

Industry/University Cooperative Center for Research in Software Technologies (CRiST)

Organization and Operating Procedures

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Contents

Executive Summary	4
1 Objective	5
2 CRiST Organization and Management	5
3 Research Program	8
4 Operating Procedures	8
4.1 Joining CRiST	9
4.2 Seeking an Industrial Request for Proposal (IRFP)	9
4.3 Preparing a research proposal	9
4.4 Funding a research proposal	10
4.5 Organization of showcases	10
4.6 Establishment of center policies	10
4.7 Selection of coordinators	11
4.8 Maintaining the center web site	11
4.9 Preparing income, allocation, and expense statement	11
4.9.1 CRiST income	11
4.9.2 CRiST expenditure	12
4.9.3 Allocation for research	12
4.9.4 Allocation for research coordination	13
4.9.5 Auditing of CRiST accounts	13
4.10 Budget proposal, approval, and funds transfer	13
4.10.1 Accounting	13
4.10.2 Funds transfer	14
4.10.3 Budget countdown	14
5 Intellectual Property Rights and Publications	14
6 Foreign Collaboration	14
Appendices	16
A Format for project abstract	16
B Format for project proposal (New or continuing)	17
C Format for project status report	18
D Format for project budget	19
E Income-Allocation-Expense statement	20
F Format for industrial request for proposal	21

G Industrial Affiliation Agreement	22
H University Affiliation Agreement	30

Executive Summary

It is proposed to establish an Industry/University Cooperative Center for Research in Software Technologies. This center, hereafter referred to as CRiST, is a consortium of academic and industrial members. It is intended to serve as a platform for bringing together engineers from the industry and faculty from academia to engage in applied research of direct value to the Indian industry that has a significant investment in computer software. CRiST consists of members from academia and industry. CRiST is managed by a Center Coordinator with assistance from Site Coordinators at other research members. Academic faculty and scientists from research laboratories carry out short and medium term research projects in response to requests from industrial members.

Each industrial member of CRiST pays an annual fee as indicated in the Industrial Affiliation Agreement executed between CRiST and the industrial member. At least 85% of this fee is used to fund research while at most 15% is used to meet expenses incurred towards the management of CRiST activities.

Academic and industrial members of CRiST meet twice each year at meetings referred to as *CRiST Showcase*. Each showcase features new research proposals by faculty and scientists, progress reports on ongoing projects, demonstrations of prototypes and tools developed, and a poster session. Each proposal is required to clearly enumerate deliverables and milestones against which the industrial members evaluate progress.

An Industrial Advisory Board (IAB) consisting of one member from each industrial member advises the coordinator on projects to be funded and the funding level. The IAB advises the Center Coordinator on issues related to long and short term policies. Industrial members have complete freedom to allocate funds from their annual membership fee to the research project of their choice. Industrial members are also able to jointly fund a research project. Faculty and scientists from member organizations are encouraged to collaborate on specific projects sponsored by one or more industrial members.

A CRiST Policy Board (CPB) oversees the overall administration of the center. The CPB is comprised of the Center Coordinator, Site Coordinators, current and past chairs of the IAB, and one representative from each member government agency.

Each member of the consortium signs an agreement that spells out the framework under which the member will function. Signing of the agreement is required for ensuring membership in CRiST. Research members sign a University Affiliation Agreement to become Research Members of CRiST. Industrial members sign an Industrial Affiliation Agreement to become Affiliates of CRiST.

Central and state governments are encouraged to support the center through funding to support center administration. They are also requested to fund research projects jointly with one or more Affiliates of CRiST. Participating government agencies that fund the center serve on the CRiST Policy Board as voting members.

1 Objective

The objective of CRiST is to provide a platform intended to bring together faculty from academia and engineers from industries to work on research problems of mutual interest. This bringing together of a variety of individuals, who operate within a well defined framework, is expected to lead to increased industry/university cooperation towards the conduct of applied research of direct value to India's software industry and organizations for which computer software is a critical component. CRiST is a distributed consortium where research is carried out at several academic sites while a thin core management is located at one site for timely and efficient decision making.

2 CRiST Organization and Management

As shown in Figure 1, CRiST is organized as a collection of members. Membership in CRiST is of two types: academic and industrial. Any university with a doctoral program in Computer Science and Engineering and related information technologies, is a potential research member. Universities and colleges that do not have a doctoral program but have faculty interested in conducting industrially sponsored research can also participate in the center through one of its research members. Research laboratories participate in all center activities through a designated academic site.

Any company, registered in India, and desirous of sponsoring research in academia is a potential industrial member. Industrial members pay an annual membership fee to the center. This fee, indicated in Paragraph 4 of the Industrial Affiliation Agreement (see Appendix G), is used for funding research projects and center administration. The center is bound to spend at least 85% of each year's affiliation fee towards research. Amount not spent is carried forward and used for funding research projects during the next year.

The center is distributed geographically at one or more academic sites. Universities, colleges, and research laboratories interested in participating in center activities do so through one of the academic sites as. One academic site is designated as the *Central Academic Site* for the purpose of center administration.

Management of CRiST is effected by the Center Coordinator and other committees as summarized in the following and defined in the Industrial Affiliation Agreement and the University Affiliation Agreement.

The day-to-day activities of CRiST are managed by a Center Coordinator with the assistance of a full-time Research Coordinator. The center coordinator and the research coordinator are located at the central academic site. In addition each academic site, other than the central academic site, is managed by a Site Coordinator. An Industrial Advisory Board (IAB) advises the Center Coordinator on issues related to project funding and the formulation of center policies. Responsibilities of various coordinators are enumerated in the following.

Center Coordinator: The center coordinator, with assistance from the research coordinator and site coordinators, is responsible for the overall management of the center. Ideally, the center coordinator should be tenured faculty member at one of the primary academic sites. The center

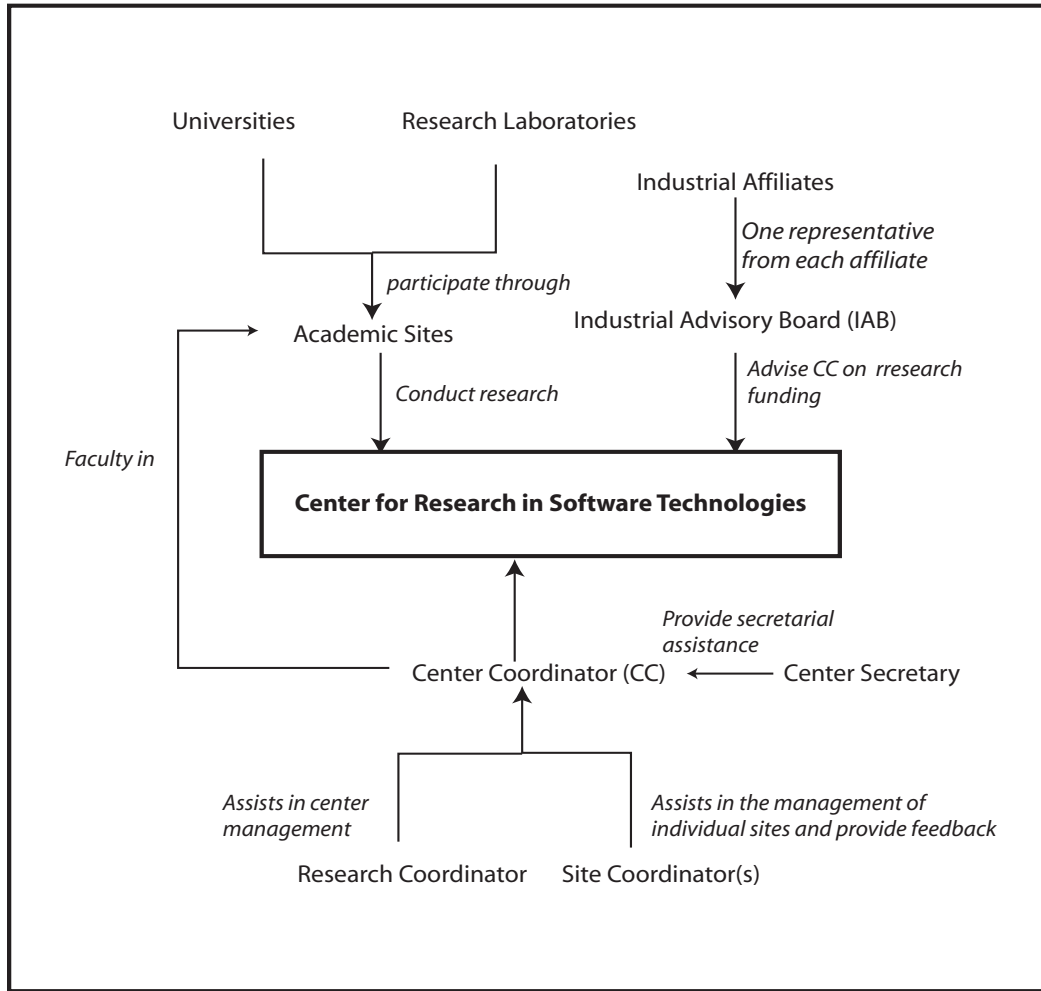


Figure 1: Organization of the Center for Research in Software Technologies.

coordinator is expected to devote approximately 30% of his/her time towards related center activities.

