Rest of the semester

Assignment: Visualizing your research

- Overview visualization or diagram of your research
- Should not be a graph of results (unless it is particularly unique)
- Use diagrams.net or whatever tool your lab uses

Poster Session: Last day of classes

- Make a 1 slide poster that represents your research (can be in progress)
- Present your work during class (5 minutes)

Final Report (Dec 10th/19th)

- Combination of Overview, Literature Survey, Experimental Design, and Visual with some more text to glue them together

Consulting

1-on-1 meetings with me at end of each class

- ~10 minutes per student

Advice on how you do your research

- Focus on research process/methods, not your technical area

Come with:

- 1 minute overview of what you are working on
- What is going well
- What do you need help with (process-wise)

Schedule on website

- Starts today!
- Feel free to swap

Research Methods

CSCI 8901:
Grants and Creativity

Prof. Tim Wood
GWU

How are PhD students paid?

Teaching Assistant

Research Assistant

Your own scholarship

Funding in a University

Using GW as an example…

The CS department is allocated ~20 TA positions

- There are about 15 full time faculty
- What if I want a research group with > 1 student?

I need to get external funding!

Sources of Funding

Government

Industry

Non-profit organizations

Internal

US Government

Many different government agencies support scientific research

The big ones:

- Department of Defense (DOD)
- Department of Energy (DOE)
- National Institutes of Health (NIH)
- National Science Foundation (NSF)

NSF

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OSDBU Director

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Deputy Office Head

NSF CISE

Computer and Information Science and Engineering

- CCF: Computing and Communication Foundations
- IIS: Information and Intelligent Systems
- CNS: Computer and Network Systems
- OAC*: Advanced Cyberinfrastructure

Margaret Martonosi: Assitant Director

Types of grants

Core Programs

- Each division (CNS, CCF, IIS) has a general call for proposals
- Sizes: Small ($600K, 3 years), Medium ($1.2M, 4 years), and Large ($3M, 5 years)

Special Programs

- Full list: https://www.nsf.gov/funding/programs.jsp?org=CISE

Infrastructure-based grants

- MRI, CCRI, CSSI: funding for equipment or to support software development

Junior faculty focused

- CAREER - 5 years, $400K, must be assistant prof
- CRII - 2 years, $175k, must be unfunded

Grant Timeline

-9 months: Look for RFP (Request for Proposals) from funding agency

- Specify the requirements: specific areas, type of projects, special instructions, etc

-6 months: Start writing a proposal!

- Usually will be based off of some preliminary results - can't just be an idea in your head!

-1 month: Start university paperwork

- Grants office must approve submission and review all docs

-1 week: Submit draft to GW OVPR

- Check all sections for compliance. Mostly trivial stuff

Grant Timeline

0: Submit before deadline!

+3-6 months: NSF forms review panel

- NSF uses peer review
- More in a moment

+6-9 months: Receive acceptance/rejection

+12-18 months: Funding arrives!

- Lump sum, or year by year

+24, 36, 48 months: Submit Reports

- Annual and final reports on progress

GPG

Grant Proposal Guide

Gives all the general guidance for any type of NSF grant

- Formatting
- Bio sketch requirements
- Definition of terms like Broader Impact and Intellectual Merit

Intellectual Merit

The Intellectual Merit criterion encompasses the potential to advance knowledge

Kind of vague

What are your technical contributions?

Broader Impact

The Broader Impacts criterion encompasses the potential to benefit society and contribute to the achievement of specific, desired societal outcomes

More specific: how will you make the world a better place

- Impact of new technology on society
- Impact of your specific educational and outreach plans

Is it equally important?

- In practice, generally no.
- But you need to have it covered!

Parts of a Grant

Summary Page

- 1 page description of IM and BI
- Perhaps the most important page of the grant!

Proposal body

- 15 pages, single column, single space, not including references
- Specific sections on IM and BI

Data Management Plan, Facilities Document

PI Bio Sketch

Budget

Current and Pending

Summary Page

An extended “abstract”

Needs to get reviewer interested in your work

High level overview of the 3 things the grant will do

- Why 3?

Description of IM and BI

Ask your advisor if they can share a grant with you!

- Especially if you are funded by one it is good to see what they proposed

Proposal Body

Introduction

- Motivate importance of problem, introduce key ideas, brag about PI qualifications

Research Thrust 1…3

- High level plans of what you will do
- Preliminary results of what you've already done
- Emphasize key challenges and insights
- Avoid describing a "fishing expedition"

