



Colorado Science and Engineering Fair

2025 Individual Project Abstract Form

Please print 2 copies of the completed form. Sign both copies, keep 1 for your notebook and submit 1 copy to your Regional Fair Director with your other paperwork.

Title of Project: Optimization of Non-Invasive Pneumonia Prediction Using Novel Machine Learning Algorithms

Finalist's Name: Aishwarya Kamineni

School and City: Grandview High School

Sponsor's Name: Rama Avirneni

Category: Mathematics & Computer Sciences

Division: Senior (grades 9 - 12)

Abstract (250 words or less):

Pneumonia is an infection that inflames air sacs within the lungs, which are usually filled with fluid or pus. Pneumonia is spread by airborne droplets, meaning the 3 million US citizens who contract it each year receive it from coughs or sneezes, creating a potentially life-threatening situation for the patient from mundane interactions. Various factors such as symptoms, age, and preexisting health conditions can heighten the urgency of medical imaging, which is required to confirm pneumonia. Currently, the most accurate machine learning algorithms that detect pneumonia through invasive methods lie at approximately 90%. In my project, I aim to increase the accuracy and detailedness of pneumonia prediction so the patient may have the most accurate diagnosis within minutes, rather than days or weeks. My project uses a novel machine learning algorithm to generate the likelihood of pneumonia, and type of pneumonia for the patient based on biomarkers, laboratory parameters, physical features, and other symptoms to bring the best care most efficiently to the patient.

I hereby certify that the above statements are correct and the information provided in the Abstract is the result of one year's research. I also attest that the above properly reflects my own work.

Finalist's Signature:

Date:

In addition, all students must complete the ISEF Student Checklist (1A), Research Plan, Approval Form (1B), and Checklist for Adult Sponsor (1), and any other ISEF forms required for this type of project. See the International Rules and Guidelines for form requirements. Return COPIES of all of these forms to your Regional Fair Director with you Finalist Verification/Permission Form. **A signed copy of this form must be included in your notebook.**