1. Administrative Functions

- Set up a vision for the center and its short term and long term research program in cooperation with the Industrial Advisory Board and Site Coordinators
- Recruit industrial members
- Prepare the annual budget and get the approval of the Industrial Advisory Board
- Organize bi-annual showcases
- Maintain CRiST website
- Interact with primary and secondary sites to encourage faculty to participate in center activities
- Edit a center newsletter

- Any other center related activity

2. Management of the Research Program

- Interact with member companies to obtain request for Industrial Request for Proposals (IRFP)
- Disseminate IRFPs to researchers in the corresponding areas
- Encourage and assist researchers in the preparation of research proposals
- Monitor progress of the center-sponsored research projects

CRiST Policy Board: As defined in Paragraph 1e of the University Affiliation Agreement, the CRiST Policy Board is comprised of the Center Coordinator, Site Coordinator from each primary site, Chairman of the IAB, and one representative each from any government agency that funds CRiST.

Executive Committee: The CRiST Center Coordinator and each of the site coordinators comprise the executive committee. Paragraph 7 of the University Affiliation Agreement lays out the responsibilities of this committee. The center coordinator serves as the chair of the executive committee.

Research Coordinator: The primary responsibility of the research coordinator is to assist the Center Coordinator in all managerial tasks. The two are expected to cooperate in all activities related to the center management. The center coordinator assigns center administration related tasks to the research coordinator. Ideally, the research coordinator should be a *full time* employee of the center with good managerial skills and some knowledge of the software industry in India. This individual need not be a researcher.

Site Coordinator: The primary responsibility of the site coordinator is to encourage and assist faculty at a local site in the preparation of research proposals and management of research. The site coordinator works with the research coordinator in organizing a showcase that is held at his/her local site. The site coordinator is expected to devote approximately 15% of his/her time towards center related activities.

Secretary to the Center: This individual provides secretarial support to both the center coordinator and the research coordinator. The secretarial duties are determined by the center coordinator.

Industrial Advisory Board(IAB): The IAB consists of one voting member from each industrial member. The center coordinator, research coordinator, and site coordinators participate in all open meetings of the IAB as non-voting members. Any government agency that funds the center has the option to nominate one voting member. The IAB meets during each showcase.

The IAB elects its chairman by a majority vote once every three years. The chairman arranges and chairs a meeting of the IAB during each showcase. It is during this meeting that the IAB votes on projects to be funded, assesses the progress of funded projects, and advises the center coordinator on the future course of action. The IAB also advises the center coordinator

Table 1: Recommended responsibilities of the Research Coordinator.

Responsibility	Description
Affiliate interaction	Visit affiliates at least once a year, prepare and/or update affiliate portfolio.
Recruiting	Identify potential affiliates, plan a strategy for recruiting each potential affiliate, visit potential affiliate either for exploration or as a follow up to a previous visit by the RC, center coordinator, site coordinator, or any other CRiST benefactor.
Researcher interaction	Prepare researcher profile, research project profile, provide feedback to researchers on affiliate needs, arrange PI visits to affiliates and/or potential affiliates.
Newsletter	Solicit articles for the quarterly newsletter, design and produce a final copy of the newsletter for printing; maintain distribution list of newsletter subscribers.
Internet presence	Maintain a CRiST web site.
Accounting	Maintain CRiST payables and receivables and provide a bi-annual report to the center coordinator and site coordinators. This report serves as input to the budget planning process.
CRiST Library	Maintain CRiST library (on the Internet site) consisting of CRiST Technical reports, newsletters, and other technical and administrative material.

on center policies and assists in drafting and maintaining a vision for the center. It is to be noted that all funding decisions for research projects are made by the IAB; the center directed is expected to implement these decisions.

3 Research Program

The center's research program depends on the needs of its industrial members and the interests of the academic participants. The program is framed by an Industrial Advisory Board, carried out by the research members, and managed by the various coordinators.

Each member of the IAB has the option to recommend which research project his/her company wants to fund. Two or more companies may decide to collaborate and fund a single research project. It is for the IAB chair to decide when the entire IAB needs to vote. Voting may not be needed when one or more companies decide to fund a research project jointly.

The IAB examines the center expenses at each of its biannual meetings. The income-expense statement is prepared by the center coordinator and presented to the IAB. This statement includes income from all sources, including industrial membership fee and funds received from the government or any other organization. The center income-expense statement is a consolidated document that includes income-expense statements from each academic site. Thus the site coordinators assist the center coordinators in preparing this document.

4 Operating Procedures

This section contains the operating procedures of the center. These procedures are developed, revised, and updated by the executive committee as and when needed. Any operating procedures, and any changes, must be approved by the existing IAB through a majority vote before the revisions become operational.

4.1 Joining CRiST

An academic institution joins CRiST by signing the University Affiliation Agreement given in Appendix H. Academic institutions that join the center are known as “Research member”. Faculty and students from colleges and universities that do not have a doctoral program in software related areas, may also participate in center sponsored research through one of the research members. Such institutions will not need to sign a formal agreement with CRiST.

Companies may join CRiST by signing the Industrial Affiliation Agreement given in Appendix G. Companies that are already in collaboration with an research member of CRiST via programs such as Practice School, Distance Learning, or any other industry-university affiliate programs, may suitably extend their existing agreement and join the center. *Such an extension requires the prior approval of the Executive Committee of CRiST and of any existing industrial members of CRiST.* In either case, each industrial affiliate pays an annual membership to the center which remains the same regardless of the agreement that the company has executed.

4.2 Seeking an Industrial Request for Proposal (IRFP)

Approximately 6 weeks prior to a CRiST showcase, the center coordinator requests member companies for an Industrial Request for Proposal (IRFP). Each company desirous of funding new proposals responds to the coordinator’s request with one or more IRFPs in the format prescribed in Appendix F.

The center coordinator distributes each IRFP to the site coordinators who in turn make these available to their respective faculty and/or scientists in the case of research laboratories. It is also possible for an industrial member to directly contact a faculty or a research scientist and jointly develop a proposal for funding through the center. However, it is to be noted that this latter act bypasses the entire research members of the center who do not get an opportunity to respond to a request for proposal.

4.3 Preparing a research proposal

A research proposal originates from one or more faculty from one or more research members of the center. Exactly one of the proposers serves as the Principle Investigator (PI). Others, if any, serve as Co-Principle Investigators (Co-PI). The proposal result from one or more IRFPs submitted by member companies. PIs are advised to discuss the research proposal with the affiliate likely to be the source of funds prior to preparing and presenting the detailed proposal document.

Each proposal is divided into two parts: an abstract in the format provided in Appendix 6 and a detailed proposal in the format provided in Appendix B. Notice that the proposal abstract

must be kept to within one page and adhere to the format specified. It is recommended that the detailed proposal be less than four pages in length.

Each submitted proposal is first reviewed by the center coordinator and the corresponding site coordinator for adherence to the specified format. Given that the proposal meets all the format requirements, a copy is made available to the member whose IRFP led to the formulation of this proposal. In the event this is an unsolicited proposal, it is made available to all industrial members. The proposal is finally presented to the IAB during the next showcase.

4.4 Funding a research proposal

After having evaluated a proposal, the IAB makes one of the following recommendations:

- R1: Fund the proposal as it is
- R2: Fund a revised version of the proposal
- R3: Do not fund the proposal

R1 implies that the proposal will be funded in the amount given in the proposal budget. R2 requires that the IAB clearly indicate the nature of the revisions. The proposal is funded only after the PI has revised the proposal as per IAB's suggestions and approved by the members who are to fund it. In case of R3, the reasons for rejection are made known to the PI. The PI has the option of returning to the IAB at the next showcase with a revised proposal.

4.5 Organization of showcases

The center organizes two showcases during each academic year. These two showcases are spaced approximately six months apart. Each showcase hosted by a university site. The Center Coordinator, in consultation with the executive committee, determines the location of each showcase. To provide the maximum exposure to all research members of the center, it is recommended that the showcase host be selected based on the principle of equal opportunity and the conference facilities available.

A showcase offers all individuals involved in the center to come together at an academic site and conference with each other. The showcase offers several events including, but not limited to, the following:

- Presentation of new and renewal proposals
- Presentation of status reports on funded proposals
- IAB meeting
- Poster sessions where researchers including faculty, scientists, and students, get an opportunity to interact one-on-one with representatives from member companies and invitees and show off their work.
- Presentations by selected member companies aimed at attracting researchers to conduct research on problems of mutual interest.
- Demonstrations of prototypes developed by center researchers.

4.6 Establishment of center policies

Center policies are prepared by the center coordinator in consultation with the executive committee all university. The draft policies are then made available to the IAB for approval. The center policies come into effect only with the approval of IAB.

