, who were participating in interdisciplinary research, said that the research would have been difficult to carry through without UMIACS. In many cases the research would not have been initiated without UMIACS. Clearly UMIACS is pursuing its mission of fostering interdisciplinary computing research at College Park.

2. **Common Space:** Though many people feel that the most exciting research in computing is at the interstices between fields, getting people to collaborate across fields is difficult. The approach taken by UMIACS of housing collaborators in the same building is an excellent one. The university is very lucky to have space that can be used in this manner.

3. **Leverage:** UMIACS plays an important role at getting research groups together to leverage resources to achieve common goals such as getting large parallel computers (e.g., the CM5) at the university. Here too, UMIACS is succeeding in its role of being the catalyst for active collaboration both within the university and even reaching out to institutions outside the university.

4. **Terrific Staff:** We heard unanimous praise for the staff at UMIACS. UMIACS provides valued support in preparing grant proposals, administering grant accounts, organizing conferences, and many other important activities. UMIACS staff has been invaluable in providing services that CSD staff cannot provide because CSD staff are too few and have too many other obligations.

5. **Outreach:** UMIACS has helped the university to reach out to the larger community of scholars, and to government and industry. UMIACS has helped to organize

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several important and well-attended conferences. UMIACS participates in the activities of some U.S. government agencies and it has the opportunity to do even more.

6. **Support for CS Departmental Growth and Retention:** Without UMIACS budgetary support, the department could not have grown rapidly in the mid-80s. UMIACS support has also been very helpful in retaining people in CSD during the last two or three difficult years.

7. **Support for EE Department Growth and Retention:** UMIACS has helped the EE department by supporting some of its faculty doing computer-related research.

8. **Successful Recruiting:** UMIACS played an important role in recruiting people to CSD and EE.

Weaknesses

1. **Conflicting Missions:** UMIACS has multiple conflicting missions, including the following:

   (a) Help CSD to grow by allocating UMIACS funds to CSD faculty so that CSD can hire more faculty.

   (b) Reward the faculty doing the best research in CSD and EE.

   (c) Serve as a catalyst for increased interdisciplinary computing research at the College Park campus.

   People in different positions in the administration have differing opinions about the relative priorities of the conflicting missions. Also, these priorities seem to have changed over time: when UMIACS started, the priority of helping CSD grow seemed paramount; later, the priority of rewarding faculty doing the best research became the most important; now, the interdisciplinary mission is stressed. The lack of a mission statement, clearly articulated to the entire College Park campus, is a severe problem.

   During times of growing budgets, conflicting missions can be satisfied to some extent. Now, at times of stagnant or even decreasing budgets, a clear mission is essential.

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2. **UMIACS Controls CSD Rewards:** During the recent years of extremely tight budgets, CSD has had very limited resources to reward faculty doing exceptional work or starting new courses, new research directions, or community outreach. UMIACS has worked to reward CSD faculty. The structural problem is that the reward system for one organization is controlled by another. CSD has missions, such as undergraduate teaching and minority recruiting, that are not central to UMIACS. UMIACS is expected to use its resources to further its own mission. CSD needs to control its own resources and to use them in a flexible way to achieve its own goals.

3. **Two-Class Citizenry:** Some faculty are supported 75% by UMIACS, some 50% and some less, some are supported on a permanent basis, some on a temporary basis, and some not at all. This creates a feeling of a class structure, in addition to (and orthogonal to) the traditional professorial hierarchy.

   Most faculty understand the process for promotion in the traditional hierarchy. This process is usually spelled out in writing, and involves deliberations at all levels of the administration. The criteria employed by UMIACS to appoint faculty to permanent positions and to rotating positions, and to determine the degree of support (25%, 50%, 75%), are documented and understood far less well, subject to far less review, and potentially far more subjective (for instance, the expected impact of proposed research as evaluated by a small group).

   Many faculty seem to feel that the criteria for a position in UMIACS overlap with the criteria for promotion in the traditional university hierarchy: excellence in research and a strong reputation in one's research area. The presence of two hierarchies, both concerned with research excellence, is confusing. This problem will decrease if a unique mission for UMIACS, different from that of CSD, is articulated, and if it is possible to reward research excellence outside of UMIACS.

