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Organization: University of Central Florida

Proposal Detail:

Proposal Information

Proposal Number: 0803059
Proposal Title: CSUMS: Computational Mathematics with an Emphasis on Computer Vision and Imaging Science (CMECVIS)
Received by NSF: 10/17/07
Principal Investigator: Mubarak Shah
Co-PI (s): Niels da Vitoria Lobo
Xin Li
Constance Schober
Piotr Mikusinski
Performing Organization: U of Central Florida

This Proposal has been Electronically Signed by the Authorized Organizational Representative (AOR).

NSF Program Information

NSF Division: Division of Mathematical Sciences
NSF Program: Workforce in the Mathematical Sciences
Program Officer: Michael H. Steuerwalt
PO Telephone: (703) 292-4860
PO Email: msteuerw@nsf.gov

Proposal Status

Status As of Today Dated: **10/19/08**

Award **0803059** was made on **09/16/08** for **\$ 585,198.00** with an effective date of **09/15/08**.

Award Duration: **36** (months)

Warning: Our records indicate that the following Annual Project Report(s) are due or overdue for the Award(s) listed below. Please submit the report(s) as soon as possible using the Project Reports System within FastLane. The report(s) will be considered overdue if not submitted by the Report Period End Date. An overdue report will prevent the processing of this proposal:

Award **0737683**: Annual Report **due** for period ending **11/30/2008** for **Niels da Vitoria Lobo**

Comments from the cognizant Program Officer:

DMS-0803059

Mubarak Shah
Central Florida University

Dear Professor Shah,

I am pleased to tell you that your proposal to the CSUMS opportunity, Computational Science Training for Undergraduates in the Mathematical Sciences, is being recommended for an award. The context statement describes the general features of this competition. The proposal was reviewed by the CSUMS (Computational Science Training for Undergraduates in the Mathematical Sciences) panel.

Panelists say the investigators make a strong research team with considerable collective experience in mentoring undergraduates. They say that imaging is an important area, the projects are well described and appropriate for involving undergraduates, and the topics fit nicely with industrial and national interests. They feel the mathematical aspects are evident, like the links between computer science and mathematics, and note favorably various cohort-building activities and the institutional support. In discussion, they agree with the third reviewer, who finds some weaknesses in the recruiting plan. Even so, after consideration the panel put this in the highly competitive category, ranked 1 of 30 projects.

The CSUMS working group met to discuss the panel recommendations. We agree with the panel's view of strengths but have some other concerns, among them the relatively large number of mentors for a cohort of this size and the degree of commitment of mentors. This and some other points have been addressed satisfactorily in our email and discussions. I am pleased to recommend support.

Funding for this award is provided by the Division of Mathematical Sciences. We are greatly interested in the CSUMS activities you propose. We look forward to your annual reports. Please note that the solicitation imposes certain reporting requirements beyond the ones with which you are familiar for ordinary research awards. In addition, we strongly encourage you to keep us informed of any particularly interesting and significant results as they arise while you carry out the project.

Congratulations on your award and best wishes for the continued success of your research and education program.

Sincerely,

Michael Steuerwalt
Program Director,
Applied Mathematics
703-292-4860 msteuerw@nsf.gov

for the CSUMS working group

Reviews

All of the reviews of your proposal that have been released to you by your NSF program officer can be viewed below. Please note that the Sponsored Project Office (or equivalent) at your organization is NOT given the capability to view your reviews.

Document:	Release Date:
Panel Summary #1	Aug 8 2008 5:22PM
Review #1	Aug 8 2008 5:23PM
Review #2	Aug 8 2008 5:23PM
Review #3	Aug 8 2008 5:23PM

Context Statement

National Science Foundation

Directorate for Mathematical and Physical Sciences
Directorate for Education and Human Resources

Context Statement

Computational Science Training for Undergraduates in the Mathematical Sciences (CSUMS)

Proposals submitted to the CSUMS Program are evaluated by panel review using the two NSF review criteria of intellectual merit and broader impacts as described in the NSF Grant Proposal Guide (NSF 04-23). Additional criteria are applied as specified in the program announcement NSF 06-559.

