

# Request for Proposals

## Creating Visions for Computing Research

### INTRODUCTION

The Computing Community Consortium (CCC) was created by the Computing Research Association (CRA) and is funded under a cooperative agreement from the National Science Foundation (NSF). The purpose of the CCC is to catalyze the computing research community to debate longer range, more audacious research challenges; to build consensus around research visions; to articulate those research visions; to evolve the most promising visions toward clearly defined initiatives; and to work with funding organizations to move the challenges and visions toward funding initiatives.

The reality of research funding is that budget increases are generally justified by new initiatives, and this is especially true for significant funding increases. New initiatives can be broad and encompass the entire field, such as the NSF Information Technology Research (ITR) program in the first half of this decade; they can focus on making significant progress on a specific research problem, such as cyber security or networking innovations; they can involve multiple disciplines, such as the new NSF program on Cyber-enabled Discovery and Innovation (CDI); or they can lead to thematic areas within existing programs, as has recently happened with several NSF programs. In all cases, groups outside of the funding agencies helped to formulate the visions that led to funded programs. For example, a small group of theoretical computer scientists created a white paper that described how computing theory could be viewed as a lens on the sciences, and that vision grew and broadened significantly to become the CDI program.

This Request for Proposals (RFP) solicits proposals for funded activities that will create visions for computing research that have the potential to excite the research community, help funding agencies increase their budgets, and encourage broader segments of society to participate in computing research and education. The visioning process can be viewed as a five-stage pipeline: (1) nucleation, (2) crystallization and broadening, (3) program formulation, (4), program realization, and (5) execution. The CCC aims to facilitate this process by supporting the nucleation, crystallization, and broadening of visions and by working with funding agencies to secure programmatic support for the most compelling visions.

The remainder of this RFP describes the visioning pipeline, gives proposal preparation instructions, and explains the review process and review criteria.

### THE VISIONING PIPELINE

The NSF in 2006 challenged the computing research community to think more broadly and to define compelling visions for computing research. The CRA took the lead in responding to NSF's request for proposals, and is now funded by the NSF to facilitate visioning activities *on behalf of* the computing research community. Ultimately, however, compelling visions start with a small number of individuals and become community-wide "grand challenges" only after an arduous, time-consuming process. In particular, the visioning process can be viewed as a five-stage pipeline.

The first stage of visioning is **nucleation**, namely the formulation of the germ of a vision by a small number of people. This stage pretty much just happens—at a workshop, via email, in the halls at a conference—when a small group realizes, for example, that there is a problem that needs fixing and they have an idea how to go about it (e.g., the Internet), or that there is a technology trend that presents challenges we do not know how to meet (e.g., multi-core to many-core). The role of the CCC is to encourage the nucleation of visions by providing exemplars of successful efforts and by providing seed funding that enables groups to get together, hold workshops, or otherwise develop a clear description of an interesting idea and a plan for how to develop it into a compelling vision. The output of the nucleation stage is a conceptual document that describes an exciting idea, demonstrates the existence of a core team committed to evolving the idea, and proposes the establishment of a study group and/or the convening of a focused set of workshops for the next stage.

The second stage is **crystallization and broadening**, which sharpens a vision and broadens it as a result of community participation. Crystallization could also involve expanding an idea to enlarge its scope of applicability (e.g., “Great research topics, but fit them into a broader context that will sell them.”) or to provide greater specificity (e.g., “Terrific elevator speech, but beef up the actionable research thrusts.”). This step can take a lot of time, and it involves lots more than a single workshop. The CCC will fund study groups that are sustained over a period of time, or multiple workshops that involve far more people than the original nucleation group. During this stage, funding agencies and technical interest groups of professional societies must be involved to ensure broad community engagement and to start to pave a path to a funded program. Community ownership is an important outcome of this stage. The output of the stage is a document that describes a clear and compelling vision, a set of research initiatives that would, if successful, realize that vision, and an indication of the scope of the effort required to realize the vision.

**Program formulation** is the third stage of the visioning process. During this stage the relevant research communities, with help from the CCC, work with funding agencies to formulate specific programs. This stage serves as a handoff from the research community to the funding agencies. The goal is to develop a game plan for a funded program; it is no longer just researchers formulating ideas. One test for readiness is that there are some ongoing projects that would fit into this program if it existed. There are lots of possible paths forward during this stage, ranging from a small funded program, to coalescing and expanding existing activities, to a new effort mostly drawing on existing funding, to a major effort backed by Congressional appropriations. The role of the CCC is to help funding agencies define programs and, when appropriate, also to work with industry and foundations. The output of this stage is a concrete proposal for one or more funded research programs.

The fourth stage of the visioning process is **program realization**, namely getting the program into agency budgets. The role of the CCC during this stage is to provide input to the budget-setting process. The final stage is **execution**, namely actual implementation of the funded research program.

## **PROPOSAL PREPARATION INSTRUCTIONS**

A **Visioning Proposal** may be submitted by any group of three or more individuals who are affiliated with organizations that are members of the CRA or that are eligible to be members.

A small group of people might have the germ of an idea and want to work with a larger community to try to nucleate a vision. A larger group might already have conceived of an exciting idea and desire to crystallize it into a compelling vision and possible research program by working with a broader segment of the research community—e.g., technical interest groups of professional societies—to broaden the scope of the vision and community interest in it. The outcome of a visioning project will be a conceptual description that is made available to the community for comment and possible further action.

Requested support can range from funding for one or two small workshops to funding for a lengthy study group. Budgets can range in size from \$10,000 to as much as \$200,000, depending in the size and scope of the effort that will be supported. Projects are expected to last from one to two years.

A proposal should describe the existing or potential vision; explain the proposed activities in detail, including how the larger community will be engaged; specify the goals of the project, including how they will be assessed; and specify the expected outcomes of the visioning activities, including documents and web sites that will be produced. The length of the project description should be commensurate with the scope of the proposed activities, but not longer than 12 pages. Each proposal should include a budget, budget justification, and biographical sketches of the personnel who are leading the visioning activity.

## **REVIEW PROCESS AND REVIEW CRITERIA**

Proposals may be submitted at any time. They will be reviewed on a quarterly basis by a subset of the CCC Council augmented by additional reviewers from the computing research community. Tentative review dates are October 2007, January 2008, April 2008, and July 2008. Proposals should be submitted no later than the first of October, January, April, or July to be reviewed during that month. The reviewing will be batched to facilitate comparative evaluation of all proposals received in each three-month window.

The CCC welcomes creative ideas from all segments of the computing research community. Our intent is to support all reasonable ideas that have potential. Each proposal will be reviewed on its own merits based on its potential to be a compelling vision and to engage a large segment of the research community. Larger proposals must be further along the visioning pipeline than smaller proposals, and they must have greater potential.

Proposals should be submitted by email to [CCCRFP@cra.org](mailto:CCCRFP@cra.org) as an attachment in PDF, Postscript, or Word. Questions about this RFP should also be sent to [CCCRFP@cra.org](mailto:CCCRFP@cra.org). A copy of this RFP and additional information as it becomes available (such as a FAQ) can be found at <http://www.cra.org/ccc/rfp>.

This RFP will remain in effect at least until the July 2008 review cycle. It will be reconsidered in spring 2008 and might be extended at that time.