Ian Lipkin ‘74 Science Prize: Project Proposal

Zaria Katz

I plan to use the Ian Lipkin ‘74 Science Prize to conduct a bioinformatics research project during the summer ‘24 under the guidance and mentorship of former mathematics professor at Sarah Lawrence College, Ross Parker.

As a junior who is pursuing the Columbia University 3-2 Engineering program for biomedical engineering, this project aligns greatly with my educational and career goals. Ross and I share an interest in data analysis in healthcare, and I am particularly fascinated by endocrine disorders, such as type 1 and 2 diabetes.

Ross and I have been developing a project which focuses on machine learning programming techniques and their application to diabetic research. Over the summer, we plan to develop a machine learning program capable of analyzing fundoscopic images of diabetic retinopathy, a condition that manifests in discoloration of the retina, which can cause blindness for diabetics. We have obtained a dataset which contains 106 fundoscopic images of retinas with diabetic retinopathy, which our machine learning program would analyze to learn to diagnose the presence of diabetic retinopathy in other fundoscopic images of retinas.

The Ian Lipkin ‘74 Science Prize will be used to fund the educational and technological resources necessary for conducting this project. It will also provide me with the opportunity to attend two bioinformatics conferences in New York City to enrich my understanding of bioinformatics, and allow me to see the current applications of the programming techniques I will be learning.

Ultimately, I aim to gain knowledge and skills pertaining to machine learning and programming in medicine, and I am grateful for the incredible opportunity to expand my knowledge in bioinformatics while pursuing research in a field I am deeply passionate about.