4. **Limited Flexibility:** The Dean and the higher administration seem to be placing emphasis on UMIACS' mission to engender interdisciplinary research in computing. To meet this objective, UMIACS needs to be flexible to seize new opportunities that arise, to drop projects that become self-supporting, and to also drop projects that are unsuccessful. UMIACS' flexibility is limited by the funds it must provide to its permanent faculty, and the funds it must provide to CSD by way of rotating faculty to keep CSD afloat. Dynamic response to a rapidly changing environment requires more flexibility.

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5. **Inadequate Intellectual Leadership in Interdisciplinary Research:** If a major role of UMIACS is to spearhead interdisciplinary research in computing across the College Park campus, then the management of UMIACS must play the major role in identifying thrust areas and in bringing about collaborative research. The Director has played an energetic and valuable role in this effort. It is far less clear, though, that the remaining management of UMIACS (including permanent members and long-term rotating members) has been active in identifying new areas of opportunity and aggressively bringing about collaborations. We feel that UMIACS faculty should take the initiative in identifying new exciting interdisciplinary areas (whether or not they themselves will work in those areas) and should then either stimulate activity in these areas or drop them after due deliberation. *UMIACS faculty should be viewed by faculty across the College Park campus as being the visionaries of interdisciplinary computing research.*

    The governance structure of UMIACS is at variance with the emphasis on spearheading interdisciplinary computing research. UMIACS does not require its faculty to provide intellectual leadership in interdisciplinary computing. The faculty are rewarded for continuing their ongoing research, and doing it well. In particular, permanent faculty positions are offered to people doing excellent research in their own areas. The strategic plan for UMIACS seems very close to the union of the individual agendas of the permanent members. As such, it appears to be intended to justify their own UMIACS funding.

    In the present structure, the permanent members and long-term rotating members also administer the orthogonal mission of engendering interdisciplinary computing research. Given the increasing emphasis on the mission of fostering interdisciplinary computing research, there must be more attempts to identify new directions for the College Park campus.

6. **The Primary Reward is Teaching Buyout:** The primary incentive for participation in UMIACS seems to be reduced teaching. That situation is sometimes at odds with the needs of the department. A consequence of the focus on rewarding the best research with reduced teaching is that some of the department's stronger research areas have an insufficient number of courses.

    Given the interdisciplinary mission of UMIACS, we would have expected the primary reward to be more funds focused on incubating new interdisciplinary efforts.

CSD

Strengths

1. **Undergraduate Education:** The undergraduate education program is impressive. Most core courses are taught by professors – not instructors, visitors, or TAs. Some faculty do a tremendous job of being available, inviting undergraduates to participate in their research groups, giving advice regarding courses and careers, and generally being friendly. A small number of faculty names were mentioned by several of the undergraduates as being truly helpful. This small core of CSD faculty has done a terrific job in improving undergraduate education to the point that the entire campus can be proud of its CS undergraduate education. Many Maryland undergraduates go on to graduate education in the very best schools, and compete for top positions in industry.

2. **Strong Groups:** The department has several strong groups in a variety of areas. Some of the groups are quite large (in addition to being strong) and, in many cases, collaborative.

3. **Strong Individuals:** The department has very strong individuals in many areas.

4. **Effective Council:** The council has become more effective in the past several years. In the past, the council was used primarily as a mechanism for delivering announcements. Now, the council is used to determine direction (as, for example, in strategic planning) and to build consensus. Most importantly, the council has become increasingly proactive, identifying opportunities and warning of potential problems, instead of being merely reactive.

5. **InterCollege Activity:** The department and its chair have been proactive in setting up a computer engineering program with EE despite perceived difficulties in cooperating across two colleges.

6. **Support for Young Faculty:** The department has been helpful to young faculty in setting up laboratories and similar ventures despite its limited staff and shrinking budgets.

7. **Adequate TA Support:** The department seems to have adequate (although certainly not extravagant) TA support – but we note that 50% of TA positions are funded from unfilled faculty positions.

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<center>**Weaknesses**</center>

1. **Lack of Consensus and Ineffective Governing Structures:** The department does not appear to have a common vision. As a consequence, building a consensus on any issue is difficult. Examples of issues for which consensus building has either taken many years or has not succeeded include changing the Ph.D. comprehensive exams, and deciding the areas in which to recruit new faculty.

   To a visitor, the structure of CSD seems closer to a loose federation of units for different areas (A.I., Systems, Theory, Software Engineering,...) than an integral whole. The governance of a federation is difficult in the best of times, but is extremely difficult in times of diminishing resources.

