

Funding

Yifan Tang and Fang (Daisy) Tang
Distributed Intelligence Laboratory
Department of Computer Science
University of Tennessee, Knoxville

Sept. 20, 2005

Source

- The Office of Research at UTK
 - https://san4.dii.utk.edu/pls/portal30/url/page/or_researchers
- J. Levine: Guide for writing a funding proposal
 - <http://www.learnerassociates.net/proposal/>
- S. Finger: Advice on writing proposals to the National Science Foundation
 - <http://www.cs.cmu.edu/~sfinger/advice/advice.html>
- Other websites
 - <http://www.nsf.gov/>
 - <http://www.asc.nasa.gov/>
 - <http://www.darpa.mil/>
 - <http://www.volpe.dot.gov/infosrc/strtplns/nstc/effproc/appe.ppt>

Agenda

- Why funding
- Funding sources
- Funding types
- Funding announcements
- DARPA funding
- University formalities
- A to-do list
- How to write funding proposals (Daisy)
- Discussion

Why Funding?

- Motivation and innovation
- \$\$\$\$\$\$\$
 - More manpower
 - More facilities
- Reputation and publications
- Tenure

Funding Sources

- Funding organizations
 - DARPA: The Defense Advanced Research Project Agency
 - The central research and development organization for the Department of Defense (DoD)
 - NSF: National Science Foundation
 - Funds yearly approximately 11,000 projects out of 40,000 proposals
 - Less than 10% approval for Computer Science proposals
 - “Carrier”: 5 years grant for new Ph.D. faculty member
 - The Office of Naval Research
 - The Army Research Office

Funding Sources (con't.)

- Your own university

- Start up funding for faculties
- Support of faculty research and creative activities

- The Office of Research at UT:

(Source: https://san4.dii.utk.edu/pls/portal30/url/page/or_researchers)

- SARIF (Scholarly and Research Incentive Funds): \$1,100,000 per year
- Chancellor's Awards: \$3,000 - \$6,000

Funding Sources (con't.)

- Other internet services
 - Research grant, e.g.
 - Community of Science: <http://www.cos.com/>
 - ResearchResearch:
<http://www.researchresearch.com/entry/entry.htm>
 - SBIR/STTR: Small Business Innovation Research Program/Small Business Technology Transfer
 - For new Ph.D. faculty, e.g. “Young Investigator Awards”
 - Mailing list
 - Grant alert services

Different Types of Funding

(source: <http://www.nsf.gov/funding/aboutfunding.jsp>)

- Most NSF funding opportunities are divided into program areas:
 - Biology, Computer and Information Sciences, Education, Engineering, Geosciences, Math, Physical Sciences, Polar research, Science Statistics, Social, Behavioral Sciences
 - Crosscutting programs
 - Interdisciplinary research
 - International

Different Types of Funding (con't.)

- Additional funding opportunities are:
 - To provide funding for students and to identify programs that focus on educational developments for this group:
 - For undergraduate students
 - For graduate students
 - Example:
<http://www.nsf.gov/pubs/2005/nsf05601/nsf05601.htm>
 - For postdoctoral fellows
 - For K-12 educators
 - To support small businesses

Common Solicitation Types

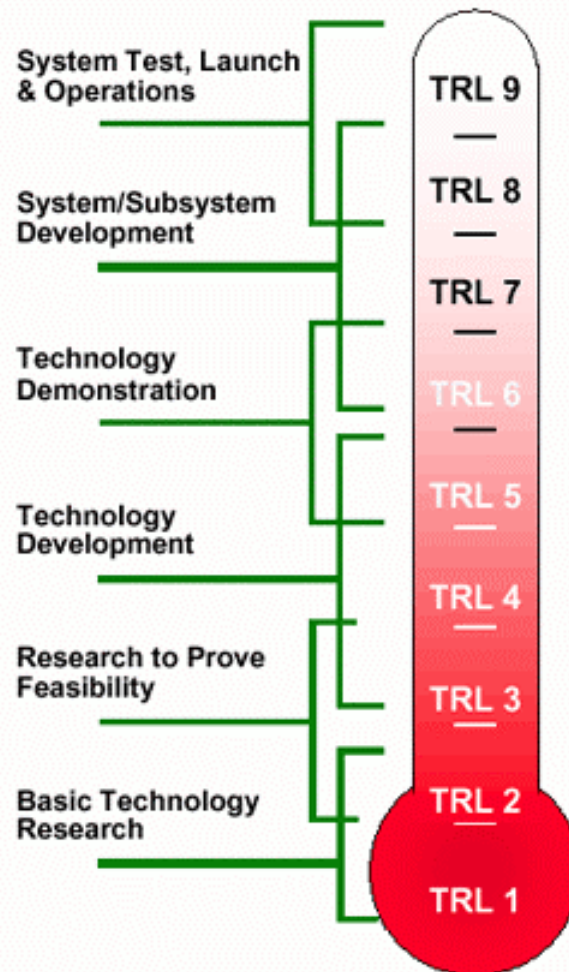
- RFP: Request for (Competitive) Proposal
 - An organization issuing a new funding sends out RFP to agencies that it believes may be qualified to participate, or make a general announcement.
 - It is intended for competitive proposals
 - For more applied works and more specific deliverable
- BAA: Broad Agency Announcement
 - The applicants of the funding initializes the proposal
 - For more basic research

