Hari Raval

Dear IACS Student Scholarship Committee,

I am interested in being considered for the IACS Student Scholarship to acquire funding for my research project, "One-Shot Transfer Learning of Non-linear Ordinary and Partial Differential Equations". This funding will play a pivotal role in contributing to my tuition while I work on my thesis and will enable me to prioritize fulfilling the research goals I have set for myself and upholding my duties as a TF for an IACS course. By being awarded this funding, I can avoid having to worry about finding a second job to cover outstanding tuition costs, and this time can be further invested in taking one or two technical courses that can complement my research interests and satisfy my intellectual curiosity. I believe that I am an excellent candidate for the grant on account of my academic standing during my first year, the strength of my research proposal, and insight I have gained through Harvard courses during my first year.

I would like to highlight a few specific examples of my learnings from this academic year and how they have enabled my proposed research project. First, my work during AC 207 "Systems Development for Computational Science" in the Fall proved pivotal in providing me with the foundational programming tools to write and structure efficient, clear, and well-documented code. These skills are important not only for executing upon the technical tasks of year-long thesis, but more generally applicable to any computational projects in industry. Additionally, AM 205 "Advanced Scientific Computing: Numerical Methods" in the Fall was particularly valuable because it provided me with the mathematical underpinnings necessary to understand traditional numerical methods to solve ordinary and partial differential equations. Understanding these numerical methods and approaches is essential for my research project as I can then improve upon them in my neural network work to solve such equations. Finally, AC 209A "Data Science 1" and CS 109B "Data Science 2" in the Fall and Spring, respectively, were crucial in providing me with the necessary skillset to work on a rigorous thesis pertaining to data science. Learning about *how* and *why* various machine learning models work puts me in a position to solve many different data science problems. Notably, learning about neural networks and how to apply them with the TensorFlow library enables me to build upon these concepts in my thesis to effectively solve ordinary and partial differential equations and expand my toolkit to even more powerful libraries like PyTorch.

I would be happy to answer any further questions regarding my candidacy for this scholarship. Thank you for your consideration!

Sincerely,
Hari Raval