   Decision-making in a federation is slower and more conservative than in an integral unit. Building consensus, without a common vision, requires a great deal of time. When decisions are made without total consensus, there is insufficient commitment from all members to the group to uphold the decision against inevitable dissension. As a consequence, strife ensues.

2. **Excessive Dependence on Counting in Evaluations:** We noticed a reluctance to evaluate research from the point of view of long-term impact, and a preference to use "objective measures" such as numbers of papers, numbers of grants, amounts of dollars and so on. Though counting has value as a measure of activity, it is not an ideal measure of impact. A few seminal papers open up new areas of research, and CSD should attempt to nurture people who write such papers.

   The preference for counting may also be a consequence of a lack of a common vision. Subjective measures require that the evaluators agree on what is important.

3. **Slow to Move into New Areas:** One strategy for a good department to improve is to focus on unique synergistic opportunities that derive from the location of the department – its proximity to government, to industry, and to other strong departments on campus. A related strategy is that of developing areas that are likely to become important in the future, and placing less emphasis on mature areas. These strategies are risky, but conservative strategies are not likely to propel a department ranked in the second 10 into the top 10.

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The department seems slow to move into new areas. Again, this may be a consequence of a lack of consensus on what exciting areas will emerge, as well as an evaluation structure that provides disincentives for current faculty to change areas.

4. **Dependence on UMIACS:** The department is unable to control its budget because of its dependence on UMIACS financial support. The department has inadequate resources and inadequate flexibility to reward its members who embark on new directions.

5. **Graduate Program Not High Priority:**

    (a) Recruiting to the graduate program seems passive. Recruiting in most schools with which Maryland competes is much more active; departments actively search for students and then do their best to recruit them.

    (b) Graduate students are not adequately mentored after they arrive until they pass their comprehensive exams and join a research group. Incoming students are given advisors, but the students seem to be in limbo until they jump over the much-feared hurdle of comps.

    (c) The graduate core curriculum seems stagnant. This is especially surprising given CSD's active research program.

    (d) The 700-level courses are not well-rounded. There are many research seminar courses, and there are the standard core courses, but not enough in between.

    (e) The comprehensive exams are viewed as a barrier with little educational value. Comprehensive exams are feared in most departments, but graduating Ph.D.s often admit that the exams had a significant educational role. In CSD, the educational role of the comprehensives, as perceived by most Ph.D. students, seems very small; they seem to think of the comprehensives almost exclusively as a filter.

    (f) It is clear that the production of top quality Ph.D. students (students recruited by the very best academic departments and industrial research labs) does not play a major role in the department's evaluation and reward system. (We shall have more to say about the department's evaluation and reward system, which we feel requires serious attention, in a later section.)

6. **Joint Appointments:** The absence of interdepartmental joint appointments with EE and other departments is a lost opportunity.

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7. **Course Load:** The official course load of 4 courses over 2 semesters is above the national average of 2.9 courses per year. This forces the department to use accounting tricks with UMIACS funding to reduce the course load. A cleaner structure would be to have a course load comparable to the national average without the need to rely on UMIACS.

8. **Minorities:** We did not find evidence of aggressive proactivity in recruitment and retention of minority undergraduate and graduate students. The D.C. area should present unique opportunities in this regard.

9. **Relationship with CfAR:** The vision group and CfAR are among the strengths of the College Park campus. The "arms length" relationship between CfAR and CSD is a lost opportunity for synergy.

10. **Salary Compression:** Three or more years of no salary raises, or very low raises, causes several problems. A serious problem is that of salary inversion and compression. The faculty should feel that rewards are fair, and some faculty members in CSD feel that rewards have not been fair.

    There are many issues in determining salaries of incoming faculty, including paying a salary attractive enough to enable the candidate to participate in the relatively expensive suburban D.C. housing market. We are not criticizing salary decisions made by CSD. The structural problem is that several years of small raises, coupled with aggressive recruiting, hurts morale if all the faculty do not subscribe wholeheartedly to these decisions. For the most part, CSD faculty understood the problems faced by the university and the department, and appreciated the actions taken by the college and the department in an extremely difficult situation. There were, however, some exceptions.

Culture

The discussion about culture embraces both UMIACS and CSD. We first consider the strengths and then the weaknesses.

