Growing Your Research Program

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CRA-W.org
@CRAWomen
Carol Frieze is the Director of SCS4ALL and Women@SCS, Carnegie Mellon University (CMU).

She was selected as the recipient of the 2017 A. Nico Habermann Award for devoting nearly two decades to promoting diversity and inclusiveness in computing. She has worked with and supported a wide variety of students including women, people with disabilities, and various age groups ranging from K-12 to graduate students.

Carol has contributed valuable research towards understanding the challenges diverse populations face, and in many ways, her research has challenged the existing narrative in the field. And it’s had impact: 48% of computer science majors in the 2016 incoming freshman class at CMU are women, far above the national average.
What does CRA-W do?
Individual & Group Research Mentoring

Undergrads: Undergraduate Research Experiences
Undergrads: Distinguished Lecture series/role models
Grad Cohort: Group mentoring of graduate students
Grad Students: Discipline Specific Research workshops
Academics/PhD Researchers: Group mentoring for early and mid career @ CMW, Grace Hopper, and Tapia

2400+ students & PhDs a year

Stay in touch: CRA-W.org, @CRAWomen, Facebook: CRA-W, Linked-in: CRA-Women
CRA-W Events at Grace Hopper

Visit the CRA-W Booth in the EXPO to learn more (#2050)

Attend another CRA-W Session
Wednesday (3): Thursday (3) or Friday (1)

Visit a CRA-W Table at the Student Opportunity Lab on Friday (Undergrads)

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a bit about Nancy…

Accidental Computer Scientist – thanks to Bellcore!
- BS Math & Econ, then MS & PhD in CS
- Texas A&M Faculty - 1995-present

Research: Applied Algorithms
- PhD in parallel computing & computational geometry; added robotics and (accidentally) computational biology
- Group: 3 postdocs, 12 PhDs, 3 MSs, 5+ BS /HS
  - 23 PhD graduates (10 profs, 8 research labs)

External Activities & Major Awards
- IEEE Robotics & Automation Society, CRA, CRA-W Co-Chair, NCWIT, Program Chair flagship robotics conference
- ACM, AAAS, IEEE Fellow; CRA Haberman Award; NCWIT Harold/Notkin Award

Other interesting facts about Nancy
- Husband Lawrence is also a CSE prof at Texas A&M
- Bernese Mountain Dogs – currently Fred & Wilma
- Recent Highlights: Bucket trip to Machu Picchu & Diving!
a bit about Sarita …

Research area: Computer architecture + systems
1987: B. Tech from IIT-B
1993: PhD from Wisconsin  Married with two-body problem
1993-99: Assistant Prof, Rice
2000-now: Associate, Full, Endowed Prof, Illinois Married with two-body solution; two kids

Research group: 7 PhD students
ACM fellow, Maurice Wilkes, ABI Woman of Vision
SIGARCH chair, CRA board, DARPA ISAT
Perspective (for Academics)

Tenure is not a destination or a goal
Purpose is not job security, but the freedom that results from it

Orchestrating your life only for tenure defeats its purpose
Most of your career post-tenure, but defined by pre-tenure habits
Pre-tenure = Preparing good habits for rest of your career

Almost all in your school will want you to get tenure, use help

There is life after being denied tenure (and often a pay raise!)
Top Five Things to Avoid

5. Poor (unhappy) personal life: I’ll work 24/7 until tenure

4. Blow off service – It is all about research

3. Blow off teaching – It is all about research

2. No work w/ students, collaborators, no talks, nobody knows you – work 24/7

1. A gazillion publications, but no impact
Top Things to Consider

Most schools care most about what other successful people think of you

**Reference letters**
Most people will write letters only if they know you/your work

**Research impact**
Not just from papers, but from conversations, talks, students, ...

**Personal impressions**

**Service** on PCs, leadership, ...

Most universities increasingly care about teaching
Defining a Research Program

What is the overall theme of your work?

What do you LOVE to do?

What are your short, medium, long-term goals?

