

Thesis Project Portfolio

Designing a Wearable Air Filtration Device to Block Coronavirus Transmission

(Technical Report)

Misattribution of Scientific Expertise during COVID-19

(STS Research Paper)

An Undergraduate Thesis

Presented to the Faculty of the School of Engineering and Applied Science

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In Fulfillment of the Requirements for the Degree

Bachelor of Science, School of Engineering

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Sociotechnical Synthesis

The COVID-19 pandemic has been unprecedented in terms of the impacts it has had on the world. To date, there have been millions of cases and deaths throughout the world due to COVID-19. It has affected, in one way or another, all aspects of our lives due to the potentially devastating consequences of the virus. Scientists, and leaders, such as politicians, have played an important role in providing important guidance for citizens during this time of great uncertainty. In addition, science has been crucial with regards to learning about this virus and helping to formulate numerous solutions to mitigate COVID-19. Its expertise will continue to be required as COVID-19 remains a significant threat in 2021.

The technical component involves designing a wearable air filtration device to block coronavirus transmission. Even though current face masks, such as cloth and N95 masks, have been utilized to mitigate the spread of COVID-19, they have several limitations, such as poor filtration and poor comfortability. Therefore, through our capstone project, my group designed a device that overcomes the limitations of face masks used today by providing superior filtration to block COVID-19 and comfortability.

My STS research explored the issue of the misattribution of scientific expertise during the COVID-19 pandemic. I set out to determine how science cannot actually solve societal problems. This is due to politicization in the field of science causing different beliefs surrounding a problem. As an example of this phenomenon, I explored the topic of COVID-19 herd immunity and the controversies that have arisen regarding the issue. Then, I attempted to illustrate how social media companies, such as Twitter, have worked to reduce the misattribution of scientific expertise with regards to COVID-19. Through my research, I suggest how science,

as an institution, could adapt certain methods that social media companies, such as Twitter, use in order to address the issue of misattribution of scientific expertise.

The technical project was a success. My group was able to achieve our overarching goal of designing a wearable air filtration device to block coronavirus transmission. In order to make the device accessible, we decided to distribute the design of our device through a Reddit channel so that other people could construct their own device and protect themselves from COVID-19. My group believes that the device design could be improved through the use of 3D printing in order to create a more polished design.

My STS research paper was also a success. I was able to explore the issue of misattribution of scientific expertise and determine some methods to mitigate it. I think that the research could be improved by investigating other case studies of the issue so that better solutions can be formulated to reduce misattribution of scientific expertise.

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