

Contemplating Collaboration

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Why am I talking about this?

- I might collaborate slightly more than average:
 - CS: systems, DB, HPC, security, networks, vision, graphics, network science, ML, NLP, AGT
 - Math: dynamical sys, spectral theory, NA
 - EE: MEMS, power grids
 - CEE: remote sensing, computational mechanics
 - ORIE: surrogate optimization
 - List gets longer if we remove the “resulted in a paper” filter.
- I have opinions that I’m willing to inflict on you.
- I needed to find someone to talk in the series!

What constitutes collaboration?

- Hallway, office, or dinner conversation?
- Joint grant?
- Joint paper(s)?
- Running something together?

Why collaborate?

- Geeking out with friends is fun!
- To improve your research and impact
- To connect theory and practice
- To expand your professional network
- To learn something new
- To teach something old

Some brass tacks

- Collaborations build your reputation
 - You need letters from experts who know your work
 - Network effects matter a lot for opportunities
- Collaborative work is judged differently
 - People ask who did what, who was a leader, etc
 - Distinct roles can help in assigning credit
 - This is a big benefit of collaboration across areas
- Collaborations are a type of professional relationship
 - Lots of failure modes available – people are messy
 - You can get out if it goes bad
 - Patience and forgiveness goes a long way

Dimensions of collaboration

- Varying relative experience of participants
 - Faculty, postdoc, PhD student, undergrad?
- Variation of disciplinary specialty
 - Same subfield of CS? Both in CS? Across fields?
- Size of the collaboration

Dimensions of collaboration

- Varying relative experience of participants
 - Faculty, postdoc, PhD student, undergrad?
 - Some collaborations persist across stages
- I've mostly collaborated outside my area
 - This is partly about going where needed!
 - Primary exception: my students
- I've mostly been in small-ish collaborations
 - Current work on stellarators is a notable exception

How it usually works for me

- The “can I ask you a question?”
 - Personal example: network tomography, opinions, ...
 - This is probably my dominant mode
- The “let’s look at this.”
 - Personal example: much of my MEMS work
 - Also a lot of my work with my students
- The “you ought to look into this.”
 - Personal example: Power grids
- The “pulling together a team.”
 - Personal example: stellarator optimization

Some common issues

- Communication and timing
- Negotiating authorship

Communication and timing: principles

- Clear communication matters to any relationship!
 - Want to avoid duplicated work (and hard feelings)
 - But communication is not necessarily all-to-all
 - “Clear” and “voluminous” are not always the same
- Respect your collaborators’ time
 - Communicate availability up front
 - Not everyone can respond immediately
 - OK to ping for liveness

Communication and timing: logistics

- A deadline focuses the mind enormously
 - This can be a calendar entry for a meeting!
- Figure out shared tooling early
 - I usually work by notes + git repos
 - Others prefer Word or Google Docs
 - Talk through shared workflows

Negotiating authorship: principles

- Authorship in CS denotes substantial contribution to the work
 - “I got the funding” is usually not enough
 - “I had the original idea” is a different matter
- I try to be generous toward co-authors and strict toward me
 - Offer to just be acknowledged on a minor contribution
 - Offer co-authorship fairly (acknowledging multiple contribution types)
- Communicate throughout!
 - It’s useful to establish principles early.
 - The actual author list depends on how the work evolves.

Negotiating authorship: logistics

- Keep all authors informed throughout
 - CC on arXiv updates, reviews back, copyright in, etc
 - Co-authors should also be cc'ed on rejections!
- It is OK to request non-authorship
 - Be clear if it's because you think you played a minor role
 - Be diplomatic if it's because you disapprove of the work

Bridging collaborations

- I largely work with people from different backgrounds
- Challenges are different from in-area collaborations
- I'll focus on what I know best!

Clarifying the question

When your collaborator is posing part of the research question:

- Make sure you understand the vocabulary
- Push back to the base question
- Stop for clarification often
- Be patient with your collaborator and yourself

Different areas have very different styles of questions — pay attention to what is asked and the underlying subtext!

Knowing what you do and don't know

- You know different things from your collaborator
- You are not stupid
- The converse is also true
- Your job is to use conversation to learn
- Faculty also use students to help bridge areas!

Some anecdotes

From grad school days

- OceanStore
- SUGAR and MEMS
- CIS and sabbatical visitors
- Network tomography

From more recently

- Surrogate opt and Bayesian opt
- Opinion formation
- Power grids to radar propagation
- Stellarators