BIOE486 Team 21

SARS-CoV-2, which presents in humans as COVID-19, has taken the world by storm for the past year. Testing has been a crucial tool in the fight against COVID-19, as asymptomatic individuals can still be contagious for up to two weeks. As more of the global population becomes vaccinated, testing may diminish, but accurate, affordable, and accessible diagnostic tests will still be important in light of global vaccine shortages, anti-vaxxer movements, possible infection of vaccinated persons, and new emerging strains of the virus. Previous research has shown the utility in designing diagnostic systems using machine learning models, as they have the ability to pick up on multiple pieces of patient information to produce an accurate diagnosis. The usage of supervised and/or unsupervised learning models has the ability to improve medical care and decrease cost. Considering the urgency of this pandemic, Beckman Coulter proposed the assessment of hematological parameters from their DxH 900 analyzer in order to develop a machine learning algorithm to aid in rapid and accurate diagnosis of COVID-19. As such, we developed a machine learning platform to diagnose COVID-19. Our test takes a 165 µL blood sample, processes it in 10 minutes, and provides a binary yes/no diagnosis with a 97.5% balanced accuracy, a 2.95% false positive rate, and a 16.07% false negative rate. These results are comparable to existing antigen and RT-PCR tests, and the rapidity and accessibility of our test makes it a viable market alternative.