Nikita Agrawal

The Exelon Foundation STEM Academy has been a transformative experience, shaping both my skills and perspective in profound ways. Through the academy, I honed crucial leadership, communication, and presentation skills, which have proven invaluable in various aspects of my personal and professional growth. One of the defining moments during the academy was the opportunity to work collaboratively with a team of talented women on a business idea aimed at contributing positively to the environment. This hands-on experience not only allowed me to apply theoretical knowledge but also provided insights into the practical aspects of developing sustainable solutions. The Academy also played a pivotal role in solidifying my interest in sustainable energy. Learning about the transition from centralized to distributed sources of electricity generation provided a broader perspective on the challenges and opportunities in the field. This knowledge has not only informed my educational journey but has also influenced my career aspirations. As an Exelon STEM Ambassador for the second year, I have extended the impact of my experience by inspiring young girls through STEM-focused hands-on workshops. Partnering with organizations such as the Society of Women Engineers Next and Green Team, I've been actively involved in promoting clean energy, environmental sustainability, and STEM education among middle and high school students. This commitment reflects my dedication to bridging the gender gap in STEM fields and fostering a passion for sustainability.

I spent my 2022 summer with Dad in Oregon, where wildfires raged across the state. Armed with my prior experience in artificial intelligence, I decided to research predicting this natural disaster. I learned that current wildfire predictive models were region-based and computationally intensive. Therefore, I aimed to accurately predict large wildfires across the United States using a scalable model, leveraging easily available environmental and atmospheric data. I developed six machine learning classification models, and performed model validation tests and variable importance analysis to identify important variables. I found that the Extreme Gradient Boosting (XGBoost) Classification model performed the best in predicting large wildfires with a 90.44% accuracy. Furthermore, towards environmental justice, I performed a spatial analysis to identify disadvantaged communities that are also vulnerable to wildfires. For my research, I gained recognition at international science competitions, conferences, and received media attention. At the Illinois Junior Academy Science Fair, I won the 1st place award in the earth science category.

I advanced to compete with 1600 select high-school students worldwide at the prestigious Regeneron International Science and Engineering Fair (ISEF), where my research won the 3rd Place Grand Award in my category plus three Special Awards, including one from the National Geographic Society - given at ISEF to only five students overall. I presented my research at the International Conference on Sustainable Development in September 2023 and at the American Geophysical Union Conference in San Francisco in December 2023.

Looking forward, I plan to continue my education in STEM, leveraging the foundational skills and knowledge gained from the academy. The experience has sparked in me a specific interest in using technology to address environmental challenges.