### The Finelli Lab: Improving the college experience for STEM students

### **Guiding principles**

The Finelli Lab aims to influence the practice of engineering education by: (1) researching faculty teaching practices and their impact on student learning and (2) establishing a more inclusive ecosystem for undergraduate engineering education. The lab fosters a supportive and flexible environment in which students develop their skills as researchers by designing research projects; securing IRB approval for data collection; collecting and analyzing data; exploring issues related to diversity, equity, and inclusion; writing and critiquing manuscripts; presenting work to the group for feedback; mentoring master's and undergraduate student researchers, and more. Ideal lab members should be self-directed, self-motivated, and curious; should embrace diversity and inclusion; should be open to learning new ideas about engineering education research; and should be eager to explore multiple perspectives.

### **Frequently asked questions**

Answers to frequently asked questions follow.

#### **Overall research lab**

- 1. What is Prof. Finelli's philosophy as an advisor?
  - Prof. Finelli aims to be supportive, flexible, and responsive. She sets high (yet achievable) expectations for student work.

#### 2. What types of opportunities are there for working together?

- Many grants are large enough that multiple graduate students will work on them, so you may work closely with another graduate student.
- Lab members generally present their work at group meetings, and they often organize "work together" sessions, so you will have an opportunity to provide and get feedback from other lab members.
- Occasionally, the lab has an undergraduate or master's student who is interested in engineering education research and who may help various lab members with their research.
- Prof. Finelli is open to working with other groups, and students are welcome to propose other collaborations, which are considered on a case-by-case basis.

### 3. What resources/mechanisms exist for addressing my concerns? How should I report abuse of power if I believe I see it?

As a first course of action, you should always bring your concerns to Prof. Finelli. However, if you are not comfortable doing that, you may speak with other students, other faculty, or the graduate coordinator in ECE or EER. In rare circumstances when none of these are viable options, you may contact the Michigan Engineering C.A.R.E. Center (https://care.engin.umich.edu/student-support-services/concern-report/), the College of Engineering's Director of Graduate Degree Programs (vkamat@umich.edu), or the University of

Michigan Student Ombudsperson (https://ombuds.umich.edu/), depending on the issue and your level of comfort.

#### Work expectations

- 4. How flexible are working hours in the lab? Are there regular team and/or individual meetings? How should I prepare for those meetings? What will my participation in those meetings look like?
  - Work hours are generally flexible, as long as you are making satisfactory progress.
  - At the start of each semester, Prof. Finelli will schedule time for a weekly or biweekly lab meeting (you should provide a copy of your weekly class schedule no later than the first week of the term). All students are expected to be present in-person at each meeting. You will be expected to lead a lab meeting once or twice a semester (e.g., review a paper or present an update on your current research topic). At lab meetings where you do not present, you will often be asked for feedback. You will occasionally have to read a paper or do other prep work before a lab meeting.
  - Most students have biweekly, one-on-one, check-in meetings with Prof. Finelli (ranging from 30to 60-minutes in length). These meetings should be driven by the needs of your project, and to prepare for them you should gather updates, organize questions, and outline issues on which you would like feedback.
  - You should prepare for the meeting by revising the "weekly updates" document (using the template provided by Prof. Finelli and saving it in the appropriate shared google folder) which includes sections for research activities and writing progress, skill development, lab service, issues requiring Prof. Finelli's assistance, and goals for the coming week. Be sure to send Prof. Finelli the link to your updated document the day before the meeting.
  - You can reach out to Prof. Finelli at any time to schedule a meeting.

#### 5. How do you balance work you're paid for and other professional development work?

- "Full" funding (which includes tuition, stipend, and benefits) is considered 50% time if you are funded by a grant, this means you are expected to work 20 hours/week toward that project. The other 50% of your time is for you to make progress on your dissertation, take classes, and engage in professional development work. Many students use the research project that provides their funding as a main part of their dissertation; this makes it easier to graduate on time.
- Students should discuss other professional development opportunities with Prof. Finelli so that

   (a) Prof. Finelli is aware and can offer appropriate support (e.g., financial support, academic guidance), and (b) students can identify ways that other opportunities might interrelate with their work in the lab. For example, when students have participated in professional development opportunities related to novel research methods, it is common for them to share what they learned with the lab in a meeting.

# 6. What are the expectations regarding vacations and time away from campus? How should I best plan for that? What is the time frame for notification regarding anticipated absences?

Student researchers should follow the UM employee calendar, rather than the university academic calendar. Accordingly, you are not expected to work during the UM-observed holidays and season days (<u>https://hr.umich.edu/working-u-m/my-employment/holidays-season-days</u>). Note that the academic calendar includes some days that are not part of UM holidays and

season days (e.g., fall break, MLK Day, spring break), so these are not automatic days off. Besides these days, you may take up to **two weeks** of vacation time each year (e.g., during the university spring break or summer). You are responsible for tracking the vacation days you have used each year.

