TEACHING STATEMENT

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1   Teaching Philosophy

The importance of a teacher cannot be overstated in any academic field. A teacher has the ability to inspire students to become lifelong learners, equip them with essential tools and skills for critical thinking and success, and empower them to be self-sufficient and confident in their education. For this reason, it is crucial for a teacher to possess a strong understanding of the subject matter while also being capable of adapting to the unique learning styles of each individual student. In the field of statistics, a logical and thorough analysis is highly valued in order to make sense of the world around us. With the right approach, a teacher can help students recognize the value of statistical analysis for any topic of interest. My teaching style focuses on cultivating this intuition by highlighting the motivation behind mathematics and demonstrating how its logic aligns with the common sense that every person already possesses.

During my early undergraduate years, I had the opportunity to teach a group of curious young children in a rural part of West Bengal through a literacy and teaching campaign organized by the National Service Scheme in India. This was my first experience with teaching, and I quickly realized the joy of sharing knowledge and the interactive process of lateral learning. As a student myself, I firmly believe in Swami Vivekananda's quote that "Education is the manifestation of perfection already in man", and I am convinced that it is the responsibility of a teacher to help students understand the true value of education.

As a doctoral student at UC Davis, I worked as a teaching assistant for graduate and undergraduate courses, allowing me to interact with students, colleagues, and professors from diverse academic and intellectual backgrounds, strengthening my teaching skills and love for the profession.

As a postdoctoral scholar at Penn State, I teach a diverse group of students in an Introduction to Probability and Stochastic Processes course. I promote the assimilation of key concepts over memorization by assigning group projects that model real-life problems from students' familiar areas, applying appropriate statistical models computationally. I am also learning various topics in Electrical Engineering, Computer Engineering, and Psychology alongside my students.

2   Teaching Experiences

Instructor (with full responsibility), Department of Statistics, Penn State university

- **STAT 418** (Introduction to Probability and Stochastic Processes), upper-division undergraduate level *(Spring 2023)*.

Instructor (with full responsibility), Department of Statistics, UC Davis

- Fall 2021 **STA 131C** (Introduction to Mathematical Statistics), upper-division undergraduate level *(Fall 2021)*.

- **STA 106** (Analysis of Variance), upper division under- graduate level *(Fall 2019)*.

Teaching Assistant, Department of Statistics, UC Davis.

- STA 13 (Elementary Statistics)

- STA 108 (Regression Analysis)

- STA 145 (Bayesian Statistical Inference)

- STA 231A (Mathematical Statistics- PhD level coursework)

- STA 106 (Analysis of Variance)

- STA 131AB (Introduction to Mathematical Statistics)

- STA 200B (Mathematical Statistics) - Masters level coursework

Mentoring, Department of Statistics, UC Davis.

- Undergraduate thesis: *Functional data analysis on the remaining life expectancy of the older population over the years.*
  Advised by: Dr. Hans-Georg Müller on (2022).

- Undergraduate thesis: *Inference on the dynamics of COVID-19 in India for the state of Kerala.*
  Advised by: Dr. Debashis Paul (2020-–2021).

3   Recognition

- Excellence in Graduate Student Teaching Service Award, Department of Statistics, UC Davis (2022)-
  Recognition for overall excellence in teaching throughout graduate career.

- Teaching Recognition Award, Department of Statistics, UC Davis (2019, 2021)-
  Excellence in graduate student teaching, either as a TA or AI.

- Alan Fenech Award for Outstanding Student Service, Department of Statistics, UC Davis (2020)-
  Given to graduate students for their outstanding service to the department.

4 Teaching methods

I believe teaching requires empathy and finding common ground between concepts and students' prior knowledge. I approach lessons by putting myself in the beginner's shoes and using real-life examples to motivate each step of the learning process. For instance, in an introductory statistics course, rather than giving a statistical model for regression straightaway, I make an effort to motivate each component step by step- how a predictor, say daily temperature could influence a response, say rainfall, what would be the easiest way to express this relationship, connecting the dots to visual geometry- if the relationship is linear, what parameters do we need to know, and finally from a given dataset, how do we compute the values of such parameters. Taking this inquiry-based path gives students the opportunity to feel the mechanics and motivation behind a formula before ever dealing with cumbersome calculations.

While teaching mathematical statistics, it is always important to develop the intuition behind the theory and illustrate how the theory can be used to tackle problems in multiple disciplines such as biological sciences, and computer sciences among others. Taking a step back and looking at the bigger picture of what we want to learn is important. This approach also fosters logical thinking and confidence in confronting unfamiliar but similar concepts. In terms of curriculum design, this strategy allows me to move freely through the topics covered in a class. For example, after introducing summary statistics in an intro class, I can jump right into linear regression, emphasizing interpretation and applications to scientific or economic questions. Teaching regression at the beginning of the quarter allows students to see the power and usefulness of just a few salient statistical concepts and typically stokes interest in the other course content to come.

I encourage interruptions and requests for clarification in class, as they help to identify gaps in understanding. I build students' confidence in their existing knowledge before asking probing questions to guide them toward reaching a conclusion themselves. This builds intuition, curiosity, and engagement in the lessons.

I learn and grow alongside my students both in and outside the classroom by being sincere and authentic. I believe effective teaching involves continuous learning and listening to students' alternative perspectives. While my instinctive thought process may work for one type of thinker, others may need an entirely different kind of line of reasoning without these conversations with students, my "teaching toolbox" would certainly have fewer instruments to pull from. I also find value in relating to teachers of entirely distinct topics. By talking to friends who teach seemingly very different subjects, like dance or yoga, I have gained valuable insights into new teaching techniques. For example, a dancer breaks choreography into smaller steps just in the way that a statistics student might dissect a formula into its separate components.

