

## Teaching, Mentoring, and Diversity Statement

### Poorna Talkad Sukumar

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I am extremely passionate about teaching and it is one of the primary motivations for my seeking a faculty position. I have performed my teaching-assistant (TA) duties in graduate school with utmost diligence and sincerity and in recognition of my efforts, I received an *Outstanding Graduate TA Award* by the Department of Computer Science and Engineering at the University of Notre Dame. I have developed intuitions on how to best communicate subject matter to students to foster learning as a result of having taken several computer science (CS) courses taught by some excellent teachers. As a faculty member, I will endeavor to provide the same high-quality service that I have been very fortunate to receive and contribute to students' learning and enhancing their thinking abilities.

#### Teaching Philosophy

Effective teaching is determined not only by one's expertise of the subject matter but also by their value system. I firmly believe that *anyone* can learn and master CS concepts and that no innate ability is required to succeed in CS. Drawing from my own research [1], I plan to recognize and address implicit biases and stereotypes surrounding students' learning abilities in my classroom and in academia, in general. I will take an equity-based approach to teaching wherein I will ensure that women and other underrepresented student groups receive adequate opportunities to participate in the classroom and support to succeed in the class.

I regard teaching as an important responsibility and one requiring diligence and dutifulness. As a TA, I have expended considerable time and effort in preparing course materials and for delivering lectures, graded student assignments fairly, and responded to student queries in a timely manner. I will continue to uphold the same attitude and be a responsible and dutiful teacher.

#### Teaching Experience

During my Ph.D., I served as a TA for three semesters and two courses—*Data Mining* and *Human-Computer Interaction (HCI)*. In the Data Mining course taught by Prof. Nitesh Chawla, there were more than 70 students in the class and my responsibilities mainly included grading all the student quizzes and assignments and holding office hours where I interacted with several students each week to clarify course content and provide guidance on assignment problems and student projects.

I was the TA for the HCI course taught by my co-advisor, Prof. Ronald Metoyer, for two semesters. In addition to grading duties and holding office hours, Prof. Metoyer also gave me the opportunity to create course content and deliver lectures as HCI is my main area of expertise. I created quizzes and assignments, delivered two lectures for which I created the presentation material, and conducted an HTML+CSS+JavaScript workshop to help students with their course projects. We implemented community-based learning as part of the course which required students to complete projects proposed from the local (South Bend) community members and organizations. Over the course of the semester, students interacted with diverse stakeholders and designed and implemented functional interfaces to support their specific needs. For example, one student group designed a mobile app to track produce inventory at a food stand at the South Bend Farmers' Market and another group designed a student attendance tracking system for the Robinson Community Learning Center, a center providing after-school tutoring to students from low-income households. Prof. Metoyer later conveyed to me that the students were very appreciative of my efforts and passed on this comment a student had written in the anonymous course instructor feedback, "*There's nowhere else to note it, but I'll mention it here. Poorna, our TA, is one of the hardest working and most dependable TAs I've had in my time at Notre Dame.*"

In an academic position, I would be very interested to teach *HCI* and *Data Visualization* courses, which are my main areas of expertise. In addition, I am well-prepared to teach core CS classes, including but not limited to *Data Structures*, *Programming*, and *Algorithms*. I have solid foundations in CS courses having taken several courses each at my undergraduate, master's, and doctoral institutions.

I will structure my courses drawing from the materials and approaches that I have found very useful for learning. For example, I have found Munzner's book [2] and tutorial [3] on *Visualization Analysis and Design* to be extremely useful for learning the fundamentals of visualization. For HCI and Data Visualization courses, I envision designing a syllabus that will combine theory and practice. Drawing from my TA experiences and the discussions at the recent *Visualization for Social Good* panel [4], I plan to implement community-based learning in these courses to

enable students to not only experience working with real stakeholders to solve their real-world problems and/or visualize their real-world data but to also learn to make ethical and socially-responsible decisions as they carry out their projects. I also intend to develop specialized courses at the graduate level, including *Research Methods in HCI* and *Research Topics in HCI and Information Visualization*.

## Mentoring Experience

I have provided both research guidance and advice on navigating graduate school to many students. I have helped students in my lab, including Anqing Liu, Qiyu Zhi, Micayla Goodrum, Shuai He, Tee Chuanromanee, and Shangyue Zhu with conducting their research, writing papers, and coping with paper rejections. As part of my department's Graduate Student Board (GSB) mentorship initiative, I mentored two first-year students, Vitor Albiero and Nicholas Botzer, and gave them guidance on balancing their coursework, TA duties, and research in their first year and courses that they could potentially take. I interacted with them a few times during the semester to provide personalized feedback and check in on their progress. Through the Graduate Society of Women Engineers (GradSWE) mentorship program, I mentored a graduate student, Dung To, in the Chemical and Biomolecular Engineering department and helped her with learning new programming languages, including Python and R.

Graduate school can be a struggle for many and I believe that it is very important to have mentors who you trust and whose guidance resonates with you. I am very fortunate to have my advisor and mentor, Prof. Aaron Striegel, taking an active interest in my success. Through his guidance, I have learned to be more patient and confident, think more broadly, and view problems from alternative, more helpful perspectives. Following his example, I will endeavor to provide personalized support to students, especially those who are more vulnerable, to enable them to succeed in graduate school and prevent them from dropping out. I will also mentor talented and motivated undergraduate students by, for example, leveraging the NSF REU program.

## Diversity

My life experiences have been shaped by being a woman and I have experienced firsthand the gender bias that women in academia face. While doing research on undergraduate admissions process in the United States [5], I read numerous books and articles which helped me understand the rationales for various admissions policies and practices, such as, affirmative action, and empirical evidence supporting the effectiveness of these policies. While these policies are mainly implemented at the institution and department levels, I believe that they must also be practiced at the individual level and especially by faculty members, who hold positions of power. In hiring students, faculty members can choose to provide opportunities to students belonging to demographic groups that have been unfairly treated in the past. Through their teaching practices and social interactions, faculty members can help change the mindsets of people towards creating more inclusive environments. As a faculty member, I will be deeply committed to supporting diversity and inclusion and I will hire women and students from underrepresented populations.

## REFERENCES

1. Talkad Sukumar, P., Reinholz, D., Shah, N., and Striegel, A., "Visualizing Participatory Inequities in Classroom Data," in *IEEE VIS 2020 Electronic Conference Proceedings [Poster]*.
2. Munzner, T. Visualization Analysis and Design. CRC press, 2014.
3. Munzner, T. VIS 2017: [Tutorial] Visualization Analysis & Design [Video]. <https://vimeo.com/241799817>
4. Battle, L., Borkin, M. A., Correll, M., Harrison, L., Peck, E., D'Ignazio, C., Metoyer, R., "Visualization for Social Good.", in *IEEE VIS 2020 [Panel]*
5. Talkad Sukumar, P., Metoyer, R., & He, S., "Making a Pecan Pie: Understanding and Supporting The Holistic Review Process in Admissions," in *Proceedings of the ACM on Human-Computer Interaction*, 2(CSCW), 1-22.