Evaluation Plan and Milestones

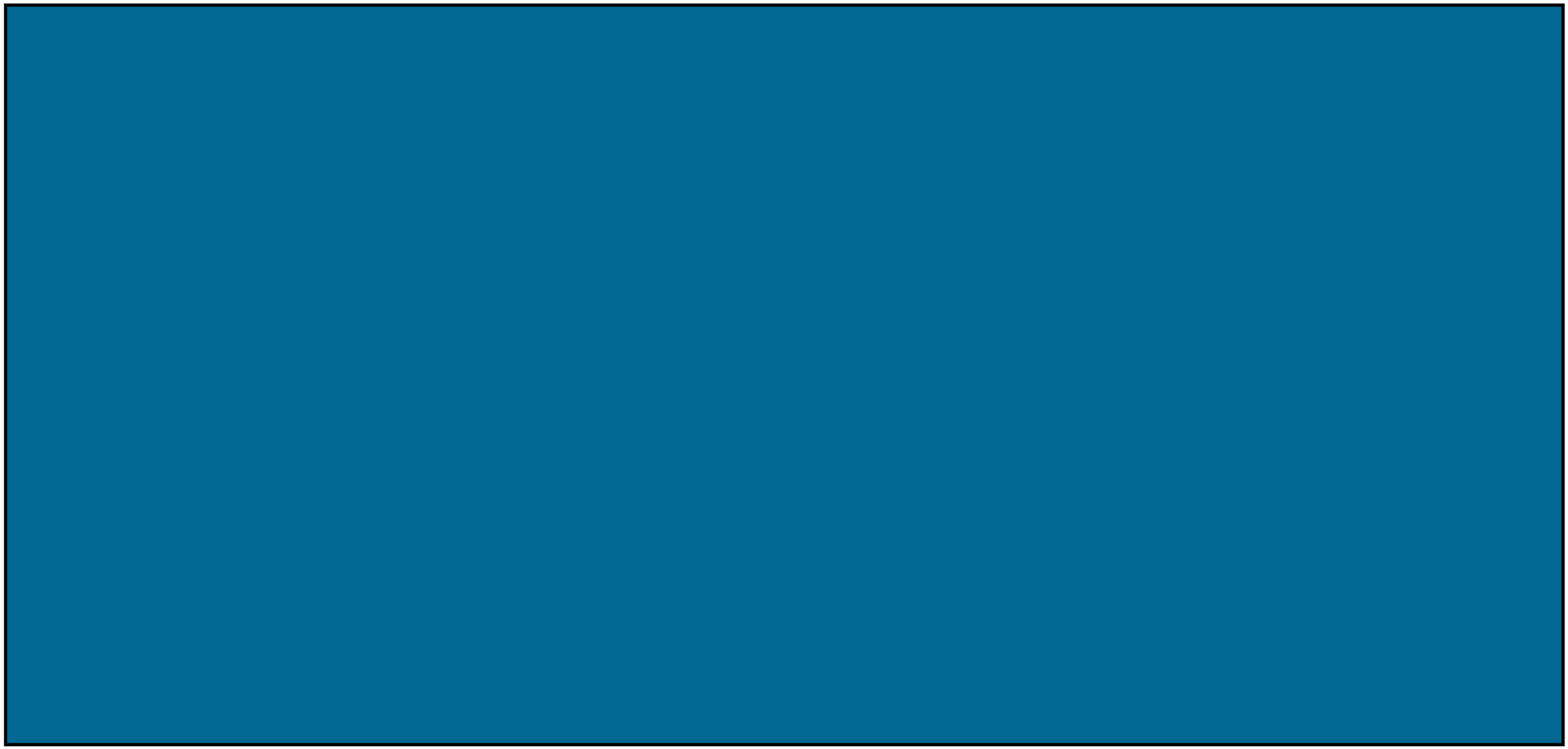
Broader Impacts

- Societal impact
- Educational plans - new courses, K12 outreach, undergrads, etc

Budget

Small grant is typically $500K for 3 years

Spend it on…?



3 Year Budget

	Balance
$500K sounds like a lot!	$500K
- it disappears fast…	
You probably have a Co-PI	$250K
University overhead is 59.5%	$104K
PI Summer salary (0.5 month)	$75K
PhD student salary ($30K/year)	$-15K
Tuition ($11K/year)	$-48K
Travel ($4K/year)	$-64K

Needs some creative accounting…

NSF Reviews

Program Managers group incoming grants by topic

Arrange **panels** to discuss and review

Panel is ~10 reviewers

- Faculty, industry
- Prefer faculty who have had a grant funded before

Each panelist reviews 6-8 grants out of ~15 total

- Carefully read and write a review before panel date

2 day review panel meeting

- in person / online
- 8 hours of discussing proposals
- Lead introduces, scribe makes notes

NSF Reviewing

Panelists need to assign a score to each proposal

- Highly Competitive: (~2) very likely to be funded
- Competitive: (~5) might get funded after comparison with other panels
- Low Competitive: (~8) not likely to be funded, can resubmit
- Not Competitive: (0-1) totally irrelevant

NSF program managers make funding decisions based on "guidance" from the panelist reviews and scores

- Take input very seriously!

Proposal Recipe

Leverage your current work and expertise

- **You** should be the perfect person to solve the problem, design the algorithm, or build the system you propose
- Technical content needs to be strong

Have preliminary work

- Convince people you have the start of a solution
- Unfortunately (?) most funding agencies are risk averse

Understand the norms for the funding agency

- Get sample grants, read solicitations carefully, attend an NSF panel once you can

Write your proposal well

- Reviewers will judge you by the end of the first page!