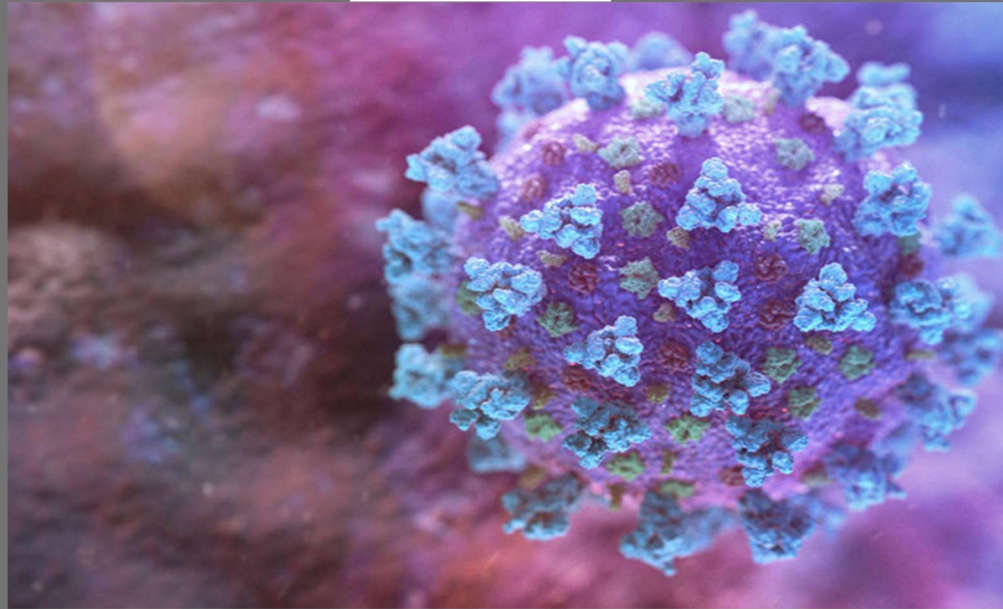


**COVID -19 : Technological Interventions by  
SVNIT Surat**



## **Message from Director**

I am happy to share with you some of the Technological Interventions undertaken by SVNIT Students and Faculty Members in Challenging times of COVID -19.

Starting from tracking the people under quarantine to provide food packets and develop 'Sardar Automated Trolley' for COVID Patinents, faculty members gainfully engaged the research scholars in fighting against the epidemic. I am very much sure that such technological interventions and its scale up are definitely going to help battle COVID-19. I hope SVNIT Surat fraternity will show great sense of responsibility and devotion in days to come and will contribute in all possible extent to the Nation for fight against the epidemic. My sincere thanks to the participating teams of SVNIT Surat for the hard work, inspite of various constraints.

SVNIT Surat

May 09, 2020

Prof S R Gandhi

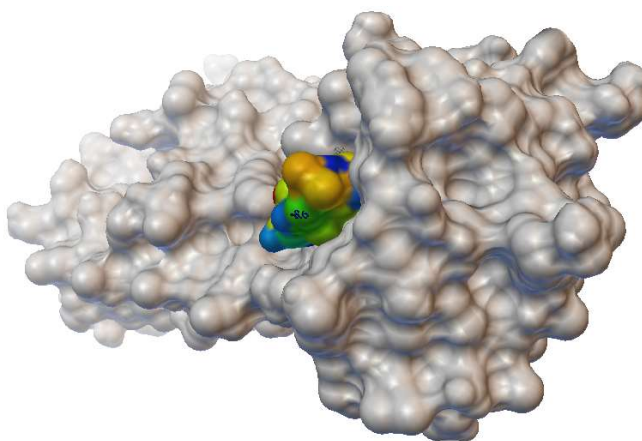
Director

## Technological Interventions in the Institute

During the challenging times of COVID -19, the Director of the Institute Dr Shailesh R Gandhi encouraged the students/ research scholars of the institute to come forward and contribute in fighting against COVID -19. Students and faculty responded to his call and contributed in various ways. The brief description of each interventions are described in following paragraphs:

**1.0 Mr Seshu Vardhan**, research scholar of **Applied Chemistry Department** under the supervision of Dr S K Sahoo started computer based simulations and docking work using high-speed computing facilities to contribute some results on the mission of quick discovery of drugs for COVID-19. The purpose of computer based simulations work is to search targets from medicinal plant extracts (found in tulsi, neem, citrus etc) and FDA-approved drugs that could have potential use for fight against COVID-19.

Some computational results from his research group indicating that the phytochemicals (chemicals of plant origin) are showing better binding with the proteins related to COVID-19 as compared to hydroxychloroquine claimed to be effective against COVID-19. Therefore, the outcome is a good sign for future research to use traditional Indian medicines an alternate for long term fight against COVID-19. Some other computational simulations to propose suitable targets for COVID-19 are in the process of development.