Strengths

1. **High Activity:** Almost everyone is very active in one or more of research, education, and administration. The department seems to have a tradition of activity among its members.

2. **Collaboration:** There is significant collaborative activity within groups inside CSD. There is relatively little across groups (A.I., Systems, Theory, Software Engineering...) though that is changing, and certainly UMIACS had done a great deal to further the change.

   We do not advocate collaborative activity as an end in itself, but we are concerned about cultural barriers to collaboration.

3. **Outreach:** There are new and valuable outreach programs to the community such as the K-12 program.

4. **Individual Initiative:** Individual initiative is allowed to flower. Faculty members have started work in new areas, new collaborative efforts have been started in recent years, some faculty members have put in a lot of energy into the undergraduate program.

5. **Strong Junior Hires:** The faculty recruits, in recent years, are strong. The recruiting program seems to have become much more thoughtful, proactive, and selective than in earlier years of extremely rapid growth.

6. **Departmental Organization:** The overall departmental organization (for instance, a council with student members and members from all ranks) seems inclusive and good. The organization can be used effectively given more goodwill and unity of vision.

7. **Growing Interdisciplinary Work:** We noticed increasing attempts at interdisciplinary work in several areas. The computational science educational projects of Stewart and O'Leary are examples.

Weaknesses

1. **Parochialism Bordering on Selfishness:** The department seems similar to a federation of little groups. Faculty members seem to feel strong "ownership" of their groups, but much less ownership to the department, college, or campus as a whole. This lack of ownership is strikingly evidenced by the many faculty, including senior ones, who referred to the department as "they" rather than "we."

   The culture does not seem to foster a sense of belonging to the larger group. All members of a group must feel a sense of participation, belonging, ownership and pride for the group to move forward rapidly.

   The lack of community spirit is evident in the difficulty in sharing resources, deciding areas within which to recruit, and the reward system generally.

2. **Desire to Avoid Teaching:** The desire to avoid teaching by almost all of the faculty was striking. As best as we could tell, the distaste for classroom teaching did not seem to be a consequence of inadequate TA support or poor classrooms, but seemed to be part of the culture. The primary reward for excellent performance, beyond advancement through the traditional university professorial hierarchy, seems to be reduced teaching responsibilities. Reductions of teaching loads to the national average are certainly understandable, but there seems to be strong desire among large numbers of faculty to teach even less than one course each semester.

3. **Excessive Conservatism:** The reluctance to change is remarkable. Conservatism has its place, but institutions in areas as dynamic as computing must adapt to new areas and to new kinds of research ventures. The lack of change to the core curriculum is a case in point. The excessive conservatism is due in part to structural problems, and in part to a feeling of complacency.

4. **Demoralization:** There is evidence of some demoralization. There is also evidence of disunity. The egregious breach of electronic mail security following our visit to campus is a case in point.

   Some are reluctant to contribute to the general good. A few are active and vocal about feeling left out.

   These problems are partly due to the restricted levels of resources, and partly to UMIACS' control of the CSD reward structure, but there are deeper causes as well – to a disturbing extent, disunity has become institutionalized.

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Individuals

We were not asked to evaluate individual members of the faculty or staff. We wish to emphasize, however, that CSD and UMIACS have very strong researchers who are doing excellent work. An evaluation of institutions is incomplete without some mention of its leaders. The heads of UMIACS and CSD seem to us to be doing excellent jobs in difficult circumstances. Next, we discuss our perceptions of the leadership of Larry Davis and Satish Tripathi based on conversations with heads of other similar units, faculty, and students.

1. **Larry Davis** is doing an excellent job of helping to start interdisciplinary research activities. Several faculty members referred to Larry's personal efforts as being instrumental in starting and maintaining interdisciplinary computing research. Larry played an important role in getting the CM5 to Maryland by putting together a consortium of groups and organizations; such collaborative efforts will become increasingly important. Allocating space for interdisciplinary research in a single building, and encouraging meetings and workshops, is also something that Larry has pushed for. Many faculty members said that Larry was a person who responded to requests with "Let's see how we can make this happen". A positive personality, who encourages new directions and new ways of doing things, is a definite plus for the UMIACS director.

