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UNIVERSITY OF MARYLAND

CENTRAL ADMINISTRATION

ADELPHI, MARYLAND 20783

OFFICE OF THE
VICE PRESIDENT FOR GRADUATE STUDIES AND RESEARCH
(301) 853-3692

October 15, 1984

Dr. John S. Toll
President
University of Maryland
Elkins Building

RECEIVED

OCT 21 1984

DIV. OF MPSE

Dear President Toll:

I am pleased to report that the President's Advisory Council for Graduate Studies and Research unanimously approved the attached proposal for "Establishment of the University of Maryland Institute for Advanced Computer Studies" at its meeting on October 10, 1984. The discussion which preceded the vote was both lively and thoughtful and several participants expressed the thought that the arrangements for the governance and administration of this Institute is a suitable model for use in other institutes now under discussion within the University.

Under current policy of the Board of Regents final approval for establishment of the University of Maryland Institute for Advanced Computer Studies rests with you. You may, however, want to include the establishment of the Institute as part of an information report to the Board of Regents.

Sincerely yours,

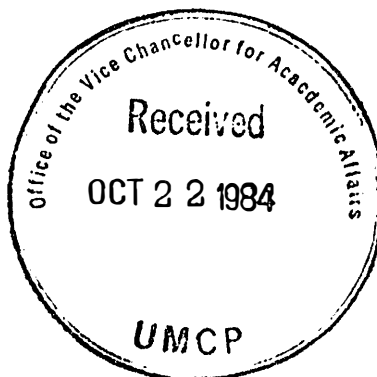
David S. Sparks

David S. Sparks
Vice President for Graduate
Studies and Research

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DSS:jf

cc: Dr. Albert H. Bowker
Dr. Jules Enig

Attachment



cc: PAC 10/19/84

**ESTABLISHMENT OF THE
UNIVERSITY OF MARYLAND INSTITUTE FOR ADVANCED COMPUTER STUDIES**

October 12, 1984

PURPOSE

The University of Maryland proposes to establish an Institute for Advanced Computer Studies in order to advance the development of the hardware architecture, components, algorithms, software systems, and computational mathematics needed for advanced computer systems of the future, particularly supercomputers. The institute will provide a framework for support of numerous existing computer-related research activities within the University; in collaboration with the relevant academic departments, it will serve as a focal point for new interdisciplinary research in the computer sciences across the University campuses. The institute will facilitate collaboration between the University, industry, and the federal government and will help attract new high technology industry to the State.

RATIONALE

Recent national studies, including the Barden-Curtis Report (for the National Science Foundation) and the Lax report (for the Department of Defense and the National Science Foundation), have identified as critical issues for the future of computing research in advanced computer architectures, high-speed networking, and systems software. A prime focus of advanced computer architecture is faster and more powerful computer systems. Supercomputers, defined as the fastest and most powerful scientific computing systems available at any given time, and their availability have

been important for this nation's advances in science, engineering, national defense, and industrial productivity. The supercomputer is recognized as key to further research and breakthroughs in many scientific disciplines, including fluid dynamics, remote sensing and image understanding, theoretical physics, meteorology, astronomy, bioengineering and economics. The power of current and projected supercomputers, however, is insufficient to meet existing needs. Research at universities and in the computer industry indicates that future supercomputers may have parallel architectures radically different from the sequential architectures of today's supercomputers. Rapid advances in microelectronics technologies make it feasible to build these parallel computers, in which new arrangements of logical elements into parallel arrays of concurrently acting parts are made. To computer architects, microelectronics researchers, and software experts, the goal of the next decade---a system approximately a thousand times faster than today's supercomputers ---is not unreasonable. This judgment is based on trends in component technology, architectural and organizational structure, software systems, and algorithms that exploit the architecture for significant applications.

The University has an excellent intellectual base from which to increase its overall efforts in the computer sciences. The University is a national leader in computer science and in software engineering, in particular. It is

also a leader in parallel processing through its Laboratory for Parallel Computation and its work on the ZMOB project, which is proving to be a prime research testbed for investigation into parallel algorithms, interconnection architectures, computer operating systems, and artificial intelligence. This research has received significant funding support from the National Science Foundation.

