CRA Career Mentoring Workshop
Research Funding Overview

Fred B. Schneider
Samuel B. Eckert Professor
of Computer Science
Cornell University
Governments Fund Higher Ed

Why?

● Create educated citizens
  – Believed important in a democracy

● Facilitate higher quality of life for citizens
  – Improved health
  – Economic advantages
  – Military advantages

● Cheaply create a consulting capacity for gov
The pioneer spirit is still vigorous within this nation. Science offers a largely unexplored hinterland for the pioneer who has the tools for his task. The rewards of such exploration both for the Nation and the individual are great. **Scientific progress is one essential key to our security as a nation, to our better health, to more jobs, to a higher standard of living, and to our cultural progress.**

Letter to President Roosevelt
Governments Fund Higher Ed

How?

● Own and pay for universities
  - versus -

● Provide funding for students to attend university
  - Educated population
  - Reduces youth unemployment
  - versus -

● Provide “research grants” to universities
Industry Funds Research

Why?

- To create an educated workforce
- Incentivize research concerning key problems
  - Seek: enhanced understanding vs specific solutions
- Facilitate access to top minds
  - Students (hiring)
  - Work with faculty (consulting)
- Great value (tax credit)
Mechanics: Instruments

- **Contracts**
  - Quid pro quo. Real deliverables

- **Grants**
  - Direction can change. No deliverables.

- **Gifts**
  - No constraints. (Typically very low overhead)

Recipient: Your employer – not you.
- Consequences: portability, control, ...
Funding Sources

Government agencies. E.g.,
- DoD-related Agencies (ARO, AFOSR, DARPA, DHS, NSA, ONR)
  - 6.1 = Basic Research
  - 6.2 = Applied Research
  - 6.3 = Advanced Technology Development
  - 6.4 = Demonstration and Validation
  - ... [6.5, 6.6, 6.7]
- National Science Foundation (eg CISE)
  - NSF Funds 86% of University-based research in CS
- Dept of Energy
- National Institutes of Health

Industry, E.g.,
- Companies: Facebook, Google, IBM, Intel, Microsoft, ...
- Consortia: Semiconductor Research Corporation (SRC), ...
The following illustration shows the percentages of the FY 2014 budget requests by PCA.

- HEC I&A: 27%
- HEC R&D: 10%
- CSIA: 20%
- HCI&IM: 21%
- LSN: 9%
- HCSS: 5%
- SDP: 5%
- SEW: 4%
The following illustration shows budget trends by PCA since FY 2000.

Budget Trends by Agency


DOD includes OSD, NSA, and DoD Service research organizations. DOE includes DOE/NNSA, DOE/OE, and DOE/SC. OTHER includes AHRQ, DHS, EPA, NARA, and NOAA.

Source: NITRD: Supplement to the President’s FY2014 Budget Request
U.S. R&D Funding by Source, 1953-2007
expenditures in billions of constant 2007 dollars

Source: NSF, Division of Science Resources Statistics. (Data for 2007 are preliminary.)
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Ecosystem of Funding

- Who defines the topic:
  - Individual PI
  - Community driven (e.g., workshops) program defn
  - Program manager driven program defn

- How are funding decisions made?
  - Peer review
    - written reviews -versus- panel reviews
  - Gov insider reviewers
  - Program manager alone
Research, write, plus...

- Include an acknowledgment of funding source in every publication.
- Provide status reports (3 mos, 6 mos, 12 mos)
  ▪ Provide slides so PM can present your work.
- Attend PI meetings (annual)... other meetings.
- Give briefings to PM... To others at agency
- Work and integrate with other funded projects
- Subject work to outside evaluation
Means to an End?

Funding **is** a means to:

- Purchase labor (students, postdocs, staff)
- Purchase equipment (computers, etc)
- Purchase time (PI release time)
- Being active in your research community
  - Travel to conferences, meet with peers, ...

Funding **is not** an end:

- Funding level is not a measure of academic success
- Funding can come with obligations that distract from doing research.
- Group size is not a measure of success
Proposal Writing 101

- Follow the directions in solicitation (RFP)
  - Font size, section headings, margins, length, ...
  - “Synergistic activities” sometimes are expected [NSF]
  - Collaboration with funder sometimes sought [DoD, Ind]

- Sometimes: White paper → Full proposal

- A “good” problem is not good enough to be funded
  - Evidence that you have basis for solution.
  - Surprises/difficulty that superficial intuition won’t get

- What to make of the reviewer comments