

[COVID Information Commons \(CIC\) Research Lightning Talk](#)



Transcript of a Presentation by Sara Rampazzi (University of Michigan), October 2020

Title: [COVID19: Science of using wirelessly powered sensors to quickly scale up verifiable decontamination of individual N95 respirator masks](#)

NSF Award #: [2031077](#)

[Youtube Recording with Slides](#)

[October 2020 CIC Webinar Information](#)

Transcript Editor: Saanya Subasinghe

Transcript

Sara Rampazzi:

Slide 1

So I'm Sara Rampazzi and I'm working for the University of Michigan but I am also a professor of University of Florida. And this is the RAPID Science of using wireless technology for quickly verifiable decontamination procedure for I-95 masks. This is a joint effort between me and Professor Kevin Fu as part of the consortium and N95DECOM.

Slide 2

So, as you can see, in the past month, we face a severe shortage of PPE and mask. And healthcare workers were forced to use these masks when treated COVID patients. And all around the world we see this shortage.

Slide 3

So the CDC has developed different crisis strategies for dealing with the shortage and one of them was implemented limited reuse of N-95 masks after verifiable decontamination procedures. So our research project aimed to protect these frontline healthcare workers by lowering the risk of infection from reuse N-95 mask.

Slide 4

So we develop reliable wireless sensor technology and procedures for each base decontamination process. It is easily deployable, low power, low cost, scalable, and secure to be used in healthcare facilities around the world under resources and under N-95 mask shortage. But why [is] decontaminate this mask so hard?

Slide 5

Because it has the word say - disposable masks are not designed to be used multiple times. So you don't have only to ensure how - the wait coronavirus [de]activation, but you have also to avoid degradation of the filtration performance and also degradation of the mask sealing and fitting for the wear. And also avoid cross contamination of other pathogens like bacterium, for example.

Slide 6

So the CDC has identified the moist heat as one of the most easy deploy - deployment and most cheaper techniques for the decontamination. Why does this happen? Because the temperature and humidity [inaudible] are required for this.

Slide 7

The contamination is suitable for heating devices already present in hospitals. So this cheap technique can be used also to be able to use this mask up to five times. So how our project is tackling the challenges to have widely deployed this [technique] in hospital, for example, where the lack of standard procedure of this type of decontamination or the lack of specialized equipment, for example, commercially, heating device can have humidity and not uniform leakage. And each mask requires stable decontamination condition. So it's essential that you constantly monitoring heat and humidity level for each mask. So, the current results that we have, we develop our first prototype-

Slide 8

But it is this platform that can be used for monitoring heat - the temperature and humidity level of each mask and it is a wireless system with multiple sensor nodes, one for each mask, with a high temperature resistance sensor and with limited energy consumption. This is a cheap and [inaudible] consumer device technology that can be implemented on combating heating systems. And everything is monitored by a smartphone app for automated control. And also you can raise an alarm for like, [making] aware the nurse, in case of a change of environmental condition. So this is the team that is, like during this month, is working on a joint effort between the University of Michigan or the University of Florida, Northwestern University.

Slide 9

So we are working to optimize this system, for example, adding energy investing on RFID technology to be able to monitor the things and lowering the power consumption. And our goal is deployment and testing in the clinical settings and also integrating this system in, like, a common operating procedure in hospitals. And then we will global disseminate the results. We identified DECOM consortium. So, thank you for the attention.

Slide 10

This is my email [srampazzi@ufl.edu] so you can reach me for the other information. And this is the website [<https://spqrlab1.github.io/N95deconProject>] so you can see all the updates on the - on the project and visit the N-95 home for other mask decontamination information. Thank you!