The University has also developed considerable expertise in computer-to-computer networking. The ability to interconnect computers allows construction of large distributed systems, upon which all proposals for supercomputer designs have been based. Testbeds of distributed computer systems exist at the University today and are used in research to improve the understanding of such systems. In addition, the University has been in the forefront of research in computer system security and reliability.

The University's strengths in computer architecture, algorithms, software engineering, networking, and performance evaluation provide an excellent base for moving toward supercomputers. Since the expertise is dispersed throughout different departments and laboratories of the University, there has not been concentrated attention on the potential of broad-based interdisciplinary programs for solving the complex problems that the supercomputer technology requires. The establishment of an institute will make possible collaborative approaches to solving these problems.

Establishment of the institute will permit the University to take advantage of current opportunities to obtain major funding; however, action must be taken quickly. The federal government is considering major commitments to the development of installations dedicated to advanced computer studies, which would have a catalytic effect on economic development in the surrounding region. The State of Maryland stands a very good chance of being chosen as the appropriate site, principally because of the very great strength at the University of Maryland in computer sciences, electrical engineering, mathematics, and the physical sciences.

It is hard to give precise national rankings in various disciplines; the best available source is the recent assessment of the scholarly excellence of faculties in various fundamental disciplines released by the National Research Council/National Academy of Sciences on behalf of the Conference Board of Associated Research Councils. The two disciplines most important to computer development are computer science and electrical engineering. In both disciplines, the scholarly excellence of the University of Maryland faculty was rated at the very top among public universities on the East Coast, and seventh and ninth, respectively, among public universities nationally.

Federal leaders look to the University to go beyond normal academic departments and build a research institute

with an academic focus which, with the federal installations, will make this area a national leader in advanced computer development. This magnet to attract high technology to Maryland can have a major economic impact on the state.

Various state leaders have responded favorably to overtures by the University and federal authorities for the establishment of such an institute. It is anticipated that the state will invest increments of \$1 million per year for three years, building to annual funds of \$3 million; these general funds will provide core support to allow the institute to include on its staff research faculty who are national experts in relevant disciplines. In August 1984, the Finance Committee of the Board of Regents approved this request, as part of the Separate List attached to the University's fiscal 1986 budget request, for submittal to the Department of Budget and Fiscal Planning and the State Board for Higher Education.

The institute will serve as an educational resource to various academic departments of the University and will catalyze development of advanced computer technology initiatives in response to State and national commercial and defense needs. The institute will be a focal point of the University for joint programs with industry; for example, an integrated University approach could concentrate on scalable architecture in the development of prototypes, develop algorithms and software for the prototype, measure prototype

performance on a variety of applications, and perform the foregoing in a manner amenable to cost/performance improvement through hardware enhancements by the industrial partner. With the University software developed on the prototype designed to run on the final implementation, further software development by the University done in parallel with final product implementation would relieve an industrial or public agency partner of long software development delays.

As a highly visible entity, the institute will stimulate and support research in the academic departments, without obscuring the identities of the departments or the campuses, by seeking increased support from external sources. Accompanying this increased research will be a strengthening of existing and the creation by the academic departments of new educational programs in critical areas. These enhanced offerings will permit the University to meet the continuing education needs of industrial and governmental organizations in this region.

In its role as a major contributor to advanced computer research, the institute will enhance the University's attractiveness to federal agencies as a future supercomputer site. This will have a substantial and beneficial effect on University programs in the physical, biological, and mathematical sciences, and engineering.

Establishment of the institute, along with probable establishment of a federally-funded supercomputer research

laboratory in Maryland, will attract top-flight faculty and graduate students to the University in areas of vital interest to the nation -- areas in which this nation is facing fierce technological and economic competition from foreign sources, particularly Japan.

MEMBERSHIP, GOVERNANCE AND ADMINISTRATION

The institute will consist of a director and members, and an administrative and support staff. The director shall be initially appointed by the Vice President for Graduate Studies and Research and shall be administratively responsible to that office during that transition time necessary to obtain state and other funding in support of its goals. When the institute has become firmly established, its management shall pass from Central Administration to UMCP; at that time, the director's appointment and service shall be governed by the policies governing the appointment of department chairs at College Park. The institute shall continue, however, to have a University-wide role and to serve as a University-wide focus for research in computer science and engineering.