@ SVNIT : Image of Molecular Docking

**2.0** Considering the shortage of protective devices, Director Prof. S. R. Gandhi called upon the faculty and students to come up with some easy to use protective devices utilizing the in-house capabilities of the institute. Taking this call, **Dr. Harshit Dave**

and Dr.Shailendra Kumar from Mechanical Engineering Department came up with a simple and cheap face shield and face mask with the support of their research scholars, Ashish Prajapati, Swapnil Vyavahare, Ravi Teja Karumuri Rahul Narkhede and Labh Chand Dhakar. The 3D printer was utilized which is an upcoming manufacturing process which is being widely investigated in Advance Manufacturing Laboratory and Research Lab (Production section) of the department.



The team The team used PLA material which is a biocompatible material having negligible impact on environment. Face shield and face mask so fabricated weigh only **15 gram** and **70 gram** respectively and can be easily worn. Similarly the





team made and distributed ear guards, public toilet tap retrofit, door handle retrofit etc. Around 700 face shields have been distributed amongst front line covid warriors like Surat Municipal Health Care Team, Medical doctors, Local Police Station Staff, Security Staff, Mess Workers etc.

**3.0 Development of low cost Steriser box yoUVen for sanitization of vegetables groceries and mobile phones etc. :** One major channel, through which the virus has still been managing to spread, is vegetables, groceries and, particularly, mobile phones. Thus, it is very important to thoroughly sterilize surfaces of mobile phones, vegetables, fruits and groceries before using them. Although several new designs of sterilizer box have been emerging recently for decontamination of these surfaces, most of them rely on irradiation of UV-C on the surfaces to deactivate virus. However, the complete sterilization of entire surface may not be guaranteed by mere UV irradiance, particularly due to shadowing in case of objects with irregular shape or when the objects are in bunch, such as currency notes.

Research Scholar **Akshay Jariwala** and **Dr. Vipul Kheraj**, **Associate Professor of Department of Applied Physics, SVNIT**, and his team at Optoelectronic Materials and Devices lab has developed and fabricated a novel sterilizer box to overcome this problem. The design involves combination of UV-C radiation along with hot-air in an oven, hence named 'yoUVen', to ensure thorough sterilization of various objects, even when the surface is irregular in shape.



**@SVNIT : UV based sanitizer box for sterilization of vegetables, mobile surfaces etc**

**4.0 Development of ‘Sardar Automated Trolley’ for COVID-19 patients : Mr Parth Shah** research scholar at SVNIT Surat under the guidance of **Prof S A Channiwala, CSIR Bhatnagar Fellow** and workshop staff **Shri Gajendra Panchal** along with **Mr Gav Master and Mr Shivdas** developed an automated Trolley for COVID-19 ward. The trolley can be operated using smart phone from remote location. The trolley compartments were treated with anti bacterial and antiviral coating treated with Tulsi Extract. **Dr Ravi Kant Workshop in-Charge** extended all his support.



**-Hand over of Automated Trolley to Covid Patient Ward to  
Dr. Vandana Desai, HoD, SMC Hospital by Prof. S. Channiwala**

The trolley can be operated remotely and can be used to dispatch food packets, medicines to covid patients. It has speaker arrangement for announcement.

**5.0 Mr Kalpak Sagar and Nishant Shah, Research Scholars** under the guidance of **Dr Hemant Mehta and Shri G J Panchal** fabricated a disinfection tunnel for vehicles visiting the campus. The tunnel is also used to disinfect the ambulance on campus which is also handling the covid patients. **Shri G J Panchal, Technician SG I** and Incharge Foreman at Workshop played a key role. **Dr Ravi Kant** extended all support from Workshop as Workshop Incharge.