• Planned vacation days should be discussed with Prof. Finelli in advance (preferably before you book plane tickets and at least one month in advance).

#### 7. What do students do in the summer?

- Students generally continue with funded research in the lab, devoting up to 40 hours/week to advance their research. Note, you are likely to have a 50% appointment whereby you will be paid for 20 hours of work; however, you should plan to devote additional time to progress towards your milestones.
- In some cases, students may take a paid summer internship related to their career. Such an internship is generally 40 hours/week and, therefore, students are not paid for work in the lab. Again, you may need to devote additional time to progress towards your milestones.
- There are a number of professional development programs during the summer. For example, in the past students have participated in ICPSR, the Big Data Camp, and other methods-related activities supported by Rackham, Finelli Lab, or other funds.

#### **Communication and feedback**

#### 8. What is the best way to reach each other? What are the expectations about response?

 Email is typically preferred unless an immediate response is needed. Lab members should regularly monitor their email and should generally respond to emails within 24 hours (or less!). Response times may be slightly longer over the weekend or holidays. Sometimes, a simple acknowledgment of having received the message with a note that a more detailed response will follow is sufficient. Texting can be a good option for an immediate response. If you feel comfortable sharing a cell phone number, this has worked well in the past.

### 9. How much time can I expect my mentor to need to provide feedback on written work, such as chapter and publication drafts?

- Generally, a two-week turnaround time is required for lengthy documents such as dissertation chapters and manuscript drafts. Before reviewing full drafts, Prof. Finelli would like to see an outline with key sentences (as described in the Tomorrow's Professor article #1802).
- If arranged in advance, Prof. Finelli may be able to provide quicker turnaround time, especially for shorter documents and for documents with upcoming deadlines.

#### 10. Are there other ways to get feedback

 Students are encouraged to get feedback from other students in the lab or in their graduate program. In addition, it may be helpful to work with <u>Sweetland Writing Center</u> or to reach out to other faculty at UM.

#### 11. How/when should I let my advisor know what I'm doing?

Generally, this occurs through the biweekly, one-on-one check-in meetings described previously
 please send the a link to your update document the day before your meeting, without expecting a request for this information from Prof. Finelli.

- You can reach out to Prof. Finelli at any time to schedule a meeting.
- 12. In what form and how often will I receive regular feedback on my work? How/when will my overall progress be evaluated?
  - You should expect to receive informal feedback from Prof. Finelli during your regular biweekly meetings. Depending on the specifics of your work, you may also receive more frequent feedback.
  - You and Prof. Finelli will likely draft a mentoring plan that you can revisit as needed. Annually, you will complete a Progress Report and will receive formal feedback (in February for EER students and April for ECE students).

#### Funding and research choice

## 13. What is the general plan for student funding? Will I be expected to apply for internal and external fellowships? Will I be expected to serve as a GSI?

 Generally, doctoral students are funded through a 50% appointment as (1) a Graduate Student Research Assistant (GSRA) on a funded project of Prof. Finelli's, (2) a Graduate Student Instructor (GSI), or (3) the recipient of an internal fellowship (e.g., Rackham Merit Fellow or department fellowship) or external fellowship (e.g., NSF Graduate Research Fellow or GEM Fellow). Students are encouraged to apply for both internal and external fellowship opportunities, and Prof. Finelli expects that her students will serve as GSI for at least one term during their graduate career. This experience will be valuable to them regardless of their future career path

# 14. How much freedom do I have to select my research topic? And how does this connect to funded research? (If I'm interested in XXX, will I be able to pursue it?)

- The level of autonomy you have in selecting your research depends on many things, such as your past coursework and research experiences, your seniority in the lab, the relationship of the research with the overall direction of the lab, the type of funding you are receiving, and your personal bandwidth. There is little flexibility to deviate from the proposed workplan for funded projects, especially if the project involves other senior collaborators.
- If you have another research topic of interest that you would like to pursue, please discuss it with Prof. Finelli. Together, you may be able to outline a plan for accomplishing that work.

#### **Graduation time**

#### 15. What is the typical coursework for a student in Prof. Finelli's lab?

 Students typically enroll in two or three courses as pre-candidates and in one course as candidates. Graduate students should discuss their course selections with Prof. Finelli well in advance of the start of each semester. EER and ECE students are encouraged to consider both an engineering or EER master's degree, respectively, and other credentials such as the Rackham DEI certificate, the cognitive Science Certificate, and the Teaching Certificate.

### 16. What is the typical timeline for taking the qualifying exam? Achieving candidacy? Proposing my dissertation research? Graduating?

