UTHSCSA Innovative Teaching Grants Program

ITG Application

Title of ITG proposal: Innovative Database Design for Management of Medical Case Mat

Names and titles of project director and principle collaborators:

Project Director:

Name: Michael Freckleton, MD

Title: Associate Professor, Attending Physician

Department & Division: Diagnostic Radiology-- Abdominal Imaging

E-Mail: freckleton@uthscsa.edu

Campus phone number: 567-1064

Collaborators

Name: Neal Dalrymple, MD

Title: Associate Professor, Attending Physician

Department & Division: Diagnositc Radiology-- Abdominal Imaging

E-Mail: Dalrymple@UTHSCSA.edu

Campus phone number: 567-6470

Name: Sammir Chhaya, MD

Title: Assistant Professor, Attending Physician

Department & Division: Diagnostic Radiology-- Muskuloskeletal Imaging

E-Mail: Chhaya@UTHSCSA.edu

Campus phone number: 567-6470

Name: Steve Liu, PhD

Title: Associate Professor of Computer Sciences

Department & Division: Texas A&M University, department of Computer

E-Mail: liu@cs.tamu.edu

Campus phone number: 979-845-8739

ITG Proposal Synopsis

Project Title: Innovative Database Design for Management of Medical Case Material and In

What is the educational problem or need that is addressed by this project? {50 words}

At the graduate level, and to a lesser degree, the medical student, medical education centers mostly on patient case material. These actual patient encounters provide invaluable education opportunities for students at all levels, and for many years to come. This case material, however, largely goes to waste as there's no comprehensive means of storing, retreiving, or doing complex searches or manipulation of the data.

What do you propose to do? (briefly describe what you will develop – E.g., what is the product or outcome that will be produced?) {50 words}

This project has 2 components:
1- Develop a robust, relational database archetecture to allow health care providers to input, archive, and query HIPPA compliant patient data.
2- Develop the necessary tools to store, retreive and manipulate image object data from the archive.

We know of no such database or set of compatible image manipulation tools for medical patient data.

What type(s) and numbers of students will directly benefit from this project?

All students in the Health Sciences will be able to benefit from this project, including medical and dental schools, nursing and allied health. In addition, as these students go on to post-graduate training and or clinical practice, an archive of patient case data will continue to assist them in understanding and treating disease.

How will you evaluate the effectiveness of this project? {50 words}

According to the criteria listed below, some of our criteria will be quantitative (counters to determine number of "hits" to the site; number of departmental and institutional partners) and some will be qualitative (degree of acceptance and general satisfaction by students, residents and faculty)

Total amount of funding requested: $_____10,000.00

Project Approval by Department Chair:

Name: Gerald Dodd

Department: Diagnostic Radiology

Signature: _____ **Date:** _____

UTHSCSA Innovative Teaching Grants

ITG Proposal

Your application is expected to answer each of the six questions below. Please read the review criteria on page 6.

1. **Why should this project be implemented?** Discuss the problem, need or deficiency that will be addressed by this project and discuss why it is important to resolve this problem.

2. **What will be developed or implemented?** Describe the product or outcome.

3. **What objective(s) do you hope to achieve by implementing this project?**

4. **What tasks will be performed to complete the project and who will perform each of these tasks?** Describe the plan / methods for completing the work.

5. **How will you evaluate the effectiveness of this project?** Describe how you will evaluate whether or not the project objectives were achieved.

6. **What is your plan for continuation of the project after ITG funding support concludes?**

Other:

[ ] Complete the project budget.

[ ] Develop a logic model for your proposal (example of logic model provided.

[ ] Attach a 2 page biographical sketch of the Project Director.

[ ] Schedule a pre-submission consultation meeting with the ITG Coordinator.

UTHSCSA Innovative Teaching Grants
Budget Request

Project Director: Michael Freckleton, MD

Title of Proposal: Innovative Database Design for Management of Medical Case Material a

		Funds Requested
1. Consumable Supplies (Itemize below)	$	
2. Equipment (Itemize below)	$	1,000.00
3. Hourly Rate Services (such as software programming) Must be calculated at an hourly rate.	$	0.00
Example: 30 hrs programming @ $30/hr = $900		
4. Other expenses (Itemize precisely)	$	9,000.00
TOTAL	**$**	10,000.00

Itemize Expense Items

Consumable Supplies	Equipment	Hourly Rate Services	Other Expenses
	-Laptop computer for programming support.	Note: We propose conducting computer programming at the level of graduate computer science students. Therefore, this won't be listed as an hourly rate, rather, as a project rate. This rate will be listed below:	This money would be used to hire a graduate student in computer sciences. The student rate plus fringe is around $2,250/month (thus this figure isn't entered under the "hourly rate services" section of this application. Gruaduate students don't have an hourly rate, so we've estimated 4 months X the salaried rate.

