# Shaocong Ma | Teaching Statement

385-439-4778 • scma0908@umd.edu • mshaocong.github.io

I firmly believe that teaching is not simply about imparting knowledge but also about fostering an environment where every student feels valued and empowered to contribute, regardless of background. This philosophy has guided my three years as a teaching assistant, during which I have developed my teaching skills and interests. I consistently draw on real-world examples to make complex concepts more accessible and engaging, with the goal of fostering curiosity and confidence in a diverse classroom.

## Teaching Experiences

During my time as a teaching assistant at UC Santa Barbara and the University of Utah, I have had the privilege of contributing to the instruction of a wide range of courses. My experience spans from teaching lower-level statistical courses, teaching higher-level courses, and preparing course materials.

- **Teaching Lower-Level Statistical Courses**. At UC Santa Barbara, I taught sections in introductory statistical courses, including *PSTAT 5A: Statistics*, *PSTAT 5LS: Statistics for Life Science*, and *PSTAT 109: Statistics for Economics*.These classes typically drew students from a wide range of departments, and I noticed that many first-year undergraduates struggled with fundamental probability concepts. To address this, I began each section by briefly reviewing the core material from lecture, ensuring that all students, regardless of prior preparation, were on solid ground before moving to more advanced topics.

  I carried this approach into my weekly office hours as well. When students sought help with a specific exercise, I consistently returned to the underlying concepts, clarifying definitions and resolving common misunderstandings before tackling the problem at hand. In doing so, I aimed to create an inclusive and supportive learning environment where students felt both confident and encouraged to engage deeply with statistical ideas.

- **Teaching Higher-Level Courses**. In advanced courses such as *PSTAT 172A: Actuarial Statistics*, *PSTAT 175: Survival Analysis*, and *ECE 3500: Fundamentals of Signals and Systems*, my role as a teaching assistant shifted from reinforcing basic statistical concepts to providing deeper insights and supplemental material beyond the standard lecture. For example, in PSTAT 175 I conducted labs demonstrating the use of R packages for complex survival data analysis, while in PSTAT 172A I provided step-by-step solutions to exercises requiring advanced actuarial methods and pricing techniques.

  Teaching higher-level courses also made office hours more challenging and rewarding. Many students had already developed solid statistical foundations, and their questions often touched on sophisticated or research-oriented topics. In these situations, my strategy was to collaborate with students in a problem-solving process: encouraging them to explore creative approaches, analyzing the strengths and limitations of different methods together, and guiding them toward rigorous solutions.

- **Co-Teaching Experiences.** During my postdoctoral tenure at the University of Maryland, College Park, I significantly enriched my pedagogical experience by co-teaching the undergraduate course *CMSC422: Introduction to Machine Learning* with Professor Heng Huang. In this role, I was entrusted with the responsibility of designing and delivering a specialized lecture sub-series on the topic of optimization specifically tailored for undergraduate students with a limited prior. I carefully curated the curriculum to introduce key components using real-world and interactive examples, including the adversarial attacking and the step-by-step calculation of memory-efficient zeroth-order optimization technique. This experience not only enhanced my ability to structure complex knowledge systematically but also allowed me to cultivate an engaging learning environment. By bridging the gap between abstract theory and practical understanding, I successfully guided novice learners in building a robust foundation, preparing them for more advanced studies in artificial intelligence.

- **Preparing Course Materials**. These experiences were invaluable in strengthening my ability to design tailored educational resources. I prioritized clear explanations and hands-on examples to ensure that students not only

understood complex concepts but also developed the confidence to apply them. Preparing course materials has become a vital part of my teaching approach: I strive to break down challenging ideas into manageable components, provide relevant examples and visualizations, and supply sufficient background context to support student learning.

The positive feedback I have received from students has been deeply encouraging. For instance, in 2022 I received an appreciative email from a masters student in Actuarial Science at the University of Southampton. He shared that my online notes on Statistics and Actuarial Statistics significantly enhanced his understanding of complex topics such as survival models, life tables, and annuities. He described the clarity and depth of the notes as a "life saver", underscoring the broader impact well-prepared teaching materials can have, even beyond the classroom.

## Teaching Philosophy

My teaching philosophy centers on creating an inclusive, communicative, and accessible learning environment. I view effective teaching as more than delivering content; it involves nurturing a space where students feel comfortable exploring, questioning, and engaging with both the material and each other, regardless of their diverse backgrounds and learning styles.

- **Encouraging Inquiry**. I emphasize building a classroom culture where questions are welcomed and valued. Even during pop quizzes, I allowed students to ask questions, not to provide them with immediate answers, but to revisit foundational definitions and guide them toward discovering solutions themselves. This approach not only aids in clarifying doubts but also fosters a learning environment where students feel the necessity and urgency of asking.

- **Promoting Communication**. My classrooms often include students from many countries, speaking a variety of languages. To foster inclusivity and prepare students for diverse academic and professional settings, I consistently encourage communication in English. I apply this practice even in office hours with Mandarin-speaking students, drawing on my own experience as a non-native English speaker who once struggled with language anxiety. By maintaining a common medium of communication, I aim to create a supportive environment while building students confidence in expressing themselves across cultures.

- **Improving Accessibility**. Ensuring equal access to resources is central to my teaching. I make all course materials, lecture notes, slides, and lab codes, readily available on GauchoSpace, UC Santa Barbaras learning management system. This practice provides every student with the opportunity to succeed, regardless of their personal circumstances, and supports equity in the classroom.

- **Guided Lab Instruction**. In lab sessions, I proactively prepare detailed, step-by-step instructions, ensuring that every student, regardless of their prior experience or learning style, can successfully engage with and complete their experiments. Walking around the room and offering personalized guidance while students engage with lab tasks ensures that each student is fully supported and can complete their experiments. This hands-on approach helps break down complex tasks into manageable steps. It creates an inclusive and supportive environment where students feel empowered to participate and succeed.

## Teaching Plans

I am eager to teach courses in statistical learning, machine learning, reinforcement learning, optimization theory, and theoretical computer science. At the undergraduate level, I am comfortable teaching introduction to general machine learning, algorithms, and introductory courses providing mathematical foundations for statistics and computer science such as probability, topology, and discrete mathematics. At the graduate level, I am comfortable teaching advanced machine learning, statistical and computational learning theory, algorithmic game theory, and randomized algorithms. Beyond the basic courses, I am interested in developing and teaching an advanced course on the intersection of optimization theory and the large language model fine-tuning techniques, as they are a perfect fit for my academic background. Teaching has been both an important and deeply rewarding aspect of my academic career, and I look forward to continuing this work as a faculty member.