4.7 Selection of coordinators

All management of CRiST is the responsibility of the Center Coordinator. This coordinator is a full time faculty in one of the university members of the center. The center coordinator is appointed by the IAB upon the recommendation of the executive committee. The research coordinator is hired by the institution designated as the central academic site. The site coordinator is appointed by the institution that hosts an academic site.

4.8 Maintaining the center web site

The research coordinator must maintain a web site for CRiST. The site should be hosted at the central academic site. This site should include the following items.

1. A directory of center affiliates and faculty researchers.
2. A list of technical reports and other publications that result out of center funded projects and that have been approved for public dissemination.
3. All forms needed by researchers to prepare proposals and/or status reports.
4. Schedule and agenda for the next and past showcases.
5. Any other items recommended by the IAB and academic affiliates of the center.
6. Newsworthy items.

4.9 Preparing income, allocation, and expense statement

The center director is responsible for preparing an income-allocation-expense statement for presentation to and approval of the IAB. The statement is prepared in collaboration with the research coordinator, the site coordinators, and the accounts departments of the respective academic sites. The statement is for an academic year.

This statement contains three sections: income section, allocation section, and expense section. The income section lists any amount received during the academic year under consideration. The allocation section lists allocations made to support the administrative activities and research projects.

4.9.1 CRiST income

CRiST receives funds in varying amounts from the following sources:

1. Industrial affiliates
2. Government: central and state

3. Universities that are CRiST sites
4. States that host CRiST sites.

The income statement must clearly indicate the amount received and its source.

4.9.2 CRiST expenditure

Expenditure of CRiST funds falls into three categories: research, administration, and research coordination. Various categories of administration and research coordination expenses are listed in Table 2. Funds given to CRiST researchers, based on the recommendation of the IAB and the center coordinator constitute research expenditure. Funds used to support the activities of the center coordinator and site coordinators constitute administrative expenditure. This latter expenditure includes salaries for secretaries, expenses for supplies, organizing IAB meetings, travel, and other miscellaneous categories. Salary, travel, and equipment for the CRiST research coordinator constitutes research coordination expenses.

4.9.3 Allocation for research

As mentioned earlier, funds allocated to individual Principal Investigators (PI's) for conducting IAB approved research are categorized as research expenses. The following factors, in order of priority, determine the allocation of funds to a research project: (i) results of the IAB voting procedure, (ii) funds available for allocation to research projects, (iii) enhancement funds available to the PI from an affiliate, and (iv) budget request from the PI. The center coordinator usually negotiates a suitable amount with the PI in consultation with the corresponding site coordinator. The total amount available for research during a CRiST year is at least 85% of the industrial funds. This is also referred to the 15-85 constraint.

4.9.4 Allocation for research coordination

Research coordination tasks are carried out by the Research Coordinator (RC) located at one of the three CRiST sites. All expenses towards the salary of the RC are paid from CRiST funds subject only to the 15-85 constraint. In the event funds from industrial fee are insufficient to support the RC, the central academic site is expected to meet the shortfall. Table 1 lists the responsibilities of the RC. No time estimates are provided for various tasks. From past experience acquired in operating CRiST, research coordination is assumed to be a full time job.

4.9.5 Auditing of CRiST accounts

All CRiST accounts will be audited annually by auditors authorized by the respective research members. Appropriate audited certificates will be made available to the Center Coordinator who will then provide a copy to the Chair Policy Board.

4.10 Budget proposal, approval, and funds transfer

A CRiST budget proposal is prepared by the center coordinator for approval by the policy board. The budget proposal is prepared twice a year corresponding to each IAB meeting. The

Table 2: Administrative and Research Coordination Activity Categories.

Category	Basis	Comments
Center coordinator (CC):	30% AY	The time given here is derived from past experience of the CRiST center coordinator and an hourly time log of CRiST center coordinator activities. It is computed based on (i) data from Table ??, (ii) that 1 month has 22 working days, and (iii) the center coordinator and site coordinators are academic year employees of their respective universities.
site coordinator (SD)	15% AY	The time given here is derived as described for the previous entry.
Secretary to CCand RC	Full time	Located at the center coordinator's site.
RC	Full time	Located at one of the three sites; performs duties related to CRiST as determined by the center coordinator in consultation with the site coordinators.
Travel	8 visits	Determined based at least one visit per year to each existing affiliate, at least one visit to each potential affiliate, and three CRiST related unplanned visits authorized by the center coordinator. The visits are shared by the center coordinator, Site coordinator, and the Research Coordinator. Whenever possible, a visit may be shared by a faculty researcher. It is also assumed that two visits are combined in each trip.
IAB meetings		Determined based on essential expenses that vary from site to site. Registration fees collected from participants pay for a part of the expenses.
Publications		Determined by the number of CRiST technical reports, four newsletters per year, and monthly mailings to affiliates.
Supplies and expenses		Includes phone charges, computing charges, CRiST office supplies, and other unforeseen expenses.

center coordinator is expected to prepare and submit to the policy board a budget proposal within 1 week of the last day of the IAB meeting. The policy board in turn will be given 15 days from the date the proposal is mailed by the center coordinator to each member of the policy board. Within this approval period of 15 days if no objection is received by the center coordinator from any member of the policy board the budget is considered approved. In case any objection is received, the center coordinator, in consultation with the site coordinators, will attempt to revise the budget to make it acceptable to the policy board.

4.10.1 Accounting

To provide timely financial information to the center coordinator and site coordinators, the RC maintains CRiST accounts at the project level. Specifically, the RC tracks the following items and provides quarterly reports to each site.

1. CRiST income: actuals and projected for the year under consideration.

2. Funds allocated to each CRiST project.
3. For each project, expenditure during the period (a) beginning when the project was initiated until the reporting period and (b) beginning at the start of the budget year until the reporting period.
4. Balance of CRiST funds, at each site, at the time of reporting.

The above CRiST income/expense quarterly report is provided in a specific format to be designed by the center coordinator and the RC and approved by the center coordinator and site coordinators.

4.10.2 Funds transfer

The Memorandum of Agreement between the primary academic sites (see Appendix H) allows for transfer of funds from one site to another. Any such transfer is requested by the center coordinator through the budget proposal. Once the proposal is approved, the transfer requested is effected by the site at which the CRiST funds are held. It is crucial that funds be made available to the PI soon after the budget is approved by the IAB. Failure to do so could result in significant affect the project schedule. The accounts personnel at the academic sites must arrive at an understanding to allow quick transfer of funds as per the memorandum of agreement signed by all member institutions.

4.10.3 Budget countdown

For smooth operation of CRiST it is desirable that the CRiST yearly budget be approved by the Policy Board as early during the CRiST budget year as possible. Table 3 lists the steps to be executed for the preparation of the CRiST yearly budget so that the budget is available within 30 days from the start of the CRiST budget year. Note that due to different “notice of withdrawal” dates, it impossible to accurately determine the industrial funds available at the start of the CRiST budget year. The procedure outlined here accounts for this fact by working with lower and upper bounds on funds availability.

5 Intellectual Property Rights and Publications

Management of intellectual property will be as per the articles laid out in the Industrial Affiliation Agreement and University Affiliation Agreement shown in Appendix ?? and Appendix ??.

6 Foreign Collaboration

CRiST may collaborate with companies and governments located outside India only upon the explicit approval of the IAB. The IAB will develop and authorize the use of any procedures required for establishment and continuation of such collaboration. Any amendments needed in the industrial and university agreements will also need to be approved by the IAB before companies outside of India can participate in center operations.

Table 3: Recommended Procedure for the Preparation of the CRiST Annual Budget.

Deadline	Task
FD – 15 days	The center coordinator receives from RC a “Funds Available” statement. This statement contains (a) lower and upper bounds funds availability during the coming budget year, (b) the source of such funds, and (c) list of likely affiliates during the coming year.
FD – 7 days	Members of the executive committee receive from center coordinator a proposal for the allocation of CRiST funds to admin and research.
FD + 4	The center coordinator prepares a budget proposal in cooperation with the executive committee. These proposals are based on, respectively, the lower and upper bounds on estimates of funds availability. Any disagreements amongst center coordinator and site coordinators, despite discussions, are resolved based on a majority vote.
BY+15	The center coordinator mails the budget proposal to members of the Policy Board. The approved proposal provides information on funds likely available to support research proposal approved during the next showcase meeting.
BY+30	Budget is considered approved if no member of the Policy Board raises any objection. If there is any objection the center coordinator will attempt to revise the budget. A revised budget, or the original one in case the center coordinator does not consider a revision necessary, will be mailed to the members of the Policy Board.
BY + 30	If a majority of the Policy Board accepts the budget, this becomes the approved budget. If a majority of the Policy Board does not accept the budget, the center coordinator will consult the Policy Board members individually to arrive at an acceptable budget.

FD: first day of the CRiST showcase. It is assumed that the showcase lasts a total of 2 days. BY: CRiST budget year starting on January 1.