**Tunnel Under Construction for disinfection of Ambulance, Institute Vehicles etc at SVNIT main gate.**

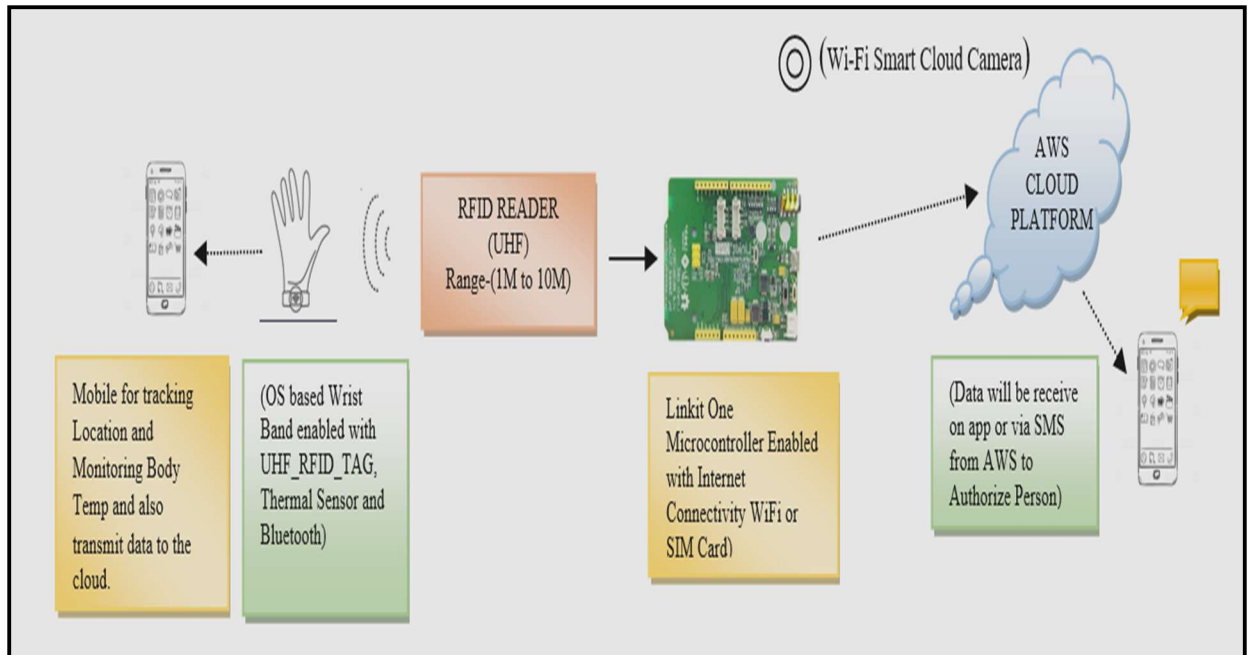
**6.0** With the lead role of Workshop Staff **Mr Gajendra Panchal** and support from research scholars Mr Puneet Kumar and Himanshu Prajapati developed a **foot operated hand sanitizer** that can be operated using foot paddle so as to minimise the risk of transmission. The machine was developed and handed over to Health Center. **Dr Ravi Kant** Professor Incharge Workshop mentored the development of this product.





**Foot Operated Sanitizer Dispenser Placed at the entrance to the Health Centre.**

**7.0 The Students of Electronics Engineering Department of SVNIT Surat Kanchankumari, Pritesh Kethele, Shubham Pandey under the guidance of Dr Mrs Upena D Dalal, designed home quarantine people tracking and alert message generation system.**



### Home Quarantine Tracking and Alert Message Generation System

The system monitors in three stages. In First stage OS based wrist band will connect through mobile phone using Bluetooth. GPS location and thermal body temperature will be monitored and data will be shared to cloud. Geo-fencing will be created using home location of quarantine people. If that person cross that geo-fencing area alert message will be sent along with exact location of that person using GPS feature and if that person tries to remove the wrist band, variation will be observed on thermal sensor data and alert will be sent to corresponding authority using cloud.

In second stage if person decided to roam around and left the mobile phone in home intentionally, then at exit points of society UHF RFID reader will detect RFID tag and data will be transmitted to cloud using LinKit One microcontroller and after that alert will be sent to concern authority using cloud.

In third stage if person intentionally removed his/her wrist band and left mobile phone in home then WiFi smart cloud camera will detect that person using face detection and if it matches true with the record of quarantine people then alert message will sent to concern authority using cloud.

**8.0** Around **22 students** under the guidance of **Dr K D Yadav, Dr Krupesh Chavhan and Mrs Dr Shweta Shah** under Unnat Bharat Abhiyan participated in following activities:

- a. Participated in Total Health by Rhythmic Breathing webinar and spreaded awareness and benefits of such exercises and Yoga
- b. Students participated in awareness photo making to fight against Corona Virus
- c. UBA students/ Faculty and our **Chief Medical Officer Dr Sanjay Shah** contributed in making 10,000 cloth masks by taking cloth in donation from one of the Surat Textile owners Shri Kamal Pugalia Ji and Dr Paresh Shah (Surgeon and Philanthropist), got them stitched from the women from villages adopted under Unnat Bharat Abhiyan. This has made women villages to earn their livelihood in challenging times. The cotton masks were distributed to campus students, security staff, mess workers, house keeping staff of campus. In addition to this few masks were distributed to village people.





**SVNIT UBA TEAM WORKING WITH VILLAGE WOMEN OF ADOPTED VILLAGES MAKING COTTON MASK DURING COVID 19**

**9.0** Webinar on 'Emotional Wellness During COVID-19' was arranged on **YOURDOST** platform for 300 students of SVNIT Surat. Students participated in overwhelmingly.

**10.0 Use of artificial intelligence** to detect covid patient : **Dr J. Banerjee** led ASHINE incubated students, namely, **Nikhil Vyas, Pratyush Gupta, Divya Shah and Kishan Singh and Het Shah** developed a software using artificial intelligence and deep learning claiming that the chest X Ray can assist doctors in identification of COVID -19.

**11.0 Making of inhouse Hand Sanitizer by Chemical Engineering Department** : The research scholars Mr Rushikesh and Mr Yash under the able guidance of **Dr Jigisha Parikh, Dr Meghal Desai and Dr S R Patel** prepared around 100 Liters of Hand Sanitizer. This then filled in small bottles and were handed over to Health Center Chief Medical Officer Dr Sanjay Shah who in turn arranged to distribute in campus at various places like students hostel, security staff, faculty quarters etc. Similarly few bottles were handed over to Dr K D Yadav of Unnat Bharat Abhiyan for its distribution in villages.





**Sanitizer Made at Chemical Engineering Department for inhouse Distribution**