An advisory panel of experts reviewed 30 distinct projects (including several collaborative proposals) submitted for the October 2007 deadline. The panel placed 5 projects in the Highly Competitive category, 9 in the Competitive category, and 16 in the Not Competitive category. At least three panelists were assigned as reviewers to each proposal. Verbatim copies of all reviews used in the decision are provided. When reading reviews, please keep in mind that reviewers address their comments chiefly to the NSF, not necessarily to the investigators. Some reviews may contain irrelevant, insubstantive, or erroneous statements that were not used in determining the recommendation.

While reviewers' ratings are considered, the content of their reviews is more important in assessing the merits of each proposal. Different reviewers may offer insights into different aspects of a proposal. Reviewers' comments are considered in the context of other reviews they have provided. Thus average rating is not the determining factor in a recommendation; rather, a clear picture of each proposal's strengths and likely impact is sought.

External reviews and panel evaluations are advisory. Decisions to fund or decline are made by NSF. While many projects warrant funding, because of budget limitations many meritorious projects are declined. In the difficult decision-making process, Program Directors consider the relative strength of each proposal as well as other factors, such as award balance among sub-disciplines, geographic distribution, types of institutions, and the potential contribution of each award to broadening the participation of individuals from groups traditionally underrepresented in science. After considering these factors and based on available resources, the CSUMS Program expects to fund approximately 4 or 5 of the submitted proposals.

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Proposal Status | MAIN ▶

Organization: University of Central Florida

Panel Summary #1

Proposal Number: 0803059

Panel Summary:
Panel Summary

What is the intellectual merit of the proposed activity?

This is a strong proposal from a strong research team with extensive experience in mentoring undergraduate researchers. It will develop interdisciplinary teams of faculty, students and industry partners focused on mathematical and computational problems in imaging science. This is an increasingly important research area. The panel agreed that this area of research is a very promising one for undergraduate research. The potential projects are explained in clear detail. They appear to be both on the research frontier and accessible to undergraduates; the topics fit well with the interests of local high-tech industry and are of importance for national interests.

The proposal builds, in a synergistic manner, on strengths of two departments: Computer Science and Electrical Engineering, but the core remains in the Mathematical Sciences. The panel appreciated the strong institutional support on the part of UCF in terms of financial support of participants and graduate students. The distinguished speaker series, social events, and field trips are valuable additions.

What are the broader impacts of the proposed activity?

The proposal will provide computational science training in significant applied areas. It has the promise of being a model of how to do CSUMS at institutions having a comparable size.

The panel noted a weakness in the recruiting strategy.

Panel Recommendation: The proposal is ranked Highly Competitive

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Proposal Status | MAIN ▶

Organization: University of Central Florida

Review #1

Proposal Number:	0803059
Performing Organization:	U of Central Florida
NSF Program:	Workforce in the Mathematical Sciences
Principal Investigator:	Shah, Mubarak
Proposal Title:	CSUMS: Computational Mathematics with an Emphasis on Computer Vision and Imaging Science (CMECVIS)
Rating:	Excellent

REVIEW:

What is the intellectual merit of the proposed activity?

The Central Florida proposal plans projects in computer vision and imaging science. The PI Shah has extensive experience in mentoring undergraduate researchers.

Each cohort consists of 10 students who participate in a year-long program. Participants begin in spring semester with relevant coursework. They participate in a three-week summer session on image processing and choose a project later in the summer. The project is completed during the following fall semester. The next spring semester's student stipend may also be supported from other sources. In addition, graduate students are used to support the research projects, also supported from UCF funds.

The potential projects are explained in clear detail. They appear to be both on the research frontier and accessible to undergraduates. All aspects of the program plan are described in detail. The institutional experience with the REU programs lead to a high degree of confidence that the plans will be carried out in a high quality manner.

What are the broader impacts of the proposed activity?

