



**CRA**

Computing Research  
Association

# How to Write a Good Research Proposal

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*Divisional Dean*  
*George Mason University*  
*School of Computing*

*Katie Siek, Ph.D.*  
*Professor*  
*Indiana University*  
*Informatics*

# Gurdip Singh

## 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

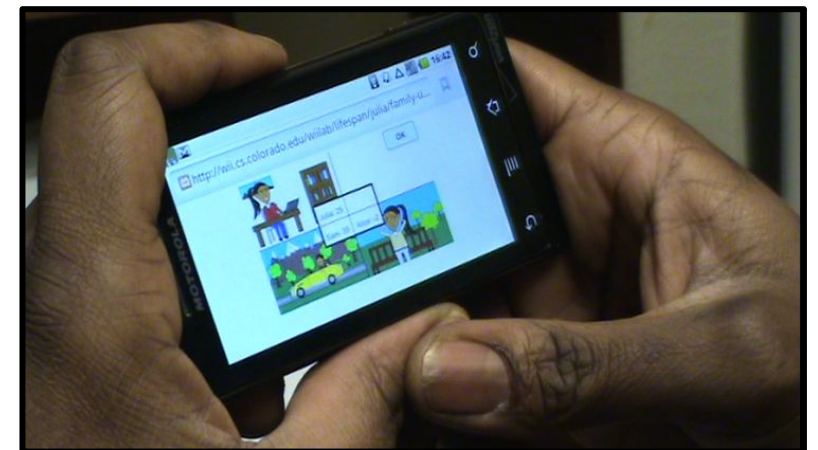
Think about what 3-5 words you want reviews to remember about your proposal

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



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Photo Credit: Ann Shertz

# 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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## Katie A. Siek

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## Professional Preparation

Eckerd College, St. Petersburg, FL	Computer Science	B.S. May 2000 (High Honors)
Indiana University, Bloomington, IN	Computer Science	M.S. May 2004
Indiana University, Bloomington, IN	Computer Science	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
08/05-05/06	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

1. K.A. Siek, K.H. Connelly, and Y. Rogers. Pride and prejudice: learning how chronically ill people think about food. In *CHI 2006: Proceedings of the SIGCHI conference on Human Factors in computing systems*, pages 947-950, New York, NY, USA, 2006. ACM Press.
2. K.H. Connelly, A.M. Faber, Y. Rogers, K.A. Siek, and T. Toscos. Mobile Applications that Empower People to Monitor their Personal Health. In *Springer e&i*, 123(4): 124, 2006.
3. K.A. Siek, K.H. Connelly, Y. Rogers, P. Rohwer, D. Lambert, and J.L. Welch. When do we eat? An evaluation of food items input into an electronic monitoring application. In *Proceedings of the First International Conference on Pervasive Computing Technologies for Healthcare*, November 2006.
4. K.A. Siek, K. Connelly, S. Menzel, and L. Hopkins. 2007. Propagating Diversity through Active Dissemination. *Computer* 40, 2 (Feb. 2007), 89-92. DOI= <http://dx.doi.org/10.1109/MC.2007.71>.
5. K.A. Siek and K. Connelly. Interdisciplinary Collaborations from a Health Informatics Perspective, In *The Informatics of Diabetes*, MIT Press, To Appear (2009).

### Five additional publications

1. K. Siek, Y. Rogers, and K. Connelly. Fat finger worries: How older and younger users physically interact with PDAs. In M.F. Costabile and F. Paterno, editors, *Lecture Notes in Computer Science: Interact 20s05*, volume 3585, pages 267-280, September 2005.
2. K.A. Siek, K. H. Connelly, A. L. Stephano, S. Menzel, J. Bauer, and B. Plale, “Breaking the Geek Myth: Addressing Young Women’s Misperceptions about Technology Careers”, In *Leading and Learning with Technology*, April 2006.