   The structural and cultural problems faced by a director of UMIACS have been outlined already. A case in point is that Larry exercises relatively little direct control on who gets appointments to UMIACS or the level of support. A committee puts applicants into three categories, and Larry exercises his judgment mostly for the (small) middle category. Larry plays the role of catalyst more than director.

   Larry has limited flexibility in managing UMIACS: the permanent members' budget is fixed, a certain amount of money has to be given to CSD to keep CSD afloat, and the appointments to UMIACS are determined by committee (for the most part). Despite the limited flexibility and multiple conflicting missions, Larry has done an excellent job of leading UMIACS.

2. **Satish Tripathi** has been doing an excellent job in a very difficult situation. Among the very worst possible situations for a chair is the situation in Maryland: a period of rapid and somewhat uncontrolled growth with unbounded optimism and the hiring of a large number of faculty of variable quality, followed by a period of flat budgets and tenure-denials, and the continued recruiting of faculty

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at (perforce) competitive salaries with ensuing salary compression problems. This coupled with the federated structure of the department and its dependence on UMIACS makes the position of chair extremely difficult.

Satish has been trying to build a consensus for the major decisions made by the department. It is not possible, or desirable, to involve the entire department in every decision such as negotiating salary for a potential recruit. Satish appears to have attempted to be inclusive in decision-making. Total consensus is probably impractical in a department as large and diverse as CSD. Yet, decisions without total consensus seem to create strife and there is insufficient support from the rest of the faculty in reducing tensions. Satish seems to have done everything he can to help create a harmonious climate. The rejuvenated council is a case in point.

Some faculty members said that they would like Satish be more authoritative, and spend less time identifying consensus. A more authoritative head can make decisions faster and move into new areas. An authoritative head, however, needs *active* support from the large majority of the faculty. There is evidence that many faculty members, including some senior members, are not actively engaged in the governance of the department. In this situation, it is difficult for a chair to act authoritatively. Satish seems to have done an excellent job, in difficult circumstances, perhaps spending more time building consensus than is necessary at other institutions.

3. **Other Individuals:** CSD and UMIACS are blessed with many other strong individuals, some of whom actively participate in the life of these institutions (in addition to teaching their courses and doing good research). We decided not to identify these people because our identification may not be complete.

We wish to emphasize that a department with a large number of strong individuals, each of whom does his or her "own thing" well but is not otherwise actively engaged in the life of the institution, is not likely to move rapidly into the ranks of the top departments in the country.

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Recommendations

UMIACS

1. **Mission:** Define a clear and succinct mission for UMIACS. This mission should be distinct from the mission of the department. Since the mission of the department is excellence in teaching and research in computer science, the mission of UMIACS must be something else. A possible mission is to serve as a catalyst for interdisciplinary research in computing across the College Park campus.

2. **Budget:** Provide adequate resources to meet the mission. Split the existing budget into two parts, one managed by CSD and the remainder managed by UMIACS. The part managed by CSD is to meet CSD's mission of excellence in computer science teaching and research. This part also must include the funds used by CSD to hire faculty. The part managed by UMIACS is for the sole purpose of meeting UMIACS' more focused research mission, including the fostering of interdisciplinary research in computing.

   (Our charge was to review UMIACS and CSD. We recognize that EE, too, has a special relationship with UMIACS, although not on the scale of CSD's. We have not addressed that relationship in this report.)

3. **Strategic Plan:** Have UMIACS produce a strategic plan to meet its more focused mission. In particular, the plan should identify areas of opportunity across the entire campus, paying particular attention to the strengths of other departments and to the unique opportunities provided by the D.C. area. The plan should be much more than a collection of the individual plans of the permanent members of UMIACS. The plan should have visibility at the level of the Provost and President.

4. **Advisory Board:** Activate the advisory board for UMIACS. The advisory board should help the director meet the mission of interdisciplinary research across the College Park campus.

5. **Permanent Appointments:** Do not limit the flexibility of the "new UMIACS" by making further permanent appointments or otherwise committing funds on a permanent basis. To the extent that permanent memberships are deemed to

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play the role of chaired professorships rather than fulfilling the UMIACS mission, consider decoupling the two roles and reconstituting UMIACS membership.

6. **Clarify Selection Procedure:** Clarify the procedure by which appointments are made to UMIACS, and funds are provided by UMIACS. The evaluation criteria can be subjective, but the criteria must be formulated and disseminated. The criteria must not be identical to the criteria used by the department in promotion, because dual-reward procedures for identical criteria are confusing. Presumably, the criterion will be that of furthering UMIACS' mission.