I believe in using various teaching methods to encourage active learning and make classes enjoyable. In-class discussions, group projects, and student presentations are effective ways to engage students. In upper-level courses, I encourage reasoning through abstraction and rediscovering concepts together. I prioritize asking "why" over memorizing "what" and strive to nurture students'

inquisitive nature. Technology can also be a useful tool for connecting with and engaging students.

I plan to evaluate students in my course by considering different activities such as group discussions, research projects, and assignments in addition to exams. My goal is to foster critical thinking and enhance problem-solving skills, which will be reflected in both exams and assignments. I will use a mix of multiple-choice and elaborate questions in exams to follow the thought processes of the students. Grading will be based on established criteria to ensure fair evaluation of understanding.

5   Inclusive classroom environment

As both an instructor and TA, I actively promote diversity in the classroom through regulated peer discussions and individual support. Using online platforms like Canvas and Piazza, students with diverse backgrounds learn from each other and engage in healthy collaborations. I have worked with students of different ethnicities and disciplines, finding these experiences enriching. A student from an ethnic minority struggled initially but with individual support and guidance, I watched her academic growth and felt a sense of accomplishment when she landed a top-notch Statistical Analyst job after graduation.

I mentored undergraduate students for their theses on COVID-19 dynamics and functional data analysis, with some continuing to graduate school. As a mentor, I trained them in research concepts, programming, and data analysis skills, and supported their graduate school applications.

I appreciate the importance and challenges of working in pluralistic organizations, thanks to my upbringing in a multicultural society and studying abroad in the United States. In 2019-2020, I co-organized a student-run seminar with two peers to provide outreach opportunities for graduate and undergraduate students. These efforts earned me the Teaching Recognition Awards in 2019 and 2021 and the Alan Fenech Award for Outstanding Student Service in 2020. I have also been the student representative for the Department of Statistics' Educational Policy and Curriculum Committee at UC Davis from 2020 to 2022.

Teaching allows me to connect with young minds and introduce them to Statistics. Seeing students understand difficult concepts is the most rewarding experience, motivating me to improve as a teacher and as a person.

6   Some encouraging comments from the students

- "I loved the stat modeling portion of the class at the end. The professor was extremely polite and encouraging to students." *(STA 418, Spring 2023, Penn State - Instructor)*

- "Having the notes on Canvas helped so I can just pay attention in class as opposed to worrying about writing everything down." *(STA 418, Spring 2023, Penn State - Instructor)*

- "Course content was very good and very well structured. Instructor was very helpful and really helped me improve during the course." *(STA 418, Spring 2023, Penn State - Instructor)*

- "Showed enthusiasm during lecture. Made coming to class enjoyable." *(STA 418, Spring 2023, Penn State - Instructor)*

- "Having one homework a week is my preferred way of learning in a university setting. Courses which slam you with multiple assignments per week tend to take more of my time while teaching me less. It was very apparent that Professor Bhattacharjee was concerned first with whether or not we were learning the content, rather than slamming us with assignments. She gave us knowledge checks about once a week which were low stakes, low pressure, and mostly served as a useful diagnostic for us to know how we are doing and what we need to work on. Great Professor. " *(STA 418, Spring 2023, Penn State - Instructor)*

- "Bhattacharjee was very enthusiastic and helpful during this course. She explained each topic thoroughly and had many opportunities for additional office hours. I enjoyed this course and would take a class of hers again!" *(STA 106, Fall 2019- Associate Instructor)*

- "Satarupa is extremely knowledgeable with the material. Additionally, she was responsive to questions outside of office hours (via email, etc.) and this was very helpful to me. I appreciate the time and effort Satarupa put towards helping me and she definitely contributed to a better understanding of the material in the class for me. She is a great TA!"*(STA 231A, Fall 2018 - Teaching Assistant)*

- "She is an intelligent and friendly person. There are always a big smile on her face. She helps us with our homework problems in the office hours and helps us to understand the importance concepts in the course materials. Thank you so much!" *(STA131B, Summer Session - TA)*

- "Satarupa is an outstanding TA. She continuously went above and beyond to explain subject material, and would stay past her office hours to assist students. Satarupa truly indicated her passion for the subject and students. Her teaching and explanation of subject content was phenomenal. Also she was always prepared, encouraging, and very kind to speak to! One of the BEST TA's I ever had. Without her guidance I would not have been successful in the course. Thank You Satarupa!!" *(STA 106, Winter 2019 - TA)*

- "Excellent TA. I learned probably 80% of what I took away in this class by going to office hours and discussions. She organizes everything very clearly and provides excellent explanations to everything. I could not be more thankful for the help Satarupa provided in me passing this class." *(STA 131B, Winter 2021- TA)*

- "You have been my lifesaver in this class! I honestly don't think I could've passed without you. Thank you for being so patient and kind during your office hours and discussions. You always make sure our questions are answered even if it means that you'll go over time. I also appreciate the attention you give to your students because the interactive aspect of your teaching definitely helps us learn the material. Once again thank you so much and thank you for being such a great TA for this course" *(STA 131B, Winter 2021- TA)*

- "Satarupa has been one of the strongest instructors I have had in the Statistics department. She really ensures that a lot of her students understand the content through active participation in lectures and during office hours (she was also my TA for STA 131B Winter Quarter 2021, so it's no surprise that her quality of teaching is still really strong)" *(STA 131C, Fall 2021- Associate Instructor)*

- "Satarupa is very passionate about what she teaches. She always does above and beyond to see her students successful, not only for her class but to see us successfully continue higher education in Stats or even career in Stats. I have much appreciation and admiration for her endless efforts, encouragement, and support. I wish her all the very best of luck in her life." *(STA 131C, Fall 2021- Associate Instructor)*