# No-Hands Health Helper

**Laura Silverman, Rachel Kristian, Angeliki Dimopulos, Katie Cyster**
Department of Electrical & Computer Engineering
Lawrence Technological University
Southfield, MI 48075, USA
lsilverma@ltu.edu, rkristian@ltu.edu, adimopulo@ltu.edu, kcyster@ltu.edu

**George Pappas, Ph.D.**
Department of Electrical and Computer Engineering
Embedded Software Engineering
Lawrence Technological University
Southfield, MI 48075, USA
gpappas@ltu.edu

## Abstract

The No-Hands Health Helper aims to provide a more efficient way to go through the COVID-19 screening process as well as to help prevent the spread of it. The system contains two main components. The first component is a questionnaire that is filled out through your computer to ensure the user completes it at home. Failure to pass the questionnaire will have the user's results sent via email to HR and the user telling them not to come in. Passing the questionnaire will result in two emails. One email contains a copy of the questionnaire results and the other a QR code that will allow the user to utilize the screening component of our system. The second component of the system is a physical device the user interfaces with, at the office, prior to entering the building. A passive infrared sensor (PIR) is used to initiate the physical part of the screening process. Once the PIR sensor detects motion, a screen that is mounted to the top of the system and encased in a 3D printed box will prompt the user to scan the QR code. Once the second device is activated, the system will verify that the QR code has not been used yet and meets the other requirements through use of the SQL database. The requirements are current date, time span of two hours, and user's name is not duplicated. If the QR code has already been used, the system will not continue, otherwise the QR code will be saved and the second part of the system will continue. The system will take the user's temperature through a thermal camera. If the user passes the standards set, the system will dispense hand sanitizer through the use of an optical sensor, relay, and mini submersible pump. The hand sanitizer is dispensed for as long as the optical sensor detects the object. The system will also provide a mask using a micro servo motor and a 3D printed rack and pinion. Our components are controlled by a raspberry pi and an Arduino. The entire system is powered by the DC power source provided by an outlet and is fed into two buck converters, which regulate voltage, and is distributed by our printed circuit board (PCB). The system is enclosed in a plywood box with various holes for the components. It is lightweight and therefore easily portable. This design helps make the screening process more efficient while helping stop the spread of the virus.

## Keywords
No-Hands, questionnaire, dispenser, sensor, QR code

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## Biography

**Laura Silverman** is an undergraduate student attending Lawrence Technological University. She is working towards her bachelor's degree in computer and electrical engineering along with a business administration minor, and plans on graduating in the year 2022. She is just gettingstarted into research and this is the first research project she has done.

**Rachel Kristian** is an undergraduate student attending Lawrence Technological University. She is working towards her bachelor's degree in computer and electrical engineering along with a mathematics minor, and plans on graduating in the year 2022. She is just getting started into research and this is the first research project she has done.

**Angeliki Dimopulos** is a recent graduate from Lawrence Technological University. She is receivedher bachelor's degree in electrical engineering, and is starting her career at ITC Holdings. She is just gettingstarted into research and this is the first research project she has done.

**Katie Cyster** is a recent graduate from Lawrence Technological University. She is receivedher bachelor's degree in electrical engineering, and is starting her career at General Motors. She is just gettingstarted into research and this is the first research project she has done.

**Dr. George P. Pappas** is an Assistant Professor of Electrical and Computer Engineering at Lawrence Technological University, Southfield, MI, USA. He has also taught Biomedical Engineering courses in biomedical devices and imaging processing. He has over 10 years of teaching and research experience in embedded systems. He has been the PI for a resent DENSO grant in machine vision safety system in vehicles. He is with the Electrical and Computer Engineering Department since 2016. He received his masters and Ph.D. from Oakland University, Rochester MI, USA. He has taught and mentored students in the areas of embedded systems, encryption and security, imaging processing in medical and automotive applications, microcontrollers, and High- Performance Computing systems, artificial intelligent and machine learning algorithms.