Travel and equipment: Budget requests to support travel for presentations at meetings related to an ITG project must be justified in the application. If the grant is funded, travel expenses may not exceed 10% of the total award. If the project budget includes funds for purchasing equipment, the applicant must document that such equipment is not available or accessible at The UTHSCSA.

Define the target population: Who will your program serve? *Be specific*: If age range, SES, geographic location are important, then specify them.	What are the theoretical assumptions you are making about how your program will work? What assumptions are you making regarding: 1) participants? 2) environment? 3) staff?	Resources: What resources does the program have available to achieve the program objectives/ goals? Constraints: What obstacles or challenges might there be? Example: Legal or regulatory constraints	These are the services/interventions that a program provides to fulfill its goals. Activities lead to outputs and are directly related to outcomes.	Outputs are the products of a program's activities such as the number of classes held, the number of home visits made, the number of people attending/completing classes, etc.	Outcomes are the benefits for participants during, or after their participation in your program. Outcomes may be related to, knowledge, skills, attitudes, values, behavior or status. There are usually *short-term*, *intermediate*, and *long-term* outcomes.	Outcome indicators Are the observable, measurable characteristics or changes that result represent the achievement of an outcome.

Program Logic Model

Innovative Database Design for Management of Medical Case Material and Interactive Manipulation of Image Data

Program Goal:

TARGET POPULATION	ASSUMPTIONS	INPUTS	ACTIVITIES	OUTPUTS	OUTCOMES	OUTCOME INDICATORS
The target population is a broad group of health care students and health care providers to include medical, dental, and allied health students, residents, and attending physicians.	We assume that if a comprehensive and easily searchable repository of patient case information and images exist, people will use this. We feel secure in this because people use such case material routinely even though it's very difficult to archive, reproduce, and find. What makes this project innovative is the assumption that we can create such a program that will allow interaction with large image files such as radiology data, digital photographs, etc.	Our largest constraint is that the programming tools which allow integration of medical images into a database format and then manipulated doesn't exist. For exmaple, we need to develop the mechanism for storing an AVI file in a Database Table, then extract the file, insert it into a web-based GUI, then control the rate and direction of viewing this AVI file. Again, this is the innovative part of this project.	Two components exist to make this program effective: 1- Acquiring medical case data. This is performed routinely within all departments of this teaching facility, and will continue to happen even if we don't provide the proposed resource. This program will simply facilitate the collection and entry of data for the health care worker. 2- Creation of the database engine and image manipulation tools is the largest of the "new" activities involved in this project, and thus represent the preponderance of funds we're requesting for it.	The output of the program, like it's activities, are 2-fold: 1- A large archive of important and valuable medical case material. 2- An exportable program that will facilitate gathering, archiving, viewing, manipulating, and presenting this case material.	Outcomes of this project will come in the form of enhanced education. For example, we know that in Radiology, the greater the number of cases a resident sees during his/her training, the better he/she is trained. This program will allow cases to be presented electronically, which will save a great amount of time. It will also allow the student to sub-select what types of cases are seen, for more specific focus on a given topic. It will also greatly reduce the amount of time it takes to put together a conference or lecture as the case material is available to all presenters, and will make case material available to all students/faculty, not just those who happen to be working around a given patient on a particular day.	The follow metrics could be tracked: 1- Resident/Medical student satisfaction with the program 2- Number of cases/month entered into the case file 3- Number of cases/hour that an individual is able to view 4- Amount of time to enter a case before vs. after development of the project 5- Satisfaction of presenters who are preparing lectures 6- Willingess of other institutions to share and contribute with development of the archive as measured by the number of institutions which join, and the number of cases they enter.

Review Criteria for ITG Proposals

ITG proposals will be evaluated in relation to the applicants' responses to the areas below. A pre-submission meeting with the ITG Coordinator is required.

1. **Description and justification of the problem, need or deficiency**
   Why should this project be implemented? What is the problem, need or deficiency that will be addressed by this project? And why is it important to address this problem.

2. **Uniqueness of the project**
   What will be developed or implemented and, importantly, why is this approach innovative and likely to enhance students' learning or the quality of their educational experience?