A policy committee consisting of the institute director, the Vice President for Graduate Studies and Research (ex officio), and eleven representatives of relevant academic units of the University shall meet at least semiannually to review the major activities of the institute and

to advise the director on major policy matters. Ten committee members shall be appointed by the campus chancellors from appropriate academic units with the following representation: UMAB (1), UMBC (2), UMES (1), UMCP (5), and UMUC (1). The Vice President for Graduate Studies and Research shall appoint one additional member.

Appointment of institute members by the director shall follow normal University procedures applicable to faculty appointments. Almost all of the members---in terms of full-time equivalents (FTEs)---must hold joint appointments in the institute and academic departments of the University. Initially, academic faculty who wish to join the institute should so notify their department chair, who may in turn recommend a joint appointment to the institute director. For these joint appointees, appointment to the institute will be for a fixed duration (normally three years) with reappointment to the institute by mutual consent of the member, the institute, and the academic department. Rank, tenure, and promotion are determined by the academic department.

A few distinguished researchers may be hired on institute tenure lines as full-time members of the institute.

Visitors to the University may be appointed as special visiting full- or part-time members of the institute for a one-year period.

Degree-seeking students at The University of Maryland who perform thesis or dissertation research under the direction of an institute faculty member will be admitted to and will receive their degrees from an appropriate academic program on one of the university's campuses.

An institute advisory board, which will include research scientists from industrial, government, and external university laboratories, will be appointed by the President of the University after consultation with the chancellors, to provide guidance to the institute, to suggest sources of financial and personal support, and to provide liaison at the highest level.

The University is requesting core funding for the institute from the State of Maryland. Funds for the institute will be used to support the director, the administrative and support staff, and the institute share of all joint faculty appointments. The institute will be funded largely by federal, state and industrial grants and contracts. It is emphasized that the creation of the institute is an essential step in obtaining much of the expected financial support. Funding requirements for the first three years are given in Appendix A.

Initially, the director, immediate administrative and support staff, and institute members will be housed in existing offices and laboratories. It should be emphasized, however, that in addition to the academic faculty already

working at the University, new faculty and staff members as well as visiting scholars and research associates and assistants will need to be housed.

PERIODIC REVIEW

In accordance with University policy, the institute will be reviewed every ten years for the purpose of deciding on its continuance. The review will be conducted by a task force appointed by the President of The University of Maryland.

EXPENDITURE ESTIMATE OF INITIATIVE

Date Prepared: 12 October 1984

Summary Description of Initiative: Institute for Advanced Computer Studies established at the University of Maryland to advance development of hardware architecture, components, algorithms, software systems, and computational mathematics needed for advanced computer systems of the future, including supercomputers. Institute will facilitate collaboration between the University, industry and Federal government.

Initiative Proposed by: President John S. TollEstimate Prepared by: Julius W. EnigTitle: Spec. Asst. to the PresidentDept./Agency: University of MarylandTelephone: (301)853-3601Appropriate Program (8 digits) Appropriation Code: 36.02.08.02

