

# Bringing Undergraduates into your Research Program

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# My Experiences with Ugrads

- **20+ ugrads have worked with my group in last 8 years**
  - About half in summer programs, half during academic year.
    - About 2/3 from Texas A&M, 1/3 from other schools.
  - They have made significant research contributions
    - More than half have published
  - Most have gone on to grad school, some (6) at Texas A&M, others at Berkeley, Stanford, CMU, UIUC, etc.
    - recipients of grad fellowships such as NSF, DOE HPC, etc
- **My Expectations and Logistics**
  - I require a 10 hr/wk, 2 semester commitment
  - The goal is 1+ conference papers during their time with my group
  - Each ugrad works closely with a grad student (good for both)
- **They have been a great addition to the group**
  - it's more fun, the grad student's get advising experience, etc.
- **I also currently run the CRA-W DMP program**

# Outline



- Recruiting Ugrads to do Research
- Undergraduate Research Mentoring
- Integrating Ugrads into your Group
- How to Fund Undergraduate Researchers
- Possible Pitfalls

# Recruiting Undergrads for Research

- Getting the right students interested in research
  - Advertise w/ honors programs, ACM/IEEE student chapters, ...
  - Talk it up in your classes and encourage undergrads to attend research seminars (I assign CS Culture assignments in my classes)
  - Recruit top students in your classes
  - Remind them undergrad research strengthens grad applications
- When is the best time to get started in research - early in undergrad career or later? There are tradeoffs
- Tradeoffs between summer and academic year experiences

# Undergrad Research Mentoring

- Picking Appropriate Research Problems
  - Should be in line with your current interests
  - Doable with basic CS background
  - Need `bite-size' topics doable in semesters vs. years
- Expectations & Goals
  - They won't work as much as grad students, but you should set guidelines as to what you expect (e.g., 10 hr/wk, breaks)
  - While undergrad projects are typically smaller, they can be publishable. Both you and the student will benefit if this is a stated goal, and they will have more in common with grads.
- Logistics of Mentoring Undergrads
  - Need frequent feedback (grad mentors can help here)
  - Some mentoring tips available on DMP website

# Integrating Ugrads into Your Group

- Integrate them into an ongoing project
  - They'll get more help and interest from you/your group
- Have them work closely with a grad student
  - The ugrad gets someone more accessible (and less intimidating) to guide them, answer small questions, etc.
  - The grad gets advising practice & help on their research
  - Meet regularly with ugrad & grad mentor – keeps them on track and helps teach grad student advising skills
- Include them in all group activities
  - group meetings, presentations, reading & reviewing papers, bring them to conferences (if co-author), etc

# How to Fund Undergrads



- Academic year programs
  - REU Supplements to NSF grants
  - CRA-W CREW Program supports teams of female students and a professor at their institution
- Summer programs
  - CRA-W DMP program matches female students and profs for research experience at mentor's institution
- Local programs at your Institution
  - summer and academic year

# Possible Pitfalls



- Ugrads have difficulty allocating research time given class deadlines
  - insist on an agreed upon, regular time commitment, like a job would ask
  - paying them can allow them to cut down on outside work
- Resume builders without real interest
  - Try to identify these early, and let them go as soon as you (or they) figure it out
  - Research is not for everyone, and that is ok

# Remind them about Grad School

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- Make sure talented students consider keep grad school on their radar
  - grad school and fellowship applications
  - Studying for and taking the GRE
- There is evidence that women who go to grad school often have had an undergrad research experience
  - it is important to help faculty and future faculty learn how to make it work as a positive experience