Technology Readiness Levels

(source: <http://www.asc.nasa.gov/aboutus/trl-introduction.html>)

- Def.: TRL are a systematic metric system that supports the *assessment of the maturity* of a particular technology and the consistent *comparison* of different types of technology
- The TRL system was adopted by the NASA space program for project tracking and management
- TRL1, TRL2, TRL3, etc. are practically equivalent to the government 6.1 (spoken as “six-one-funding”), 6.2, 6.3, etc. funding.

TRL Categories



TRL Categories (con't)

- Basic research in new technologies and concepts: TRL 1 and TRL 2
- Focused technology development addressing specific technologies for one or more potential identified application: TRL 2 and TRL 3
- Technology development and demonstration for each specific application before the beginning of full system deployment: TRL 3 – 6
- System/subsystem development: TRL 6, 7, and 8
- System launch and operations: TRL 8 and TRL 9

DARPA Solicitation Mechanisms

(source: <http://www.darpa.mil/ipto/solicitations/faqs/generalPrint.htm>)

- Different types of announcement:
 - RFP
 - BAA
 - Other Research Announcement

DARPA Funding Mechanisms

(source: <http://www.volpe.dot.gov/infosrc/strtplns/nstc/effproc/appe.ppt>)

| | Solicitation | Type of funding | Recipient |
|-----------------------------|---------------------------------|--------------------------------|--|
| Procurement contract | RFP/BAA | CPFF | Any organization |
| Grant | BAA | Typically fixed sum | Typically university/non-profit |
| Other transaction | BAA/Other Research Announcement | Milestone payments | Typically consortium or commercial firm |
| Sec 845 prototype agreement | Program solicitation | CPFF, CPIF, milestone payments | Typically consortium or defense contractor |

DARPA BAA

- BAA: A general announcement of an agency's research interest
- Including criteria for selecting proposals
- Can be used for basic, applied, and advanced research
- Not for developing a particular system and hardware (→ RFP)

DARPA BAA (con't.)

- The forms of funding: contract, grant, cooperative agreement, and other transactions
- The amount of funding is either specified in the “program scope” section, or not provided. Either way the proposal must include cost summaries
- The funding period is normally not specified
- A single Program Manager from DARPA oversees each project, and represents the project internally and externally. But the PM no longer completely controls the funding
- An example:
 - http://www.darpa.mil/ipto/solicitations/open/05-43_PIP.htm

The Funding Decision Maker

- DARPA: Program Manager (normally on a contract of 3 years at DARPA)
- NSF: Program Director
 - They are specialist in the research area.
 - A lot of them are professors on leaves of absence.

DARPA vs. NSF

| | DARPA | NSF |
|------------------------|---|-------------------------------------|
| Objectives | Specific idea, high risk | Wide open research |
| Political relevance | PR factor, jazzy objectives | Geographical criteria |
| Other specifics | Quarter yearly Milestone oriented | Heavy duty on "related works" |

Budget

- It is a guessing game
- You probably will not receive all the money
- Capital investment is mostly not included
 - You need to have the facilities for your research

Find the Right Funding for You

- One way to find out is to ask the program manager for the specific focus of this project and to adapt your own research interest to this project.
- Networking skills are essential for large projects.
- Time is an issue.

University Formalities

- The proposal approval process must be considered in your time table. For example, a proposal could need approvals from:
 - The Dean of the College
 - The Dean of the Graduate School
 - The VP of Academic Affairs
 - The Contracts Department / The Office of Research
 - The President of the University
- The university checks the budget estimation, and for NSF proposals, also the format of your proposal

University Formalities (con't)

- Limited submissions and mini proposals:
 - The sponsor restricts the number of applications or proposals a campus can submit to an agency.
 - At UT:
 - The faculty needs to submit mini proposal to the Office of Research.
 - A committee will be formed for internal reviews.
 - The Office of Research makes the final decision, considering the committee's input.