• Students will typically take the qualifying exam during their fourth semester and will advance to candidacy by the end of year 2 (advancing to candidacy means completing required coursework

and passing the qualifying exam). The dissertation proposal exam will typically occur by the end of the third year, and you'll likely graduate by the middle of your fifth year.

#### 17. How long can I expect to spend in the lab before graduating?

 Even if you enter with a master's degree, learning the field of EER will take time. Probably, students can expect to graduate in 4 to 4-½ years, depending on the academic course load in the first year and on the student's research progress.

#### 18. What does it take to satisfy graduation expectations?

Doctoral students should expect to plan and conduct an independent research project. As with any scientific research, this includes identifying a compelling research question(s) aligned with the direction of the research lab, conducting a thorough literature review, collecting and analyzing data to answer the question(s), interpreting the data and displaying results in an intuitive way, and documenting the project by way of a dissertation. The project will likely take ~18-24 months to complete, and will probably result in multiple conference presentations as well as a few journal publications. The university's three paper dissertation is also an option (website)

#### **Professional development**

### **19.** What are the expectations regarding conference travel and presentation? What funding is available?

 Generally, students can expect to attend one conference per year - usually the ASEE Annual Conference. There are several funding opportunities through the university (e.g., Rackham, College of Engineering), which students should explore prior to each conference, and Prof. Finelli often has funding available for student travel as well.

#### 20. Will I be able to be an author on papers? What are the expectations regarding writing papers?

- Students in our labs not only author papers, but they are often expected to lead authorship on papers. After your first year, you can expect to be lead author on about one conference paper each year and at least one journal paper during your career. You will likely be co-author on many more papers.
- Students should use Mendeley for their reference needs.

#### 21. What are the disciplinary norms around authorship and author order?

- Authorship and author order should be decided as early as possible when embarking on a project. This avoids awkward conversations later and establishes specific expectations for everyone on the team.
- Regarding *authorship*, there are guidelines (e.g., published by the American Educational Research Association's Professional Code of Ethics, and the International Committee of Medical Journal Editors) for determining who should be co-authors on written work. In general, anyone who makes substantive contributions to (a) project conception and design, (2) data collection, or (3) analysis and interpretation of data should be listed as an author. Authors should be able to defend their contributions, be involved in drafting and/or revising the manuscript for important intellectual content, and approve the final version of the work. Accordingly, if you cannot explain the project's premise, design or analysis decisions, or conclusions, it's possible you might not have made a substantial contribution to warrant authorship.

- Individuals who do not make substantive contributions but who are involved in the work should be mentioned in the acknowledgements (and you should let them know you plan to do so in case they would prefer not to be named). The following activities *alone* do not qualify one for authorship: acquisition of funding; general supervision of a research group or general administrative support; data collection; and writing assistance, technical editing, language editing, and proofreading.
- Author *order* has more flexibility and fewer guidelines. In the Finelli lab, author order is generally commensurate with the contributions each author offers to the paper, and we follow two key guidelines. First if a student has been substantially involved in the project and writes the bulk of the manuscript, they are generally the first author. Second, other authors are roughly listed by how much they contributed, with the person serving as the student's key mentor generally being second author. The first author is expected to lead the organization of the paper (e.g., organizing other authors who will contribute to the paper), as well as the writing process, revisions, and communication with venues (e.g., journal editors, conference discussants).
- Discussing roles and responsibilities on the project will help determine the author ordering.
   Responsibilities to consider include: conceptualizing the project, formulating the research plan, collecting/transcribing data, analyzing data, writing text, reviewing text.
- Many journals require one of the authors to be listed as the *corresponding* author. This person is the primary source of communication for both the publisher and the readers, manages requests for data sharing, represents co-authors on copyright related issues, responds to readers' questions, etc. Prof. Finelli should be the corresponding author for manuscripts written by students in the lab.

#### 22. What opportunities will there be for networking with others at UM and outside of the university

There are multiple resources within EER, the College of Engineering, the School of Education, and the broader UM, including colleagues in your courses, student organizations (e.g., the Student Chapter of ASEE, Graduate Student Government), and community-building events. Students should attend department and EER seminars, taking advantage of opportunities to meet with faculty across the country. Also, students should approach conferences with a plan for networking.

### 23. What skills and abilities (writing, reviewing, mentoring, teaching, grant writing, quantitative/qualitative analysis, etc.) will I be able to develop? How can I acquire these skills?

- We participate in guided professional development opportunities. For example, students in this lab participate as ASEE reviewers, and in the process, we present our reviews to the team for comments and feedback on high quality reviewing.
- As the team consists of a variety of areas of expertise, opportunities for feedback and skills development related to writing and methodological training are plentiful. Students often present their work to the team for methods feedback.