What steps do you need to take now and in the future to meet those goals?
Defining a Research Theme: An Exercise

Get out a piece of paper
Come up with 1-2 sentences describing your research theme
Spend 1 – 2 minutes

How?
Pick your favorite papers and think about what they have in common
Look for ways your students’ projects connect

Use this theme as a way to prioritize
Some General Advice….

- Aim for impact & technical recognition
- Develop your reputation
- Invest in students
- Build collaborations with colleagues
- Collect the resources you need to do your work
Goal: Impact & Recognition

- Do top quality work that is central to its area
  - Not tons of papers, just a few strong ones
- Your papers should be considered required reading and papers in the field should cite/compare with your work
- You want to be the authority in your specialty
Develop Your Reputation

Identify a strong research problem with clear short-term, medium-term, and long-term goals

- Publish steadily in high impact venues
- Amplify through students
- Amplify through mentors
- Distinguish yourself from advisor, senior collaborators
- Selectively do service that enhances your reputation
Reputation = Work + Networking

Network
Attend *important* conferences
Volunteer selectively in conferences and professional associations
Help others

Self-promote
Give talks
Maintain your online presence
  • Your organization’s website
  • Your own website
  • Google Scholar/Microsoft Academic/Research Gate
  • Social media
Invest in Students

• Students multiply your impact
  – Good students can be exhilarating
  – Bad students can be draining (not just on funding)
  – Choose carefully

• Advisor-advisee is a highly symbiotic relationship
  – Usually student’s success is advisor’s and vice versa
  – Every investment in your student is worth it (and your job!)

• Many schools require evidence of grad student advising –
one or more PhD graduates and several in the pipeline
Build Collaborations

• Collaborations expand your mind and your reputation
• Choose people you enjoy and can work with
• Compatible or complementary skill set
• Senior collaborators open doors/get grants; junior collaborators present new directions and do more work
• Be generous with co-authorship on publications and giving credit in talks
• Explore broadly, including interdisciplinary work
Build Collaborations

Do

- Communicate effectively and be responsible
- Make sure you have an impactful part of the project
- Have a contingency plan

Don’t

- Be a “student” for someone else
- Take it personally if a collaboration does not work
- Expect collaborators to change
- Be the programmer or tech support for another discipline
Relationship Between Academia and Industry/Labs

Working across academia – industry – labs = win-win

- Research impact
- Students
- Funding
- Cultivating relationships
- Publishing
Funding

• Look for new proposal opportunities
  • Early career proposal calls (DOE, DOD + NSF)
  • Opportunities to collaborate
  • Internal funding grants and travel grants
  • Faculty Fellowships: NASA, Microsoft etc.
• Learn the ropes by teaming with senior colleagues
• Review some proposals (but not too many)
Top 10: How to Write a Bad Proposal

1. Submit a research paper as a proposal
2. Make the scope too large
3. Make the scope too small
4. Ignore agency’s mission / history
5. Keep your best ideas for later
6. Ignore RFP details and use rudimentary tools
7. Wait until the last minute
8. Don’t get feedback on drafts
9. Grab as much budget for yourself as possible
10. Give up after first rejection
Be Your Own Advocate

Present and showcase your work regularly and broadly (not just in a narrow area/field)

- Elevator speeches
- Blogging, microblogging, social media
- Departmental seminars, symposia, manager meetings
- Outreach venues

Meet program managers and organizational leaders who can have influence on your funding

Go to visioning/leadership meetings

Network your best students, reflected glory
Be Your Own Advocate

Take credit for your work
Avoid people who do not give you credit
Find advocates and nurture them
Own your success, brag appropriately
Believe in your agenda; don’t give up, don’t take “no” personally
In closing

Enjoy what you do… it’s a great career
Feel and share the passion in research

Remember to take time for yourself and don’t forget to indulge yourself – it will keep you healthy and more effective overall!

Don’t pull the ladder up!
THANKS

Please rate and review the session in the GHC 17 mobile app

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