Grant Writing Skills
(and why you want them)
Today we will discuss ...

- Grant writing in your career
- Reality of funding
- Pre-proposal planning
- Finding the right opportunity
- Writing grant proposals
- Submitting grant proposals
- Getting better
First, expectations of an academic career
Assume that you pursue an academic career

Teaching
Research
Service
HOW PROFESSORS SPEND THEIR TIME

How they actually spend their time:

- Teaching: 59%
- Research: 18%
- Service: 23%

How departments expect them to spend their time:

- Teaching: 20%
- Research: 175%
- "Service": 20%

How Professors would like to spend their time:

Don’t tell me what to do

Source: Higher Education Research Institute Survey (1999)
Your First Proposal

Easy, right?
10-20% get funded. How can you be one of them?
Activity: Fund an abstract

#1
This project extends the cognitive modeling (CogM) architecture to characterize and improve user security decision-making and behaviors. Focusing on cognitive constructs in the ACT-R and Soar architectures, it models the multi-tasking application and security activities with varying cognitive traits and security constraints, through representations of productions and information chunks, as well as their utility and activation calculations. An analytic user model not only describes a problem in making a security decision, but also can explain why and how it happens for incentive and intervention selection. Moreover, CogM models and empirical user testing comparatively study common and advanced users in typical messaging applications, regarding security mistakes and efficiency in task completion. This project is focused on establishing the principles for analytically modeling user cyber behaviors and bridging the gap from understanding security behaviors to effectively improving security performance.

#2
This work takes a first step toward rigorously understanding how humans think about code to (eventually) help to dramatically reduce bugs by building more human understandable programming languages and programs. This project will perform a pilot study to determine how to understand such security bugs, tease out the key aspects of them, and integrate this understanding into expert tutoring systems to help programmers detect them. Cognitive science techniques will be used to derive the core contributing issues in existing security vulnerabilities by slicing vulnerabilities into their component parts and evaluating the resulting bugs. This will create a generalized understanding of security issues which will enable easy reproduction and replication of similar source code, which is ideal input for an expert tutoring tool. The resulting expert tutoring tool will be used to evaluate the effectiveness of tutoring in helping programmers reduce their susceptibility to similar bugs.

#3
This work conducts a series of empirical studies to find out the social and cognitive heuristics online viewers use in image credibility evaluation and how such evaluations influence their attitudes and behaviors. The data from these studies will help predict the ways by which viewers are most likely to accept evidence that online images have been manipulated and how they subsequently revise their emotions and beliefs surrounding them. This work also looks at potential ways cyber attackers could use social media to subvert social order by spreading visual misinformation, and what strategies would be effective in combating such behavior. Results from this work will inform the design of software for forensic image analysis and will lay the grounds for new technologies that help Internet users in continuously assessing the veracity of the mediated visual hoaxes and scams they receive online.
What if you aren’t planning an academic career?
Pre-proposal planning
(competitive intelligence)
Think about building your story ... starting now
Heilmeier Catechism

1. **What are you trying to do?** Articulate your objectives using absolutely no jargon.
2. How is it done today, and **what are the limits of current practice?**
3. **What’s new in your approach** and why do you think it will be successful?
4. **Who cares?**
5. If you’re successful, **what difference will it make?**
6. What are the **risks and the payoffs?**
7. **How much** will it cost?
8. **How long** will it take?
9. What are the midterm and final “exams” to **check for success?**
Finding funding
Your Environment

Research and Sponsored Activity

SPONSORED AWARDS
FISCAL YEAR 2016

- Industry 14%
- Gifts 14%
- State of Michigan 7%
- Foreign 2%
- Federal 60%
- All other sponsors 3%
- Crowdfunding <1%

FEDERAL AWARDS
FISCAL YEAR 2016

- US Department of Defense 32%
- US Department of Agriculture 7%
- US Department of Transportation 6%
- US Department of Health and Human Services 10%
- National Aeronautics and Space Administration 5%
- Other Federal Agencies 9%
- US Department of Energy 7%
Identifying the right opportunity

- Look at statistics and funded proposals
- Who is funding your colleagues? [https://federalreporter.nih.gov/](https://federalreporter.nih.gov/)
- Learn the funding organization’s objectives or the problems they are trying to solve
- Get past assumptions and read strategies and missions of funding organizations
Funder Types & Motivations

**GOVERNMENT**
Driven by national priorities
Budget set by congress, your tax dollars
Program directors are scholars but not all are specialists
They want to see you succeed – approachable
Annual competitions, often repeating
8-25 page proposals
Research/education
Generally peer-reviewed
Success rates 5-25%,
Competitions for graduate students/early career faculty
Larger $ amounts