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EXPENDITURE ESTIMATE DETAIL

	<u>FY 1985</u>	<u>FY 1987</u>	<u>FY 1988</u>	<u>FY 1989</u>	<u>FY 1990</u>
A. SALARIES & WAGES (.01 Object)					
(1) <u>Personnel Classification/No.</u>					
Director / 1.00	85,000	85,000	85,000	85,000	85,000
Professionals / 3.00	225,000	486,000	800,000	800,000	800,000
Dir. of Bus. Affrs / 1.00	40,000	40,000	40,000	40,000	40,000
Secretaries & Tech. / 1.00	14,000	108,000	180,000	180,000	180,000
Engineer/Analyst /	0	50,000	50,000	50,000	50,000
Grad.res.assts. /	0	156,000	260,000	260,000	260,000
(2) Total .01 Salaries & Wages	394,000	965,000	1,455,000	1,000,000	1,000,000
(3) Fringe Benefits (27% of A2)	106,000	261,000	393,000	393,000	393,000
(4) Gross Salaries & Fringes (A2+A3)	500,000	1,226,000	1,848,000	1,848,000	1,848,000
(5) Less: Turnover Expectancy	0	0	0	0	0
(6) Net Salaries & Fringes (A4-A5)	500,000	1,226,000	1,848,000	1,848,000	1,848,000
B. OTHER OPERATING EXPENSES:					
<u>(Objects of Expenditure)</u>					
(1) Technical & Special Fees (.02)	50,000	70,000	80,000	80,000	80,000
(2) Communications (.03)	50,000	75,000	100,000	100,000	100,000
(3) Travel (.04)	40,000	75,000	125,000	125,000	125,000
(4) Food (.05)	0	0	0	0	0
(5) Fuel & Utilities (.06)	0	0	0	0	0
(6) Automobile Operations (.07)	0	0	0	0	0
(7) Contractual Services (.08)	100,000	200,000	300,000	300,000	300,000
(8) Supplies and Materials (.09)	60,000	80,000	100,000	100,000	100,000
(9) Equipment-Replacement (.10)	0	0	0	0	0
(10) Equipment-Additional (.11)	200,000	274,000	447,000	447,000	447,000
(11) Grants, Subsidies, etc. (.12)	0	0	0	0	0
(12) Fixed Charges (.13)	0	0	0	0	0
(13) Land & Structures (.14)	0	0	0	0	0
(14) Total Other Operating Exp. (Totals of B1 thru B13)	500,000	774,000	1,152,000	1,152,000	1,152,000
C. TOTAL ESTIMATED EXPENDITURES (Totals of A6 + B14)	1,000,000	2,000,000	3,000,000	3,000,000	3,000,000

Continuation to page 31
 .. Salaries & Wages (.01 Object)

EXPENDITURE ESTIMATE OF INITIATIVE

Date Prepared: 12 October 1984

Summary Description of Initiative: _____

Initiative Proposed by: _____

Estimate Prepared by: _____ Title: _____

Dept./Agency: _____ Telephone: _____

Appropriate Program (8 digits) Appropriation Code: _____

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EXPENDITURE ESTIMATE DETAIL

	<u>FY 1986</u>	<u>FY 1987</u>	<u>FY 1988</u>	<u>FY 1989</u>	<u>FY 1990</u>
A. SALARIES & WAGES (.01 Object)					
(1) <u>Personnel Classification/No.</u>					
* <u>Part-time assts. /</u>	30,000	40,000	40,000	40,000	40,000
_____ /					
_____ /					
_____ /					
_____ /					
_____ /					
(2) <u>Total .01 Salaries & Wages</u>					
(3) <u>Fringe Benefits (27% of A2)</u>					
(4) <u>Gross Salaries & Fringes (A2+A3)</u>					
(5) <u>Less: Turnover Expectancy</u>					
(6) <u>Net Salaries & Fringes (A4-A5)</u>					
B. OTHER OPERATING EXPENSES:					
<u>(Objects of Expenditure)</u>					
(1) <u>Technical & Special Fees (.02)</u>					
(2) <u>Communications (.03)</u>					
(3) <u>Travel (.04)</u>					
(4) <u>Food (.05)</u>					
(5) <u>Fuel & Utilities (.06)</u>					
(6) <u>Automobile Operations (.07)</u>					
(7) <u>Contractual Services (.08)</u>					
(8) <u>Supplies and Materials (.09)</u>					
(9) <u>Equipment-Replacement (.10)</u>					
(10) <u>Equipment-Additional (.11)</u>					
(11) <u>Grants, Subsidies, etc. (.12)</u>					
(12) <u>Fixed Charges (.13)</u>					
(13) <u>Land & Structures (.14)</u>					
(14) <u>Total Other Operating Exp.</u>					
<u>(Totals of B1 thru B13)</u>					
C. TOTAL ESTIMATED EXPENDITURES					
<u>(Totals of A6 + B14)</u>					