7. **Provide Intellectual Leadership in Interdisciplinary Research:** The director and long-term members of UMIACS must be seen by people all across the College Park campus as providing the intellectual leadership in interdisciplinary computing. This requires the long-term members to have a much broader interest in computing than continuing to do their excellent research. The long-term members must engage other people on campus in active dialog with a view to furthering computing research. This activity currently is being carried out by the director, but the campus must also be able to look to the long-term members for this leadership.

8. **Reduce Emphasis on Teaching Buyout:** The primary reward of UMIACS should be the opportunity and facilities to participate in research, particularly in interdisciplinary research. It is the responsibility of CSD and the other departments to determine teaching loads. The director may decide that a temporary reduced teaching load is necessary for a particular project, and may request that reduction from the individual's department, but this should be a decision for a specific project and not a broad-based consequence of UMIACS membership. Benefits of UMIACS other than teaching load include office space in an interdisciplinary community, excellent shared equipment and staff, visibility across campus and the D.C. area, funding for graduate students and postdocs, and access to students and colleagues with knowledge in computer science and other areas. Indeed, rather than distancing itself from teaching, UMIACS can help start new interdisciplinary courses.

9. **Resources:** Make no further cuts in UMIACS. If cuts must be made, the mission must be scaled down.

CSD

1. **Graduate Program:** The department must realize that its success rests in large part on its graduate program. *All members of the department must help in improving the graduate program.* Some members can be given the specific task of revamping the graduate program, and people with this task should be given time off from teaching because this task is directly related to the teaching mission.

   The quality of graduate students should be improved by better financial support, aggressive recruiting, and refusing to admit students who seem less than excellent. In the short run, limiting graduate enrollment may cause hardships, but in the long run decreased variability in the quality of graduate students will help the department in many ways.

2. **Teaching:** The culture must be changed to view teaching as a rewarding experience. Course loads should not exceed the national average, but teaching should be regarded as an important and valued part of the job. The department must find out why so many of the faculty avoid teaching, and then take steps to turn that situation around.

   We feel that as a matter of general policy, all faculty (including permanent members of UMIACS) should teach two courses per year, and that all faculty should regularly teach both undergraduate and graduate courses.

3. **Reduced Emphasis on Counts in Evaluations:** The department and UMIACS should reduce the emphasis on counting – counting papers, counting dollars, counting numbers of grants, etc. – in evaluating faculty performance. What matters is *impact*. Impact can be assessed, but it cannot be counted. The department and UMIACS should be willing to use subjective criteria such as likely impact on the broad area of computing over a significant period of time. An emphasis on counting can have a number of deleterious side-effects, including faculty who work in increasingly narrow areas and are unwilling to try new research directions.

4. **Nurture Interdisciplinary Work:** The mission of CSD is excellence in teaching and research in computing, and not specifically interdisciplinary activities. On the other hand, the department can benefit from the synergy provided by UMIACS by

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also nurturing interdisciplinary work. In our view, a key value of interdisciplinary work is that it facilitates the identification of "high leverage" computer science research problems – problems whose solutions really matter to someone. It should be every researcher's goal to work on high leverage problems.

5. **Permanent Faculty:** The permanent UMIACS faculty should be encouraged to become much more actively involved in the general welfare of both UMIACS and their departments. The permanent UMIACS faculty were appointed for their excellence in research. They also have an obligation to further interdisciplinary research. The permanent members should be the leaders in CSD and across campus in teaching and research.

6. **The Computer Science Center:** The name of the Computer Science Center should be changed. It's very confusing.

7. **Resources:** The funding level and associated resources for CSD should be sustained. Additional funds should be provided, as soon as possible, to help alleviate stresses in CSD.

8. **Strategic Plan:** The strategic plan worked out by the department is a good first step. The department should attempt to chart out a course for itself over the next five years, even though the future is uncertain. Everybody in the department should feel ownership in the plan. Then, the department should change the plan on a regular (perhaps yearly) basis, and measure its progress in terms of meeting its plan.

The committee wishes to re-emphasize that UMIACS and CSD are very strong organizations doing very good work. This report is not balanced – it deals primarily with problem areas and potential remedies. The committee feels privileged to have worked with groups as strong as UMIACS and CSD.