A To-Do List

- Identify your research area and the key terms.
- Collect information about the funding sources.
- Clarify the institutional formalities that apply to you.
- Improve your networking
 - Co-proposers
 - Program managers and program directors

How to Write Funding Proposals

- General Advice
- White Paper vs. Research Proposal
- Key Sections
- A Case of Study of NSF Proposal
- NSF Proposal Review Process
- Discussion

General Advice

- Always read the RFP to find out what the funders want. Find out about the agency, its goals, and its review system.
- All proposals should answer the following questions in one form or another:
 - What is the problem being addressed? (What is the goal of the research being proposed? What is the hypothesis being tested?)
 - Why is the problem important and interesting?
 - What will you DO to address the problem? If you complete the plan, will that bring us closer to an answer to the problem?
 - Do you have the resources (equipment, grad students, access to industry ...) necessary to complete the research?

Other Advice

- Read the program announcements before you talk to the program director
- Call or send email to the program director for your area to discuss the idea in your proposal
 - Find out which program supports your research area
 - Ask if there are other people you should talk to and what special initiatives might apply to you
 - Listen to what they say and be polite

White Paper vs. Research Proposal

- A white paper represents the initial step in a process that could result in the awarding of a research contract. Selected white papers will be followed by requests for proposals. The response to the call should briefly address context, rationale, novelty, approach, anticipated results, engagement with industry, student participation, and funding requirements.
- Research proposals provide sufficient information to permit an evaluation of the intended research – its technical merits, innovative approach, and relevance to the agenda.

Key Sections

- Project Title/Cover Page
- Project Overview
- Background Information/Problem Statement
- Project Detail
 - Goals and Objective
 - Methods
 - Staff/Administration
- Evaluation Plan
- Bibliography
- Appendices

Project Title/Cover Page

- Check if a special format is required
- Signatures of key people (PI, ...)
- Possible collaborators
- Title = mini-abstract, a quick picture for the reader of the key ideas of the project
- Title reflects the focus of the proposal (different orders represent different focus)
- Remove unnecessary words

Project Overview/Abstract

- Give the big picture & summarize the whole paper, should include:
 - The problem you are addressing (what do you intend to do and why is it important?)
 - The approach (how are you going to do it?)
 - The experimental plan (how to evaluate it?)
- Be specific and concise, leave no confusion
- Mention your collaborators
- The best time to write it: after you've completed the whole proposal

Background/Related Work

- Related work: cite previous projects
- Position your project among other projects and show how your project:
 - Will extend the work that has been done
 - Will avoid the mistakes/errors that have been made
 - Will serve to develop stronger collaboration between existing initiatives
 - Is unique since it does not follow the same path as previously followed
- Minimize confusion: jargon, abbreviations, redundant phrases, confusing language

Problem Statement

- You should answer:
 - What are the problems you want to address?
 - How do you know these problems are important?
- Indicate how the problems that will be addressed in your project will help the funding agency in fulfilling their own goals
- Is there a special reason why your organization are uniquely suited to conduct the project?
- Prove to the reader that an ongoing approach to the problem is essential (it seeks to provide a long term response)

Project Details – Goals & Objectives

- Goals are the large statements of what you hope to accomplish but usually are not measurable
- Objectives are operational, tell specific things you will be accomplishing in your project
- Objective forms the basis for the activities of your project and serve the basis for the evaluation of your project
- Try to insure that your goal/objective matches the funding organization's goal/objective

Project Details -- Methods

- Explicitly link your methods with your objectives
- Clearly present the innovative aspects of your idea
- Include the collaborative relationships your project will be developing with other groups
- Clearly indicate how the methods allows the outcomes of your project to have value for others beyond your project
- Preliminary work that provide a promising basis for your project

Project Details – Staff and Administration

- Describe the roles of different participants
- Clarify how each role is essential to the success of the project and how each role relates to the operationalizing the methods you described
- Let funding agency know that you have excellent people who are committed to the project
- Try making your project a team effort

Evaluation Plan

- It is important to describe how you decide the success of your project
- Include both a formative evaluation/process evaluation (feedback during process) and summative evaluation/product evaluation (show the project fulfilled what was originally proposed)
- A good evaluation plan should include what goes on following the conclusion of the funding period

Appendices

- Time line – a clear indication of the time frame for the project and the times when each aspect of the project will be implemented
- Letters of support
- More detailed description of each cooperating agency

A Case Study: NSF Proposal

- Project Summary
- Results from Prior NSF Support with past 5 years
- Project Description (15 page limit)
 - Objectives and Expected Significance
 - Background and Technical Need
 - Research Description
 - Education and Human Resources
 - Plan of work
 - Bibliography
- Biographical Sketches
- Budget
- Current and Pending Support

Review Process – Single Blind Peer Review

- Mail review: six reviewers with a mix of academics, industry, and gov. reviewers
- Panel review: form a panel of 10 to 15 experts to review a set of proposals

Discussion

- How to find the people to collaborate?
- How do you conduct a professional proposal in a short amount of time?
- How to estimate the costs, especially when the amount of funding is not specified?
- How to balance your own research and the funded research?
- Would it decrease your credibility if you send out too many proposals?

Thank you!

Questions