Appendix A

Center for Research in Software Technologies

Proposal Abstract

Date: November 24, 2003

Proposal Title: Requirement Study toward Highly Reliable Software

New ☒

Principle Investigator: M.C.K. Yang

Renewal ☐

DESCRIPTION

A mathematical foundation for software reliability in a whitebox testing environment has been laid out. When the test efficiency, the program proficiency, and the operational profile variability are estimated, the reliability of the software can be computed. Thus, for a software to be very reliable, the test efficiency and the program proficiency have to be very high and the operational profile has to be very flexible. This proposal is to lay out the relationship between the three so that a user can determine which area needs to be improved in order to reach highly reliable software under limited resource.

RELATED WORK ELSEWHERE

- J. Musa's group at AT and T Bell laboratory
- B. Littlewood at City University of London
- J. M. Voas at Reliable Software Technologies Corporation

HOW OURS IS DIFFERENT

Our emphasis is on the statistical foundation in reliability estimation by any testing scheme. The new elements are; randomization of test cases, efficiency estimation of a testing scheme, and incorporation of well tested components in reliability estimation at maintenance stage.

RELATED WORK IN SERC

- A. P. Mathur at Purdue University

MILESTONES

- A tool with the software structure and target reliability as inputs and the requirements for test efficiency, program proficiency, and operational profile variability as outputs (12/94)
- Report on one experiment with a large software (5/95)

DELIVERABLES

- A requirement tool for reaching highly reliable software
- A report on examples in using the requirement tool

BUDGET SUMMARY

- P.I.'s salary (50% summer support) 8,300
- Graduate student (1/3 time, 9 month): 6,300
- Travel: 2,500
- Total: 17,100

POTENTIAL BENEFITS TO AFFILIATES

Our work is intended to benefit those who engage in software testing, maintenance, its quality assurance, and the optimal time of its release. It will provide new ideas for test selection, reliability estimation, and testable program writing.

B Format for project proposal (New or continuing)

Project Title
(Indicate whether new or continuing)

PI name and university affiliation
Co-PI name and university affiliation
(List all Co-PIs, do not list students and research engineers)

Date of Showcase
Area of proposed research:

1. Long term goal

Provide a one para description of the long term goals of the proposed research. These are goals expected to be realized in 3-5 years if this research continues to attract funding.

2. Project description

Limit this to at most 2 printed pages. Divide the description into suitable subsections.

3. List of activities, deliverables, and milestones

List major activities and the respective start and end dates. For each activity list any deliverable that might be produced at the end of the activity. Deliverables include prototypes, data, results of a survey, publications, new algorithm, performance evaluation, etc.

4. Benefit to affiliates

Indicate briefly and clearly how this research will benefit one or more CRiST affiliates.

5. Budget and justification

See Appendix ???. Provide a brief justification of each line item in the budget. For example, if money is asked to support travel, indicate the number of trips planned and the purpose of each trip.

6. References

List at most 5 references cited in project description and of direct relevance to this project.

C Format for project status report

Project Title
(Status Report)

PI name and university affiliation

Co-PI name and university affiliation

(List all Co-PIs, do not list students and research engineers)

Date of Showcase

Area of proposed research:

1. Long term goal

Reproduce the long term goals stated in the original proposal. Also list any changes to the long term goal that might have occurred during the conduct of research.

2. Progress summary

List each major activity mentioned in the project proposal. For each activity indicate whether or not the deadline has been met and the deliverables completed. Explain any delays.

3. Revised project schedule

Prepare a revised list of major activities and the respective start and end dates. For each activity list any deliverable that might be produced at the end of the activity. Deliverables include prototypes, data, results of a survey, publications, new algorithm, performance evaluation, etc. This section is needed only if the project is not on schedule

4. Expenses and justification

Using the budget given in the proposal, indicate expenses against each category. If the expenses exceed the amount allocated to the project then provide a brief explanation.

5. Project personnel

List names of all those who worked on the project regardless of whether or not they were paid from the project. For each person listed indicate the nature of responsibility assigned and the tasks completed.

D Format for project budget

Use this format to prepare and present your budget in Section ?? of the proposal. List only the relevant budget items. For example if it not proposed to hire a graduate student, then omit the corresponding line from the budget. "Overhead" indicates the amount that will be charged by the university to which the project PI is affiliated.

Period: August 1, 2003-July 30, 2004

Position	Number	Rate	Total
Research engineer	1	INR xxx/month	INR xxx (total amount)
Graduate student	2	INR xxx/month	INR xxx (total amount)
Travel		INR xxx/month	INR xxx (total amount)
Equipment		INR xxx/month	INR xxx (total amount)
Overhead		INR xxx	
Total		INR xxx	

E Income-Allocation-Expense statement

Income-Allocation-Expense Statement
Period Covered: June 1, 2003-May 31, 2004
Showcase: March 20-21, 2004 at IIT-Delhi

Income

Source	Amount	Comments
Balance forward	INR xxx	
Affiliate 1	INR xxx	
Affiliate 2	INR xxx	
⋮		
Affiliate k	INR xxx	
Government	INR xxx	
Other	INR xxx	
Total	INR xxx	

Allocation

To	Amount	Comments
Admin: Salaries	INR xxx	
Admin: Travel	INR xxx	
Admin: Misc	INR xxx	
Project 1	INR xxx	
Project 2	INR xxx	
⋮		
Project n	INR xxx	
Total	INTxxx	

Expense

Item	Amount	Comments
Item 1	INR xxx	
Item 2	INR xxx	
⋮		
Item q	INR xxx	
Total	INT xxx	

F Format for industrial request for proposal

Center for Research in Software Technologies (CRiST)
INDUSTRIAL REQUEST FOR PROPOSAL (IRFP)

Requesting Organization: Cyber-no-Space Corporation

BEWARE: This is only a sample.

Summary: Cyber-no-Space corporation is interested in sponsoring research into architectures of Netcentric applications. Successful research proposal will (a) aim at designing, developing, testing, and demonstrating an architecture useful for a variety of Netcentric applications that would run over the Internet via Cyber-no-Space corporation's ultra modern services and (b) propose cohesive research plan spanning over three years with deliverables at the end of each year.

Research Funding: INR 750,000 over 3 years.

Proposal Deadline: Monday October 14, 1996

Submit written proposals to: Mr. To be Announced
Research Coordinator
Center for Research in Software Technologies
Birla Institute of Technology and Science
Pilani, 333031

L^AT_EX files of proposals may also be emailed to **email address** or made available. For any assistance in preparing proposals please contact the Research Coordinator at the address above.

Instructions: All proposals must be submitted in the standard FORMAT FOR CRiST PROPOSALS available via VSERC at <http://www.purdue.edu/serc>. For more details on Cyber-no-Space Corporation see <http://www.doesnotexist.com>.

Direct all inquiries to: Dr. Virtual Representative vrep@cybernospace.nocom or call: 1-800-xxx-xxxx

G Industrial Affiliation Agreement

Center for Research in Software Technologies (CRiST

Industrial Affiliation Agreement

This Agreement is made by and between _____
(hereinafter called RESEARCH MEMBER), located in _____
and _____
(hereinafter called AFFILIATE) located in _____.

WHEREAS, the parties to this Agreement intend to join together in a cooperative effort to support an Industry/University Cooperative Center for Research in Software Technologies (hereinafter called CENTER) at the Birla Institute of Technology and Science, Pilani, Indian Institute of Technology, Delhi, and Indian Institute of Technology, Kanpur, (hereinafter called RESEARCH MEMBERS) to maintain a mechanism whereby the RESEARCH MEMBERS' environment can be used to develop a better understanding of software technologies and stimulate industrial innovation.

WHEREAS this program will strengthen the RESEARCH MEMBERS' research, teaching and service capabilities.

NOW, THEREFORE, for the mutual promises and covenants contained herein, the parties hereto agree as follows:

1. Center Organization: RESEARCH MEMBERS agree that the personnel and facilities required for the CENTER will be made available through the RESEARCH MEMBERS. The CENTER shall be operated by the RESEARCH MEMBERS under the leadership of a Center Coordinator. The CENTER will be supported jointly by various private and public sponsoring organizations, including AFFILIATE, central and state governments, and RESEARCH MEMBERS.
2. Affiliate Membership: Any company incorporated in India or a partnership in India or any agency of government, government office, or government organization duly authorized by the Government of India or the government of any State of India may become a SPONSORING AFFILIATE of one or more research projects (hereafter called PROJECT/S) for the CENTER.
3. Affiliate Representative: Each AFFILIATE agrees to appoint an individual to serve as the AFFILIATE REPRESENTATIVE to the Industrial Advisory Board. The AFFILIATE REPRESENTATIVE is identified at the end of this Agreement and shall serve in that capacity until a replacement is named in a written modification to this Agreement.
4. Membership Fees: AFFILIATE agrees to pay an annual fee as indicated below:
 - (a) SPONSORING AFFILIATE: Two hundred Thousand Indian Rupees (INR 200,000.00) annually for one (1) year in support of CENTER to become/remains a SPONSORING

AFFILIATE of the PROJECTS;

- (b) Payment of Membership Fees: Upon execution of this Agreement, payment will be made within thirty (30) days of final signature of this Agreement. The payment due will be either the full amount or the first payment due in accordance with one of the payment schedules indicated below:

Annual payment with one payment being due _____
20_____

Biannual payments, the first payment due: _____ 20_____

- (c) Where to Send Payments: Checks shall be made payable as indicated below to the RESEARCH MEMBER that is the AFFILIATES primary contact. The RESEARCH MEMBERS addresses for receiving payments is listed below:

Birla Institute of Technology and Science

Attn: Mr. Mohan Lal, Budget Officer

Pilani, Rajasthan 333031

India

5. Use and Distribution of Membership Fees:

- (a) Distribution of each INR 200,000.00 Membership Fee:

At most INR 30,000.00 will be used for Administration of the CENTER.

