How to Write a Good Research Proposal

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Background
• India Institute of Technology, Delhi (B.Tech. 1986)
• Stony Brook University (MS 1989; PhD 1991)
• Kansas State (1991-2014, Prof, Chair)
• Syracuse University (2016-2019 Assoc Dean)
• NSF (2014 – 2016: Program Director, 2020-2023: Div. Director
• George Mason University (2023-present, Divisional Dean)

Research
• Distributed Computing, Real-time Systems

Funding Sources: NSF, DARPA, AFOSR, ARO, FDA

Life Balance: 2 kids; Sports (mainly watching)

Proposal Writing Lesson Learned

“Panel is always right”
Katie Siek

Background
- Eckerd College (B.S. 2000)
- Indiana University (MS 2004; PhD 2006)
- CU Boulder (2006-2015, Assistant Prof)
- Indiana University (2006-2015, Associate; 2020 Full & Chair)

Research
- HCI & Pervasive Computing in Health & Wellness
- Undergraduate Research Opportunities

Funding Sources: NSF (CISE, SCH, IIS), NIH (NIBIB), RWJF

Professional Activities: CCC Council, CRA Board, SIGCHI

Life Balance: Dual Career Opp; 2 kids; Running; National Parks

Proposal Writing Lesson Learned
“If it’s a 10% accept rate, I should write 10 proposals to hit one.”
Activity: What will they remember?

Think about a proposal/research idea you are excited about

Think about what 3-5 words you want reviews to remember about your proposal

Give your elevator pitch to someone

Ask what 3-5 words they came away with
Your Prior Work

- Know who you are submitting to
  - Year 1: Systematic Review
  - Year 1: Hit the road doing research

- Innovative, not too incremental

- Show off your skills
Your Prior Work

• Know who you are submitting to
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• Innovative, not too incremental

• Show off your skills
Your Biographical Sketch

• Products/Publications [show your skills]
  • I don’t have 10 products

• 5 Distinct Examples of Broader Impact
  • “transfer of knowledge”
  • “synergistic”
  • Think of your 3-5 words

[whispers] Update your website

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Professional Preparation
Eckerd College, St. Petersburg, FL
Indiana University, Bloomington, IN
Indiana University, Bloomington, IN
Computer Science
M.S. May 2004
Computer Science
Computer Science
B.S. May 2000 (High Honors)
Ph.D. July 2006

Appointments
9/06-present Assistant Professor, Department of Computer Science, University of Colorado at Boulder
08/06-09/06 Research Faculty, Department of Computer Science, University of Colorado at Boulder
09/03-08/06 Research Assistant, Computer Science Department, Indiana University at Bloomington
09/03-05/06 Developer, School of Nursing, Indiana University at Indianapolis
05/02-08/02 Intern, Sandia National Laboratories, Livermore, California
05/01-08/01 Intern, Sandia National Laboratories, Livermore, California
05/00-08/00 Intern, Sandia National Laboratories, Livermore, California

Publications
Five most relevant publications

Five additional publications
Research Proposal
RQs/Specific Aims: have to have them

- RQs/Specific Aims
- Methodology
- Product Outcomes/Deliverables
- Access to Resources
- Budgeted Resources
Research Proposal
Methodology Sweet Spot: detailed, but not too detailed
Research Proposal
Link your RQs to your Methods to your Products
Research Proposal
Show you have access to resources and budgeted for others

RQs/ Specific Aims
Methodology
Product Outcomes/ Deliverables
Access to Resources
Budgeted Resources

Pro Tip
Need a letter from your chair? Draft it for them
Proposal Handling

- Proposal Submission
- Binning into panels
- Panelist selection
- Review assignment
- Panel
  - X panelists; 2X proposals
- Portfolio selection
What you should do

- Write one-page abstract
- Contact program officer
- Volunteer to serve of a panel
- Get done early
- Get feedback from others

Talk to the program director – before and after

- Submission
- Binning into panels
- Panelist selection
- Review assignment
- Panel
  - X panelists; 2X proposals
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The DOs

• Be bold in your vision (unlike a paper, where you’ve already done the work)
• Repeat, repeat, repeat
• Ask for other proposals related to the agency or proposal call (should come from you and not your chair, dean, research administration, etc.)
• Get done early
• Know your audience (Reviewers / PM)
  • Figure out what the reviewer thinks about and what PM thinks about
  • For the + outside of research, connect with portfolios (REU sites, Infrastructure grants)
DON’T, DON’T, PLEASE DON’T

• Don’t ramble – use your arguments
• Don’t use a lot of jargon (when do - always define)
• Don’t pack in everything, but the kitchen sink
  • Don’t add research items that do not fit the overall goals (disjointed set of activities)
• Reviewers will get tired - remember, yours might be the first one they read or the 10th one (and probably while on a plane)
CAREER proposals

• Cater to different expertise levels (more important for CAREER panels)

• Additional elements of a CAREER proposal
  o Should advance you toward your life goals
  o Should be a stepping stone to the next thing
  o Should be compatible with your department and institution goals
    o Will it enable you to collaborate with others?
    o How will it enhance research in the department?
    o How will the educational effort advance the department?
  o Should represent a contribution to society at large

• Selling the goals; not the technical details
Think about a proposal/research idea you are excited about

Why should the...

... generalist (in your field)...
... deep domain expert (in your field)...
... Program Manager (portfolio fit/societal impact)...

talk out your answers with a new friend
Q&A