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Teaching Statement

I have a deep interest in **undergraduate education** and **pedagogy**, with a focus on practical skills such as **programming and data analysis** that are invaluable but not often taught as part of a traditional science curriculum. As coding is a central component of quantitative research today, I feel strongly about providing students from all backgrounds with the necessary programming experience and skills they need to achieve their goals.

My teaching philosophy is comprised of three central tenets:

1. **Conceptual Mastery**: Students should gain a strong understanding of the underlying themes and concepts of the course. This enables students to build intuition as well as transfer skills and knowledge gained from the course to other areas over a long time period.
2. **Experiential Learning**: The most effective ways to learn always involve "hands-on" experience. Students should have a variety of opportunities to directly apply the material and skills they are learning to relevant and informative problems and discuss these experiences with their peers.
3. **Accessibility, Equity, and Inclusion**: Students should have the ability to access, pursue, and learn from these opportunities regardless of their background. The course should be structured so that students feel their unique backgrounds and identities strengthen, rather than weaken, their connection to the material. The instructor must ensure all students can work in a supportive classroom environment, can engage with the material and the instructor at multiple levels, and have access to the resources they need to succeed.

To accomplish these goals, I focus on teaching methods that foster **student engagement** with material using a "flipped classroom" setting focused on discussing and completing **interactive exercises** with peers. This presents a valuable framework for building frequent and "low-risk" student engagement, encouraging students to ask questions and helping to remove any possible barriers for seeking help. Frequent discussion also gives valuable opportunities for **peer collaboration**, which has been shown to be one of the most effective methods to learn new material. This setting also provides students with the flexibility to engage with the material at different speeds and in different ways, reducing classroom stress and improving their ability to engage with the material throughout the course.

I also contribute directly to **pedagogy-oriented texts**, **open-source software packages**, and **online resources**. These provide alternative ways to engage with students, educators, and researchers at all levels, and help to directly build intuition around and encourage the use of responsible data analysis practices in scientific research. I aim to continue developing and improving statistical software to enable science across disciplines and increase scientific impacts beyond the confines of the classroom.

Past Experience

During my graduate studies at Harvard from Fall 2016 to Spring 2020, I took an active leadership role in undergraduate education following these strategies. I was a Teaching Fellow (TF) for five courses during this time, including introductory and advanced undergraduate courses for astronomy majors as well as general education courses for non-majors. As part of these courses, I have gained experience leading "flipped classroom" exercises, facilitating discussions on the intersection of science, society, and social inequities, developing interactive programming exercises and data analysis workshops, helping to mentor and supervise independent student projects, and working with online tools to facilitate remote instruction.

Students have responded very positively to my teaching: **I have received Q-scores above 4.7 (out of 5) for all these courses**.[1] My efforts have also been recognized by Harvard University with **3 Certificates of Distinction in Teaching** from the Bok Center as well as a **Teaching Award** from the Department of Astronomy.

In addition to work inside the classroom, **I have also taught programming and statistics to undergraduates from underrepresented minorities (URMs) as part of the Banneker Institute** over Summer 2017, 2018, and 2019. As part of this work, I developed a two-week intensive curriculum, designed interactive coding exercises, and (co-)led classrooms to help give students the confidence and tools they need to tackle programming in their own research. This work has given me the opportunity to be involved with efforts to improve access and outcomes for students from all backgrounds. I aim to continue involvement in similar initiatives in the future.

[1] Individual reviews for TFs were not collected in Spring 2020 due to the abrupt transition to remote instruction.

Courses

Harvard: Teaching Fellow

ASTRON 22: The Unity of Science: From the Big Bang to the Brontosaurus and Beyond	*Spring 2020*
ASTRON 191: Astrophysics Laboratory	*Spring 2019*
ASTRON 17: Galactic and Extragalactic Astronomy	*Fall 2018*
ASTRON 130: Cosmology	*Spring 2018*
ASTRON 16: Stellar and Planetary Astronomy	*Spring 2017*

Banneker Institute (Harvard): Course Instructor

Introduction to Programming in Python	*Summer 2017, 18, 19*