At least INR 170,000.00 will be used for sponsoring PROJECTS. The AFFILIATE may designate, at its sole discretion, the PROJECT into which its funds are to be directed. Some PROJECTS may require Enhancement Funding. Some Projects may be funded jointly by two or more affiliates.

- (b) Expenditure and Use of Funds: Expenditures will be in accordance with the policies of the RESEARCH MEMBER conducting a PROJECT. PROJECT expenses may include, but will not necessarily be limited to: capital purchases, start-up expenses, support of post-doctoral and graduate fellowships, technology transfer, and publications.

- (c) Title to Equipment: Equipment acquired by a RESEARCH MEMBERS for the conduct of a CENTER PROJECT will become the property of that RESEARCH MEMBER. Any funds not expended during the membership year will be carried forward to the next year.

6. Term of Agreement and Termination: This Agreement is valid for a period of one (1) year from the date of last signature to this Agreement (ANNIVERSARY DATE) and shall renew automatically each year on the ANNIVERSARY DATE, unless the AFFILIATE submits a written notice of termination to the CENTER Center Coordinator at least ninety (90) days prior to the ANNIVERSARY DATE. Payment of annual dues, either the full amount or the first installment indicated in Article 4b (Payment of Membership Fees) shall be due each year within thirty (30) days of the ANNIVERSARY DATE. Such termination shall be subject to Article 6(3) (Termination and Effect on Rights). The

CENTER is obliged to return to the affiliate concerned at most 85% of the membership fee paid to the center by the affiliate terminating the agreement. Any funds approved by the Policy Board for allocation for research and administration prior to the termination will not be returned to the affiliate.

7. Operation of the CENTER: The organization and operation of the CENTER shall be in accordance with all applicable Center and State laws.
8. Industrial Advisory Board: An Industrial Advisory Board comprised of one (1) AFFILIATE REPRESENTATIVE from each AFFILIATE, shall advise the Center Coordinator regarding the by-laws of the Industrial Advisory Board. This Industrial Advisory Board shall advise the Center Coordinator concerning the following:
 - (a) The research projects to be implemented by the PROJECTS conducted by the CENTER;
 - (b) The apportionment of resources to these PROJECTS;
 - (c) PROJECTS to be conducted by the CENTER;
 - (d) Changes in operating procedures and policies;
 - (e) Industrial/Intellectual property protection.
9. Intellectual Property: It is anticipated that development leading to commercially viable products/processes will generally be performed by industrial firms rather than the CENTER. However, if new technology consisting of copyrightable or copyrighted materials and patentable or patented intellectual property (hereafter Intellectual Property) is developed through CENTER PROJECTS, the following policies shall apply:
 - (a) Ownership of Intellectual Property:
 - (a) Research Member Intellectual Property: Title to Intellectual Property first actually reduced to practice solely by one of the RESEARCH MEMBERS in the course of research conducted under the CENTER, shall be vested in that RESEARCH MEMBER.
 - (b) AFFILIATE Intellectual Property: Title to Intellectual Property developed by an employee of AFFILIATES organization solely as a direct result of such employees participation in a PROJECT of the CENTER shall be vested in the AFFILIATE.
 - (c) Joint Intellectual Property: Title to Intellectual Property conceived or first actually reduced to practice jointly by two or more RESEARCH MEMBERS, or by employees of both the RESEARCH MEMBER and the AFFILIATE, in the course of a PROJECT conducted under the auspices of the CENTER, shall vest jointly with the developing parties.
 - (b) Intellectual Property Rights to AFFILIATES
 - (a) Non-Exclusive Licenses: RESEARCH MEMBERS shall grant to any interested AFFILIATES an irrevocable, non-exclusive, royalty-free license for AFFILIATES

in-house noncommercial use of any Intellectual Property developed by RESEARCH MEMBERS under the auspices of the CENTER and which is not the subject of an exclusive license to another AFFILIATE. At the request of the AFFILIATE, the RESEARCH MEMBER will negotiate with the AFFILIATE an irrevocable, non-exclusive, royalty-bearing license for external use of such Intellectual Property.

(a) (1) Patent Costs: If AFFILIATE exercises its right to a non-exclusive license to newly developed Intellectual Property, AFFILIATE shall inform RESEARCH MEMBERS within 90 days following disclosure, and AFFILIATE shall pay its pro rata share of patent application, prosecution, and maintenance costs, or copyright registration costs. AFFILIATE and RESEARCH MEMBERS will cooperate in deciding on whether to file patent applications or copyright registrations, the countries in which such applications or registrations are to be filed, and which party will assume responsibility for filing and prosecuting such applications or registrations.

(b) Exclusive Licenses: AFFILIATE may request a limited exclusive license to Intellectual Property developed by a RESEARCH MEMBER under the auspices of the CENTER. RESEARCH MEMBERS agree to consider such requests within 90 days of submission thereof, provided that no other company exercises its right to a non-exclusive license and to negotiate with AFFILIATE on terms and conditions for an exclusive, royalty-bearing license.

(b) (1) Patent Costs: RESEARCH MEMBER shall have the right to designate, at its sole option, a patent attorney in private practice to prepare, file and prosecute patent applications, and AFFILIATE requesting an exclusive license shall bear the cost to prepare, file, prosecute and maintain the patent application/patent on each such invention.

(b) (2) Failure to Commercialize/Utilize Intellectual Property: RESEARCH MEMBER shall have the right at any time after one (1) year from the grant of each such exclusive license to require a written report reflecting the AFFILIATES commercialization and/or utilization of the Intellectual Property. The RESEARCH MEMBER shall terminate the exclusivity of the license agreement if the AFFILIATE fails within ninety (90) days after receipt of the written notice from the RESEARCH MEMBER to provide a written report reflecting the commercialization and/or utilization of the Intellectual Property, or satisfactory progress in the efforts to commercialize and/or utilize the Intellectual Property that is the subject of such exclusive license.

(b) (3) Termination and Effect on Rights: AFFILIATE may terminate its status as a AFFILIATE at any time by providing written notice to CENTER, in accordance with Article ?? (Term of Agreement and Termination) and, upon doing so, shall forfeit all rights to an exclusive license. In the event of such termination, the AFFILIATE shall be responsible for its share of the patent-related expenses incurred or obligated prior to submission of the notice to CENTER. CENTER shall promptly notify the remaining AFFILIATES in writing of an AFFILIATES intention to dis-

continue participation.

- (c) Sublicenses: AFFILIATE shall have the right to license the rights set forth in Articles 9b.a and 9b.b to AFFILIATES wholly-owned subsidiaries and divisions, provided that such sublicenses shall be subject to the terms and conditions of the license granted to AFFILIATE by the RESEARCH MEMBER. AFFILIATE agrees to report to the RESEARCH MEMBER the name and address of each subsidiary or division receiving a sublicense and the date of issuance of the sublicense. A copy of each sublicense will be provided to the RESEARCH MEMBER within sixty (60) days of issuance.
 - (a) Third Party Sublicenses: There shall be no right under this Agreement to grant sublicenses to any third parties other than the AFFILIATES wholly owned subsidiaries and divisions, unless third party license is approved by the RESEARCH MEMBER.
- (d) Licensing to NON-AFFILIATES: RESEARCH MEMBERS may negotiate license agreements with companies that are not affiliates of the CENTER. Such license agreements shall be at terms less favorable than those negotiated with AFFILIATES and shall be royalty-bearing.
- (e) Disclosure: Intellectual Property developed under a PROJECT shall be promptly disclosed to CENTER and SPONSORING AFFILIATES on a confidential basis. RESEARCH MEMBER shall file for and prosecute patent applications if patent protection is desired by RESEARCH MEMBER, CENTER and/or SPONSORING AFFILIATES. Each SPONSORING AFFILIATE shall have thirty (30) days from receipt of the RESEARCH MEMBERS invention disclosure to notify the RESEARCH MEMBER of that AFFILIATES interest in acquiring license rights beyond those provided under Article 9.a and a willingness to support the cost of patent filings.
- (f) Declination of Patent Protection: Should all AFFILIATES decline patent protection on any Intellectual Property resulting from a PROJECT, the RESEARCH MEMBER/S participating in the PROJECT may, at its/their own expense, pursue patent protection for that Intellectual Property. In these cases, AFFILIATES shall retain the internal use license as stated in Article 9b.a; however, RESEARCH MEMBER/S may license the technology for commercial purposes without any obligation to AFFILIATES.
- (g) Delays in Licensing: RESEARCH MEMBERS agree to a delay in licensing to a SPONSORING AFFILIATE for a period of six (6) months following the disclosure of copyrightable materials or patentable inventions to sponsoring companies participating in the CENTER.
- (h) Educational and Research Use: RESEARCH MEMBERS and their investigators shall be free at all times to use for educational and research purposes any Intellectual Property as described in Article 9a (Ownership of Intellectual Property), subject to Article 9, resulting from the PROJECTS, including Intellectual Property that has been licensed on an exclusive or non-exclusive basis; however, they shall not

commercially exploit or permit commercial exploitation by a third party.