**CORPORATE**
Adding brand and stock value, perception as a good corporate citizen, giving back to the community,
Driving the bottom line, being an employer of choice, encouraging employee volunteerism
Self interest – investing in K-12 and university programs for STEM education to build pipeline for qualified future employees

**FOUNDATION**
Mission Driven
Philanthropic
Family/Trustee
Competitive
Seed money, pilot projects, program development, new curriculum, publications, scientific / medical research
Outreach programs for underserved populations (including scholarships, access, preparation
Academic fellowships, recognition awards, young scholars
Tools to find funding
Writing
Think like a reviewer

<table>
<thead>
<tr>
<th>Excellent</th>
</tr>
</thead>
<tbody>
<tr>
<td>Very Good</td>
</tr>
<tr>
<td>Good</td>
</tr>
<tr>
<td>Fair</td>
</tr>
<tr>
<td>Poor</td>
</tr>
</tbody>
</table>

Great Idea, Well-presented

Great Idea, Poorly-presented

Poor Idea (Wrong Program), Well-presented

Poor Idea, Poorly-presented

Highly Recommended

Recommended

Not Recommended

NSF Panel

Program Officer

Funded

Not Funded
Montero added an RBI single and rookie Edwards Jr. got the first two outs of the 10th before walking Guyer and giving up an RBI single to Davis. Montgomery took over for Edwards and got Martinez to ground to Bryant at third for the most important 5-3 in Cubs history.
For the win

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After 108 years of waiting, the Cubs won the 2016 World Series with a wild 8-7, 10-inning Game 7 victory over the Indians on Wednesday night at Progressive Field. The triumph completed their climb back from a 3-1 Series deficit to claim their first championship since 1908.

A roller-coaster of emotions spilled out in a game that lasted almost five hours, featuring some wacky plays, a blown four-run lead, a 17-minute rain delay and some 10th inning heroics that sealed the deal.
Writing the Grant — Best Practices

- Start early
- Create an outline — use required proposal sections
- Figures and images are worth the space
- Simplicity over complexity
- Look at funded models
- Speak to the audience
- Style of the proposal should fit the agency (don’t recycle)

- The “extra” sections are also important
- Get lots of (critical) feedback — peers, research development offices, writing centers, consultants
- Writing resources — seminars, webinars, conferences, books
Follow the rules

- Observe page limitations/word count — there are no bonus points for wordy proposals. Will reviewers read every word?
- Observe margin requirements
- Observe font and point size requirements
- Incorporate headings and subheadings
- Incorporate ample white space it is not necessary to fill the page
- Does format matter? YES!
- There is no “one” correct way to write a proposal, but it is nearly ALWAYS preferable to cut details and make your proposal easier to read than to “cram” in everything you’d like.
Submitting proposals
(university protocol)
University/Organization Role

- To provide oversight! Almost always, organizations submit grant proposals, not individuals.
- To verify that all instructions have been followed (ex: NSF returns).
- To route the application for institutional approvals.
- To submit the application to the agency or foundation (many require institutional approval).
- Internal deadline (1 week to roughly 48 working hours prior to external deadline).
- You are part of this organization and many others are as well. BE STRATEGIC.
Solicitation checklist

- Eligibility requirements
- Goals and objectives of program
- Type of funding mechanism supported
- Availability of funds
- Required proposal sections
- Due dates (for letter of intent, pre-proposal, proposal)
- Contact information
- Information about previous awards
Getting better

Funding rates predict you probably won’t get funded your first time around.

DON’T GIVE UP!

Learn from reviewer comments and incorporate responses into your next proposal.
Resources to help you!

Peter Larsen - palarsen@mtu.edu
Federal, state, foundation proposals
Campus-wide efforts
Large, strategic university initiatives

Jodi G. Lehman - jglehman@mtu.edu
Federal, state, foundation proposals
Foundation relationship stewardship
Collaboration & team projects

Natasha Chopp - nichopp@mtu.edu
Superior Ideas crowdfunding
External private funding

Jessica Brassard - jnbrassa@mtu.edu
Federal, state, and foundation proposals
Early career faculty
Q1: Who is part of your network?
Q2: What is one of the questions from the Heilmeier Catechism?
Q3: On average, about what percentage of proposals are funded?
Q4: What is one way to identify funding for your research?
Q5: What are the three major types of funding agencies?
Q6: Where can you search for externally funded fellowships?
Q7: When should you start writing proposals?
Q8: Who can review your proposal before submitting?
Q9: For what reasons might a proposal be “returned without review” by a funding agency?”
Q10: Name an aspect of the university’s role in a grant proposal.