The broad impact of the proposal results from its role in training undergraduates in computational mathematics.

Summary Statement

This is an excellent proposal in all respects. The projects are of high quality and the organization is sound. The proposal lies in the top third of the group.

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Proposal Status | MAIN ▶

Organization: University of Central Florida

Review #2

Proposal Number:	0803059
Performing Organization:	U of Central Florida
NSF Program:	Workforce in the Mathematical Sciences
Principal Investigator:	Shah, Mubarak
Proposal Title:	CSUMS: Computational Mathematics with an Emphasis on Computer Vision and Imaging Science (CMECVIS)
Rating:	Excellent

REVIEW:

What is the intellectual merit of the proposed activity?

What are the broader impacts of the proposed activity?

Summary Statement

This proposal describes an interesting program in computer vision and imaging science that is aimed at undergraduate mathematics majors. Since all of the better CSUMS proposals have the same ingredients as this one - a large group of faculty mentors, a well-designed set of preparatory courses for participants and majors at large, and a summer research opportunity - it's nice to see a proposal with a distinctive scientific focus and clear implications for national security.

There are 5 PIs and another 5 senior personnel. This seems adequate to supervise 10 students per year without faculty "burnout". The preparatory courses - Numerical Methods and Modeling I - are well-designed and a welcome update to the usual undergraduate mathematics curriculum. The followup courses in Computer Vision and Modeling II will provide students with excellent preparation either for graduate study in related fields or for professional employment after completing their baccalaureate degrees. The topics fit well with the interests of local high-tech industry. This is important, since I expect that the majority of UCF undergraduates are from Florida and most will want to remain in the area after graduation.

The distinguished speaker series, social events, and field trips are valuable additions. I especially like the idea of having one mentor from mathematics and another from computer science assigned to each student.

The main weakness in the proposal is the recruitment plan. In my experience, the great majority of applied mathematics majors don't start out that way; usually they major in something else first (mostly engineering or computer science, but also economics and life sciences). Thus, advising plays a critical role to ensure that prospective participants complete all the necessary prerequisites in

a timely manner.

All in all, I think that this is an excellent proposal. I would like to see some plan (e.g., summer internships with local industry) that could help sustain the effort after CSUMS funding ends.

My rating: Top third of the proposals that I have reviewed.

My recommendation: Highest priority for funding.

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Organization: University of Central Florida

Review #3

Proposal Number:	0803059
Performing Organization:	U of Central Florida
NSF Program:	Workforce in the Mathematical Sciences
Principal Investigator:	Shah, Mubarak
Proposal Title:	CSUMS: Computational Mathematics with an Emphasis on Computer Vision and Imaging Science (CMECVIS)
Rating:	Excellent

REVIEW:

What is the intellectual merit of the proposed activity?

This proposal will develop interdisciplinary teams of faculty, students and industry partners focused on mathematical and computational problems in imaging sciences. This is an increasingly important research area where much still needs to be done.

What are the broader impacts of the proposed activity?

This proposal has the potential of being a national model of how to do CSUMS in a portable manner that would work at institutions having a comparable size. It has the potential of engaging well trained mathematics students in significant applied areas.

There is a strong and important applied research component that lends itself to deep computational and mathematical analysis and the synergistic interactions provided through nontrivial interactions is very valuable.

This proposal will train 10 students per year in areas of increasing national importance.

Summary Statement

This is an excellent proposal: Well thought out, clear program design, well integrated with several campus programs and industry partners. The proposal builds, in a synergistic manner, on strengths of two departments: Computer Science and Electrical Engineering, but the core remains in the Mathematical Sciences.

This reviewer found the induction of the 10 students per year, half from underrepresented groups, to be reasonable and doable, given PI back ground and University infrastructure. The student training elements, for example, working with advanced graduate students may initially be overwhelming for Junior students, but the 12 month period of intensive engagement is likely to be very rewarding.

The PI team is strong and active and the Dean is supportive.

This is a compelling proposal and has the promise of being a national model of how to do CSUMS right.

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