10. Publication: Publication of research results is of fundamental importance to universities, faculty members and their PROJECTS. Therefore, RESEARCH MEMBERS reserve the right to publish in scientific journals the results of all research performed at the CENTER, giving due consideration to scheduling such publications in order to allow time for obtaining appropriate patent or copyright protection for any patentable invention or copyrightable materials that might result from the research.
 - (a) Delay of Publication: RESEARCH MEMBERS agree to provide a copy of all manuscripts resulting from PROJECTS to SPONSORING AFFILIATE REPRESENTATIVES on the Industrial Advisory Committee for review ninety (90) days prior to submission for publication. SPONSORING AFFILIATES may request delay of the proposed publication for a period not to exceed six (6) months from the date of submission to the SPONSORING AFFILIATE. SPONSORING AFFILIATE agrees to request said delay only in order to permit the filing of appropriate documents (e.g., patent applications, copyright registrations, etc.) on any patentable invention or copyrightable materials made by the CENTER; and SPONSORING AFFILIATE must make said request in writing, including justification thereof, within thirty (30) days from the date the proposed publication was received by SPONSORING AFFILIATE. Should the proposed publication be a student thesis or dissertation, RESEARCH MEMBERS and SPONSORING AFFILIATE hereby agree to use their best efforts to complete all reviews of material contained therein and any necessary property protection filings so as to not impede the completion of activities to satisfy graduation and/or degree requirements by such a student. However, the provisions of this Article shall not be applied by any party so as to impede or delay the academic progress of any student.
11. Use of Names: AFFILIATE shall not use the names, logos or trademarks of any of the RESEARCH MEMBERS or the CENTER, or the names of any of their employees or students, in any advertising or promotional material without the specific written consent of the University whose name the AFFILIATE proposes to use. In the event of such use of the name of the CENTER, the written consent of all RESEARCH MEMBERS is required. Written requests for approval, accompanied by copies of all materials requiring approval, shall be submitted to the appropriate Administrative Contact identified in Article 18(Notices). A general exception is hereby granted to AFFILIATE to use the name of the CENTER and to cite the fact that the CENTER is operated by Birla Institute of Technology and Science, Pilani, Indiana Institute of Technology, Delhi, and Indian Institute of Technology, Kanpur, in written publicity and other promotional materials provided that:
 - (a) Such use is limited to describing the AFFILIATE relationship to the CENTER, as herein defined by this Agreement;

- (b) No endorsements by the CENTER, Birla Institute of Technology and Science, Pilani, Indiana Institute of Technology, Delhi, and Indian Institute of Technology, Kanpur, of AFFILIATE products or other commercial activities may be reasonably inferred from such use;
 - (c) Such use does not represent that a partnership, joint venture or other legal entity has been formed between and among the parties to this Agreement;
 - (d) Similarly, RESEARCH MEMBERS are prohibited from using any of the trade names or trademarks, or logos whether registered or unregistered, belonging to an AFFILIATE, for any purpose whatsoever, without its prior written authorization;
12. Independent Contractor Status: The relationship between an AFFILIATE and RESEARCH MEMBERS shall be that of independent contractor; this Agreement shall not bind either RESEARCH MEMBERS or the CENTER as agents or legal representatives of AFFILIATE. RESEARCH MEMBERS assume all risk and liability, to the extent permitted by applicable National laws, Statutes, for injury to persons or damage to property occurring during the period of the agreement and caused by the acts of its employees, agents and students while performing work under the terms of this Agreement. The obligations of RESEARCH MEMBERS hereunder shall not apply to liability arising from use of information furnished pursuant to this Agreement.
 13. Entire Agreement: The provisions contained herein constitute the entire Agreement and supersede all previous communications or representations, either verbal or written, between the parties hereto with respect to the subject material hereof. This Agreement may not be changed, altered, or supplemented except by written amendment hereto, signed by all parties. It is further agreed that nothing contained in the agreement shall modify, amend, or supersede any prior or subsequent arrangement between AFFILIATE and the RESEARCH MEMBERS with respect to activities outside the scope of this Agreement.
 14. . Governing Law: The validity, construction and effect of this Agreement shall be governed by the laws prevalent in India.
 15. Liability: The liability of CENTER, as an entity of Birla Institute of Technology and Science, Pilani, a private deemed university located in the state of Rajasthan, for bodily injury, property damage, infringement of proprietary rights and patents, and other items is limited by the relevant laws prevalent in India.

AFFILIATES will indemnify and hold harmless RESEARCH MEMBERS, their employees, officers, trustees and agents from and against any liabilities, damages, or claims (including attorneys fees) arising out of injuries
 16. Breach of Contract: In the event of violation or breach of contract terms, both parties will make a good faith effort to take necessary remedial actions to correct said breach. However, nothing in this Agreement shall constitute a waiver by Birla Institute of Technology and Science or Subgrantee of any rights to pursue any applicable administrative, contractual, or legal remedies in instances where the other party violates or breaches contract terms.

17. Modification: This Agreement and attachments hereto contain the entire agreement between the parties. All modifications must be in writing and signed by the duly authorized officials of each party. No oral agreement or conversation with any officer or employee of either party shall affect or modify any of the terms and conditions of this Agreement. Requests for modification must be submitted in writing to the Centers Administrative Contact as identified in Article 18 (Notices).
18. Notices: Any official notice, invoice, and other correspondence between the parties under this Agreement shall be in writing and delivered by no less than First Class U.S. Mail service or facsimile transmission addressed to the other party's administrative contact as follows:
- CRiST Administrative Contact Affiliate Administrative Contact
Mohan Lal
Budget Officer
Birla Institute of Technology and Science
Pilani, 333031, India
Phone: (765) 285-5289 Phone:
Fax: (765) 285-5224 Fax:
19. Non-assignment: This Agreement shall not be assignable by either party without the prior written consent of the other party

IN WITNESS WHEREOF, this Agreement is effective as of the date of last signature set forth below, which day and month in subsequent years in which AFFILIATE adheres to the terms of this Agreement shall be called the anniversary date of this Agreement.

Research Member: _____

Date:_____

Title:_____

Industrial Affiliate _____

Date:_____

Title:_____

Date Sponsorship is to Become Effective (Select one):

October 1, 20____ January 1, 20____ April 1, 20____ July 1, 20____

AFFILIATE Representative to Industrial Advisory Board (as described in Article 3):

Name: _____

Title: _____

Address: _____

City: _____ State: _____

Pin: _____

Phone: _____

Fax: _____

Email: _____

H University Affiliation Agreement

Center for Research in Software Technologies

University Affiliation Agreement

This University Affiliation Agreement is effective the _____ day of _____, 20____ by and among (1) Birla Institute of Technology and Science (hereinafter referred to as “BITS”) located in Pilani in the state of Rajasthan, and (2) each of the undersigned universities:

WHEREAS BITS, a deemed university has established in 2003 an operating entity known as The Center for Research in Software Technologies (hereinafter referred to as “CRiST”) for the purposes of performing research into scientific and engineering aspects of computer software technology.

WHEREAS the activities of CRiST are funded by (1) The Central and State Governments of India (2) Industrial Members, and (3) other funds that may be received from time to time.

WHEREAS CRiST has been in continuous operation since its establishment and BITS, Indian Institute of Technology, Delhi, and Indian Institute of Technology, Kanpur, have made and observed certain agreements and conventions between them with respect to the subject matter contained herein.

WHEREAS BITS, Indian Institute of Technology, Delhi, and Indian Institute of Technology, Kanpur, are desirous of formalizing and memorializing these agreements and conventions.

WHEREAS each of the undersigned universities in addition to BITS, Indian Institute of Technology, Delhi, and Indian Institute of Technology, Kanpur, are desirous of joining such agreements and conventions.

NOW THEREFORE, for, and in consideration of, the mutual promises and covenants herein contained and intending to be legally bound the parties hereto agree as follows:

1. Definitions

- (a) “Research Member” is defined as BITS, Indian Institute of Technology, Delhi, and Indian Institute of Technology, Kanpur, as well as any college, university or affiliated research corporation that subsequently joins this Agreement for the purposes of participating in the activities of CRiST.
- (b) “Institution” shall refer to BITS, Indian Institute of Technology, Delhi, and Indian Institute of Technology, Kanpur, or any of the colleges or universities on whose behalf a Research Member joins this agreement as the context so requires.
- (c) “Industrial Member” is defined as any company, corporation, agency or organization that: (1) has joined and been accepted as a sponsor of CRiST by signing an “Industry/University Cooperative Center for Research in Software Technologies” (hereinafter referred to as “The Affiliation Agreement”) that has been signed by authorized institutional representatives of the Research Members and (2) has paid

annual fees to sponsor research activities in CRiST pursuant to said agreement. An Industrial Member is deemed to be "current" unless such Member is in violation of its Affiliation Agreement by failing pay annual fees according to the terms of its Affiliation Agreement or by violating any other provision of said agreement and has taken no steps to remedy the violation.