# 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

RQs/  
Specific Aims

Methodology

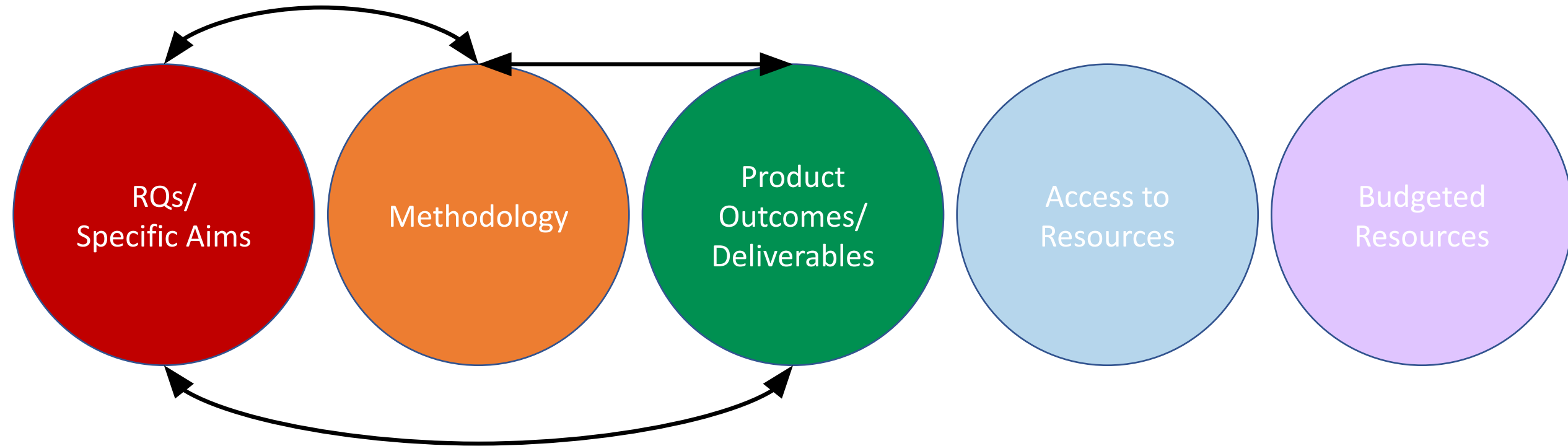
Product  
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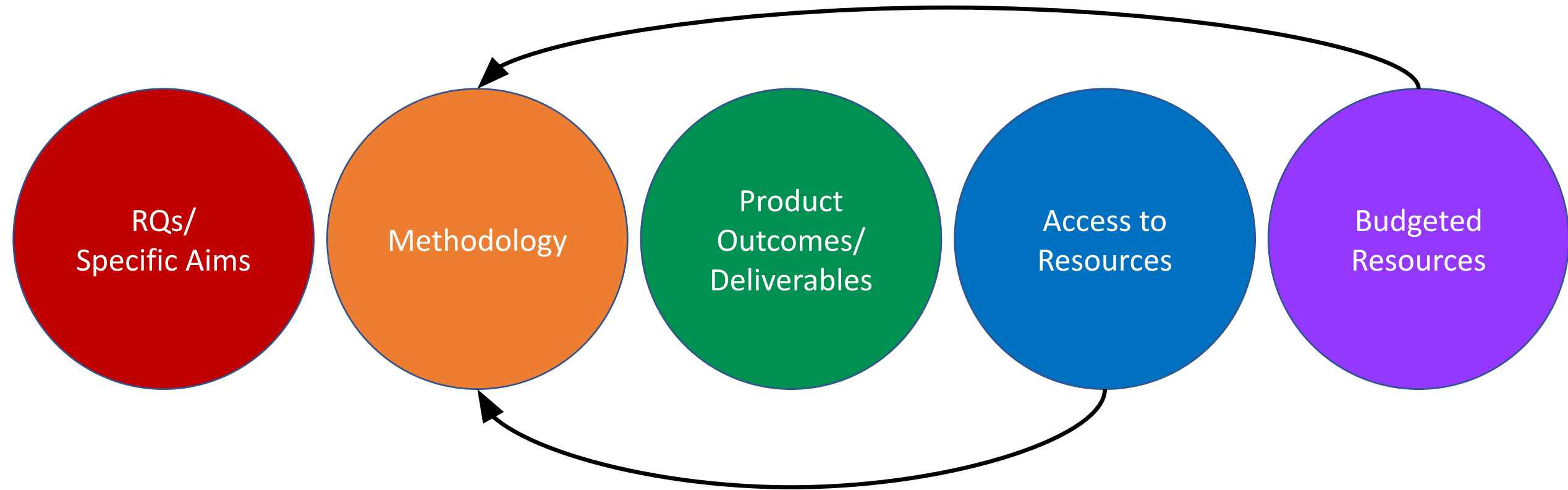
# Research Proposal

Link your RQs to your Methods to your Products



# Research Proposal

Show you have access to resources and budgeted for others




**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

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

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- Talk to the program director – before and after

# 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
  - Should advance you toward your life goals
    - Should be a stepping stone to the next thing
  - Should be compatible with your department and institution goals
    - Will it enable you to collaborate with others?
    - How will it enhance research in the department?
    - How will the educational effort advance the department?
  - Should represent a contribution to society at large
- Selling the goals; not the technical details



# Activity: Who cares? Why?

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)...

care?

Talk out your answers with a new friend



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# Q&A