



# Thoughts on Outreach

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# Why Do Outreach?

“Reflect that in reality you have a greater need to serve than they have of your service.”

– Angela Merici



# Where To Do Outreach?

- If you haven't been in a public school since you received your PhD, you aren't doing outreach
- We need more kids who want to pursue STEM careers
  - You can't reach them unless you go to them
  - If you're not reaching them, your outreach is low-impact



# What Topics Should Your Outreach Cover?

- Bad: your research, lecture format, theoretical stuff
- Good: interactive, hands-on stuff they can do, understand, and appreciate,
  - But that they can't do anywhere else
- Remember: the goal is to make them want to fill the STEM pipeline
  - Not necessarily even in your field
  - You are building relationships
  - “When I grow up I want to be ...”



# Key Attributes

- Outreach must be sustainable
  - A one-time outreach activity:
    1. Has a high fixed cost
    2. Doesn't inspire kids, because it lacks follow-up
    3. Doesn't impress the NSF (see #1 and #2)
- Outreach must be *good*
  - High-energy, hands-on, fun
  - Something they won't get in the classroom
  - You don't have to invent it yourself
  - Maybe you can incorporate things you already do
  - Bring undergrads to help you



# Sustainability Is Worth It

- ~40 hours to prepare and execute a good program
  - 2% of your work-year if you only work 40 hours per week
  - My suggestion: spend the time supervising undergrads who build the program and participate in it
- Then ~12 hours to do it the next year
  - Prep time + actual events
- You are building a relationship, not a bullet point



# My Outreach Story (2012)

- I live close to an elementary school
  - Contacted kindergarten teacher about doing a 1-hour presentation about robots (using robots that an undergrad made as a first-year project...I'm not a roboticist)
  - 24 kindergarten kids
  - 1 hour of hands-on interaction and conversation
  - Brought 3 students with me
  - Split kids into 4 stations
  - It was exhausting, but fun





# My Outreach Story (2013)

- Did the same thing, but for two classes in the same day
  - Twice as much impact
  - Two hours of work (plus some effort to get robots running again... maybe 10 hours total)
- Learned that the school was starting an after-school enrichment program in the fall
  - Volunteered to do a 6-week course (1 hour/week)
  - Simple stuff... taking a computer apart, playing with hardware, intro to programming concepts, robots (of course), intro to algorithmic thinking
  - 1<sup>st</sup>-5<sup>th</sup> grade





# My Outreach Story (2014)

- BASD will be offering an engineering curriculum in its high schools starting this fall
- Invited identified 8<sup>th</sup> graders to a campus event I was hosting anyway (mobiLEHIGH)
  - I ran a 30-minute session about game programming
  - 10-minute talks by guests from Microsoft, Yahoo!, and Google
  - 60 minutes playing video games written by Lehigh students, voting for their favorite
  - 30-minute Q&A with undergrads about college
  - Bought a lot of cookies and soda, paid for a bus



# My Luck, Your Opportunity

- You can't just walk into a random school and volunteer
  - Some schools don't have established outreach activities... they need more than you can do
  - Some schools have expensive outreach activities... they just want to pay DSC and others
- You want the stuff that falls in between
  - See me for info about how to sign up for a 6-week program in the fall at a public K-5 school ([spear@lehigh.edu](mailto:spear@lehigh.edu))
  - You can limit how many students, what grades



# Selfish Motivations for Good Outreach

- You want to have high-impact, sustainable outreach *that doesn't take long to explain*
  - Outreach isn't the focus of your CAREER proposal
  - One or two strong paragraphs plus a link to a website
- Past/present tense is better than future tense
  - It's like "preliminary work" in the research sections
  - Gives the reviewer confidence that you'll succeed
- It makes you a better researcher and educator
  - Can you (and a few undergrads) excite 4<sup>th</sup> graders about your field?



# Questions?

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