3. **Potential for impact**
   What objective(s) do you hope to achieve by implementing this project?

4. **Thoroughness of the work plan.**
   What tasks will be performed, how it will be done, and who will do the work?

5. **Appropriateness of the evaluation plan**
   Describe how you will evaluate whether or not the project objectives were achieved.

6. **Plan for continuation**
   What is the plan for continuation of the project after ITG funding concludes?

7. **Development of a Logic Model**
   The logic model is a tool that will provide assistance in the planning and implementation phase of the project.

8. **Pre-submission meeting with the ITG Coordinator**
   The ITG Coordinator will certify that the meeting occurred.

ITG Application Template

Please complete each section of the application. Please type.

1. Why should this project be implemented? Discuss the problem, need or deficiency that will be addressed by this project and discuss why it is important to resolve this problem.

This project would be a big win for everyone. A recent review of electronic case material shows that medical teaching files continue to persist, even at large institutions such as Harvard University, as flat indexes of data and images. These aren't searchable, and they're scattered within disparate departments and institutions. The "case" is the nucleus of medical education-- it only makes sense that this valuable resource be collected, archived, and made readily accessible to those who are or will be providing medical care.

2. What outcome(s) do you hope to achieve by implementing this project?

1- A large, searchable, and interactive archive of medical case material with supporting imaging and graphics.
2- A computer-based program which can be easily implemented at UTHSCSA in the near term, and will then be easily exportable to share with other teaching centers.
3- Improved education and teaching environment created through implementation of this program and its archive.

3. What will be developed or implemented? Describe the products or outcomes. Examples: web-based curriculum, CD-ROM, teacher training programs.

We will develop a web-based Database program AND the image manipulation tools that will allow valuable patient case material to be entered, archived, queried and utilized in a broad range of educational activities from self-teaching sessions at the computer to presentations, lectures and seminars.

4. Methods: What tasks will be performed to complete the project and who will perform these tasks? Describe the plan / methods for completing the work.

The basic outline for the task has already been developed by the Lead Investigator, and prototypes of the program were presented at national meetings and utilized over the Internet from as early as 1996. The new task is to develop a relational database prototype (the former database being flat field)and the new image manipulation tools for the images. The software development will largely occur at Texas A&M University, by one or more graduate students under the immediate supervision of Dr. Steve Liu. Only the time of the graduate student(s) will be billed against the project. In other words, the project is leveraged by the time of Faculty Physicians, Residents, Medical Students, and a senior computer software developer who won't be billing for their time.

5. How will you evaluate the effectiveness of this project? Describe how you will evaluate whether or not the project objectives were achieved.

1- How well it's accepted
2- How many cases are archived
3- How often it's accessed
4- How many departments within UTHSCSA and how many institutions outside actually participate.

6. What is your plan for continuation of the project after ITG funding support concludes?

- We will seek additional funding to continue to expand the project. Such a project would have great interest to publishers, educational institutions, medical societies, medical libraries, etc., and we envision a great deal of financial support for the follow-on.

Project Director biosketch:

- 2004 to Present Associate Professor, Radiology, University of Texas Health Science Center, San Antonio, TX
- 2003 to 2004 Assistant Professor, Radiology, The University of Texas Health Science Center at San Antonio, San Antonio, TX
- 2002 to 2003 Medical Director, MDiagnostics Inc., Texas Operations, San Antonio, TX
- 2001 to 2002 Director, Office for Applied Solutions in Operational Medicine, Brooks City Base and Texas A&M University, San Antonio, TX
- 1998 to 2002 Special Consultant to US Surgeon General of Air Force, IPA Agreement with Texas A&M University, San Antonio, TX
- 1995 to 2003 Clinical Assistant Professor, Radiology, The University of Texas Health Science Center at San Antonio, San Antonio, TX
- 1994 to 1998 Teaching Faculty, Wilford Hall Medical Center, San Antonio, TX

1994 to 1998 Staff Radiologist, Clinical, Wilford Hall Medical Center, Lackland AFB, TX

- 1990-1994 Resident in Diagnostic Radiology, University of Minnesota Health Science Center, Minneapolis, MN
- 1989-1990 Intern, St. Joseph's Hospital, Chicago, Ill.

1985-1989 Medical Student, Northwestern University Medical School, Chicago, Ill

- 1989 Graduation, University of Utah: BS Animal Biology, BA Spanish Languages