- (d) "Industrial Advisory Board" (hereinafter referred to as "IAB") shall refer to a board comprised of one representative appointed by each of the Industrial Members and designated in that member's signed Affiliation Agreement, which designation may be changed from time to time at the written request of the Industrial Member.
 - (e) "CRiST Policy Board" (hereinafter referred to as "CPB") shall refer to a board comprised of (1) Center Coordinator, (2) Site Coordinators of each of the primary institutions, (3) the current and past chairs of the IAB, and (3) one representative from each of the government agencies that fund CRiST.
 - (f) "Inventor" is defined as the discoverer of any patentable invention, the author of any copyrightable work, or the author of any licensable computer program.
 - (g) "Intellectual Property" is defined to be (1) all inventions, discoveries or patentable ideas conceived or reduced to practice as well as (2) all computer software and copyrightable material or data developed during the term of this agreement.
 - (h) "Royalty Income" is defined as all income of any kind received in exchange for a license to use any Intellectual Property.
 - (i) Intellectual Property Costs" shall refer to all costs directly associated with a particular Intellectual Property including, without limitation, patent application charges, attorneys' fees, costs of outside evaluation, patentability searches, preparing patent applications, preparing assignments, applications, obtaining the issuance of patents, maintaining patents, preparing license agreements, recording license agreements, preparing security agreements, recording security agreements, travel, administrative proceedings such as interferences and appeals within any agency or office, litigation such as actions for royalty collection, infringement, product liability, antitrust or the like including prosecution or defense of same and compromise, settlement and judgment satisfaction of same; the foregoing costs include but are not limited to attorneys' fees, agency and office fees, court costs and judgment satisfactions.
 - (j) "Normal Operating Procedures" are defined by the currently approved edition of the manual "CRiST Operating Procedures and Guidelines" which, in addition to administrative and technical practices and procedures, additionally documents CPB and IAB by-laws and the amendments to such practices, procedures and by-laws that may be made from time to time by vote of the IAB, CPB or Executive Committee or by administrative action of the Center Coordinator.
2. Promotional Material. No Research Member shall authorize or commission the publication of any promotional materials containing any reference to the other Research Members without the prior written approval of the other Research Member. It is provided, however, that each Research Member may include any Other Research Member's name and

Research Projects titles in published material intended to enroll new Industrial Members, communicate research results and other information about CRiST to current Industrial Members or disseminate scientific facts and findings in accordance with customary research practices.

3. CRiST Policy Board. The CPB shall recommend the appointment of the CRiST Center Coordinator and Site Coordinator(s) to the Institutions, annually review the performance of the CRiST Center Coordinator and Site Coordinator, including input using a process defined by the CPB and the IAB, and ensure that appropriate Institutional policies are defined and enforced to enable the conduct of the CRiST research programs and make recommendations to the Institutions on other matters as required.
4. Management of CRiST. The CPB with advice from the IAB will recommend to the appropriate Institution the appointment of a CRiST Center Coordinator. The CRiST Center Coordinator serves in this capacity at the pleasure of the CPB. The CRiST Center Coordinator shall be the primary decision-maker for the CRiST and shall have responsibility and authority for all aspects of CRiST's operation and performance. Specific responsibilities of the CRiST Center Coordinator shall include, but not be limited to, soliciting research proposals, conducting peer reviews, determining funding levels for Research Projects based upon recommendations from the IAB, and providing accurate and timely financial information to the IAB and the Site Coordinators. In matters of policy, the CRiST Center Coordinator shall receive guidance from and report to the CPB. The CRiST Center Coordinator shall be the principal interface between the academic members, the Industrial Members, members from the central and state governments, and the IAB.
5. Center funds. Affiliation fees from industrial and governments will be sent to the Research member that hosts the Center Coordinator. This Research member will be responsible for maintaining all accounts related to the receipt and expenditure of center funds. Transfer of funds, as per Paragraph 10 will also be the responsibility of this Research member.
6. Site Coordinators. With the approval of the CPB and the advice of the CRiST Center Coordinator and the IAB, each Institution may select a Site Coordinator. In addition to duties specified herein above the CRiST Center Coordinator shall serve as the Site Coordinator at the Institution in which his or her academic appointment is held. The Site Coordinators serve in this capacity at the pleasure of the CPB. In matters related to the operation of CRiST, the Site Coordinators shall report to the CRiST Center Coordinator. Specific responsibilities of the Site Coordinators shall include, but not be limited to, encouraging and assisting in the preparation of new research proposals, ensuring quality in the supported Research Projects, providing accurate and timely financial information from the Institution to the CRiST Center Coordinator, managing CRiST administrative funds allocated to such, collecting, reviewing and forwarding research proposals and technical reports to the CRiST Center Coordinator and other Site Coordinators and hosting the meetings of the IAB that occur at such Institutions.
7. Executive Committee. The CRiST Center Coordinator and the Site Coordinators shall

comprise the CRiST Executive Committee. The Executive Committee shall have responsibility for implementing plans and procedures that support, facilitate and enhance CRiST operations and capabilities. Specific responsibilities of the Executive Committee shall include, but not be limited to, recruiting new affiliates, recommending administrative budgets at each Institution, consulting with researchers and the IAB regarding policy decisions, disseminating operational and financial information to the researchers and the IAB, and recommending research funding levels to the CRiST Center Coordinator based on IAB guidance.

8. Administrative Support and Reporting. The CRiST Center Coordinator with the advice of the Executive Committee and the IAB shall determine the requirements and administrative funding levels for CRiST as a whole. Administrative expenses for Site Coordinators are to be met by the respective Research members. In certain cases, as determined by the Executive Committee, the Center Coordinator may reimburse Research Members expenses incurred towards center management. The CRiST Center Coordinator shall also determine the reporting arrangements for administrative support personnel and shall report financial information at each IAB meeting to the IAB and Site Coordinators following procedures and formats defined and approved by the CPB.
9. Distribution of Research Funds. Funds shall be allocated by the CRiST Center Coordinator for the support of Research Projects as per the recommendations of the IAB.
10. Transfers of Funds between Institutions. The CRiST Center Coordinator shall prepare and submit to the CPB an allocation recommendation for Research Projects funding that includes (1) an accounting of *all* funds available for allocation to CRiST projects subject to the provisions defined herein above, and (2) a funds transfer plan that specifies how the total pool of funds available for allocation to CRiST projects shall be allocated to individual Research Projects. Such accounting of funds available for allocation shall include from each Institution, where the center funds are held, a certification by an authorized institutional representative of available funds. Such funds transfer plan shall include directions for transferring funds that have been certified to be available between Research Members in order to ensure that adequate funds are available at each Institution to support the approved and authorized Research Projects at such Institution. Upon acceptance of such allocation recommendation by the CPB, the Research Members shall subcontract or otherwise cause the transfer of appropriate funds to other Research Members if directed to do so by the funds transfer plan.
11. Authorized Expenditures. No Research Member shall expend, obligate or otherwise remove from the total pool of funds available for allocation to CRiST Research Projects or CRiST administrative functions, any funds collected from Industrial Members except as authorized by the funds transfer plan defined herein above.
12. Timely and Expedient Transfers. Research Member designated to hold funds for CRiST administration and Research Projects shall transfer funds to other Research Members by an approved funds transfer plan as defined herein above shall complete such transaction in

a timely fashion. In carrying out said transfers of funds, Research Members must satisfy the fiscal transaction requirements established by their respective institutions and central government and state laws.

13. Termination. Each Institution shall remain a Research Member for so long as: (1) CRiST continues to function, and (2) such Institution is actively conducting research pursuant to this agreement. Any Research Member may resign upon giving thirty (30) days written notice to each other Research Member Affiliation Agreements to which the terminated Research Member is a party, even if enrolled by such Research Member, remain binding on the Industrial Member and the remaining Research Members. Upon resignation, a Research member is required to submit to the IAB, through the Center Coordinator, a report on unspent funds. Any such funds should be returned within 60 days of termination to the Research Member responsible for holding center funds.
14. Ownership of Intellectual Property. Subject to the rights of the Industrial Members, all rights, title, and interest in and to all Intellectual Property shall be as follows:
 - (a) All Intellectual Property conceived and/or developed solely by one Research Member shall belong solely to that Research Member.
 - (b) All Intellectual Property conceived and/or developed jointly by personnel of two or more Research Members will belong to each such Institution. For purposes of sharing income or other financial rewards from joint sale or licensing of said Intellectual Property, each owner shall share in proportion to the percentage contribution of the Inventors from each Institution. If the Inventors cannot agree among themselves as to their proportionate contribution in the Intellectual Property, then the CRiST Center Coordinator shall attempt to mediate the dispute. In the event that the Inventors cannot then agree as to the proportionate contribution of each Inventor then the Inventors shall be deemed to have contributed in equal shares to the Intellectual Property.
15. License to Use Intellectual Property for Internal Use. Each Research Member agrees to and does hereby grant to each of the other Research Members, subject to the terms of this agreement and subject to restriction of any sponsor, a non-exclusive, nontransferable, royalty-free license (without the right of sublicense) to (1) utilize any information and materials published by CRiST and (2) practice any invention resulting from research funded in whole or in part from fees paid by Industrial Members during this or any subsequent term of this agreement for educational and research purposes only. Such licenses are granted in addition to licenses granted by the Research Members to Industrial Members (1) by a valid Affiliation Agreement or (2) by separate agreements executed between Research Members and Industrial Members pursuant to paragraph 9 of the Industrial Affiliation Agreement.
16. Center Publications. Subject to normal CRiST operating procedures for approval and distribution of reports and research products, all manuscripts being submitted for publication

shall have the prior approval of the Center Coordinator, or, at the Center Coordinator's discretion, the Site Coordinator(s) from the author(s) Institution(s).

17. Publication, Sale and or Use of Research Results on Jointly Owned Intellectual Property

- (a) Subject to CRiST Affiliation Agreements and Normal Operating Procedures for review and approval for unlimited distribution of research reports by Industrial Members, each Institution shall have the right to publish research results on jointly owned intellectual property. It is provided, however that the Institution desiring to publish such research results shall submit a draft of any such proposed publication to the other Institution(s) with whom ownership of such Intellectual Property is shared at least thirty (30) days prior to the submission of the research results for publication. All partial or complete copies of such drafts shall bear the proprietary notations and labels specified by Normal CRiST Operating Procedures. Within this thirty day period and with good reason, any party shall have the right to further delay any publication for a period of not more than six (6) additional months by making an appropriate notation in the "Limited Distribution Review Copy" legend of such draft and returning the annotated legend to the CRiST Center Coordinator. For purposes of this Memorandum of Agreement, the following shall be deemed to be "publication": (1) cataloging and placing reports of research results in the library of any Institution, (2) electronic distribution of such reports and computer software in a form suitable for execution on a computer through public bulletin boards and file transfer Center Coordinatories.
- (b) No party shall conduct any activity or knowingly allow any activity to be conducted that would constitute a bar against filing a foreign or domestic patent without first giving the other parties sixty (60) days prior written notice.
- (c) All jointly owned Intellectual Property is deemed to be "Proprietary Information". Except as otherwise provided herein, each party agrees to keep all Proprietary Information confidential for a period of three (3) years from its date of disclosure. Each party shall protect and avoid disclosure of jointly owned Proprietary Information with the same degree of care it uses to protect and avoid disclosure of its own Proprietary Information. The obligation of nondisclosure shall not apply if:
 - such information is, at the time of disclosure, in the public domain or such information thereafter becomes a part of the public domain with a breach of this Agreement by any party; or
 - such information is known to the receiving party at the time of disclosure; or
 - such information is independently developed by the receiving party; or
 - such information is received by the receiving party from a third party who had a lawful right to disclose such information to the receiving party; or
 - such information is disclosed with the written approval of the parties; or
 - such information is obligated to be produced by the receiving party under the order of a court of competent jurisdiction or pursuant to state or federal law.

18. Proprietary Nature of Research Proposals, Financial Reports and Planning Documents. Research proposals, whether funded or not, research and administrative budgets, income and expense statements, other statements of financial status, lists of prospective Industrial Members, planning documents that assess Industrial Member research needs, technology transfer plans, the annual report of the Center Evaluator and other documents that bear proprietary legends and markings are deemed to be Intellectual Property with ownership rights as defined herein above. All such Property is deemed to be Proprietary Information and each Research Member shall protect and avoid disclosure of such Information with the same degree of care it uses to protect and avoid disclosure of its own Proprietary Information subject to the obligations and exceptions noted in Paragraph 17c above.
19. Administration of Intellectual Property. Any Intellectual Property conceived or developed solely by one of the parties to this Agreement shall be administered solely by such party. Any Intellectual Property conceived or developed jointly by two or more Research Members shall be administered as hereinafter set forth. In the event that one Institution has contributed greater than any other Institution to the Intellectual Property, that Institution shall administer the Intellectual Property. In the event the Institutions have contributed equally to an Intellectual Property then the Center Coordinator shall determine who shall administer the Intellectual Property. The Institutions shall jointly review any Intellectual Property, evaluate its commercial potential, and may enter into confidential nondisclosure agreements with third parties for the disclosure of the Intellectual Property. If one Institution elects to proceed with a patent application or other commercialization of the Intellectual Property and the other Institution elects not to proceed with a patent application or other commercialization of the Intellectual Property, then the Institution that has elected not to proceed with a patent application or other commercialization of the Intellectual Property shall receive ten percent of any royalty income received from such commercialization but shall incur no Intellectual Property Costs and shall have a perpetual, non-exclusive, royalty-free license, without the right to sublicense, to practice or use any Intellectual Property for educational or research purposes. The parties further agree to cooperate with each other with any administrative or court proceedings involving any Intellectual Property. The party responsible for the administration of any Intellectual Property shall substantially comply with all enforceable regulations and valid agreements pertaining to that Intellectual Property.
20. Division of Royalty Income. The Institutions shall negotiate in good faith to set Royalty Fees for any jointly owned Intellectual Property. All Intellectual Property Costs of jointly owned Intellectual Property shall be borne by each Institution in relation to their proportionate interest in the Intellectual Property. All Royalty Income shall be shared by each Institution in proportion to their respective interest in the Intellectual Property. All such Royalty Income shall be distributed at least semi-annually within sixty (60) days after the end of the half fiscal year of the administering Institution. Each Institution shall be responsible for paying royalties to the Inventors of its Institution in accordance with its Intellectual Property Policy. The Institution administering any Intellectual Property shall keep the other Institution advised as to the activities in administering the Intellectual

Property including any progress on commercialization, patent prosecution, or copyright protection. All such information received by either Institution shall be deemed confidential.

21. Equipment Procurement and Title to Equipment. Any capital equipment whose total purchase price exceed INR 30,000.00 purchased with CRiST funds shall require the approval of the Center Coordinator, who may at his or her discretion seek the advice of the IAB. Unless otherwise agreed in writing, all right, title, and interest in and to said equipment purchased with CRiST funds shall remain with the Research Member conducting the research or the administrative function for which the equipment was purchased.
22. Partnership not Intended. Any language herein that tends to indicate the formation of any partnership, joint venture or any other form of legal entity between or among the Members, BITS and the University of Florida has been used for convenience only. The Industrial Members have jointly sponsored research to be conducted by CRiST. CRiST is not a legal entity. Research Members may subcontract all or part of this research work to other Research Members. Although the Industrial Members shall share in any research results, no partnership, joint venture, or any other form of legal entity is intended to be formed between or among any Industrial Members.
23. Agreement Executed in Counterparts. This agreement may be executed in several counterparts each of which is deemed an original and which together constitute one and the same agreement.
24. Notices. All notices acquired and desirable hereunder shall be given by first class certified mail, postage prepaid to the following address or other such address as shall be designated in writing by the parties from time to time:

For All CRiST matters:

Dr. V. S. Rao

Deputy Director

Birla Institute of Technology and Science

Pilani, 333031, India

25. General Provisions.

- (a) This Agreement contains the entire understanding between and among the parties with respect to the subject matter hereof and any representation, promise, or condition in connection therewith not incorporated herein shall not be binding on the parties. No modifications to the terms of this Agreement shall be valid unless made in writing and signed by authorized representatives of the parties as herein described. It is further agreed that nothing contained in this agreement shall modify, amend, or supersede any prior or subsequent arrangement made between Research Members and Industrial Members with respect to activities outside the scope of this Agreement.

- (b) If any term of this Agreement is held invalid or unenforceable, such term shall be considered omitted herefrom and shall not affect the validity or enforceability of the rest of the Agreement. Failure of any party to force compliance or exercise power given by this Agreement does not invalidate the Agreement.
- (c) This Agreement shall bind and inure to the benefit of the parties hereto and their respective successors and permitted assigns. This Agreement may not be assigned by any party without written consent of the other parties.
- (d) No party to this Agreement shall be held in breach of Agreement for acts of God or other causes beyond the control of the parties including, but not limited to, fire, floods, labor disputes, civil disorder, or other unforeseen circumstances.

IN WITNESS WHEREOF, the parties hereto have caused this Agreement to be duly executed by their duly authorized officers as of the day and year set forth next to each signature.

Birla Institute of Technology and Science, Pilani

By_____

Typed Name: _____

Title:_____ Date Signed_____

Indian Institute of Technology, Delhi

By_____

Typed Name:_____

Title:_____ Date Signed_____

Indian Institute of Technology, Kanpur

By_____

Typed Name: _____

Title:_____ Date Signed_____

End of Draft Constitution and Procedures