

Maulana Azad National Institute of Technology, Bhopal

Sub: List of Research proposal for COVID-19.

The final list of Research projects uploaded on the website of NITSER Council for COVID-19 Research is as follows. It can be viewed on the link <http://nitcouncil.org.in/index.php/site/covid19> . All the faculty members (PI & Co PI) are requested to start the work and complete the project within the specified time period.

S. No.	Name of Faculty	Research Title	Research Description	Period
1	Dr. Pragati Agrawal, Assistant Prof., Department of CSE	Detection of fake tweets related to COVID-19	The aim of this project is to identify fake tweets using various methods. Tweets related to COVID-19 will be extracted directly from twitter APIs.	6 months
2	Dr. Namrata Assistant Prof., Department of Humanities and Social Science	Mapping Sources of Stress, Wellbeing, and Coping Strategies among Students during COVID-19 Pandemic	<p>Objectives of the research:</p> <ol style="list-style-type: none"> 1) To identify sources of stress during COVID-19 among students. 2) To examine the impact of various stressors on wellbeing of students during COVID-19. 3) To explore coping strategies during COVID-19 among students. <p>Expected Outcomes:</p> <ol style="list-style-type: none"> 1. This research will provide a solution in building up public/student-centric health systems, which pre-empt and prevent, feedback loops driven by the burden of human misery. 2. It will provide a platform to developing an effective ICT based physical and mental health care information system for educational institutes. 3. This research aims to offer governments and policymakers evidence-based strategies to improve public and clinical intervention systems. 	7 months

			4. It will provide ways to build resilience, evolve models of mental health beliefs, social support and solidarity for future pandemics or any other emergencies.	
3	Dr. Surabhi Mehrotra Assistant Prof. Dr. Yogesh Garg, Professor Department of Architecture & Planning	Spatial analytics to monitor Covid 19 and suggesting recovery plan	<p>The urban areas are densely populated area, with varied types of population, i.e. age variability, economic variability or social variability. It becomes a mammoth task of administration to manage a pandemic like COVID 19, with its limited resources. Spatial analytics would be used to achieve following objectives:</p> <ol style="list-style-type: none"> 1. Establish linkages between population density, pattern and COVID 19 cases. 2. Spatial analytics of location of Positive COVID cases, and their past mobility pattern 3. Demarcation of critical wards having high vulnerable index (Age, economic criterion and high COVID cases) 4. Identifying Hierarchal Clusters of wards based on critical risks (results from statistical analysis) 5. Resource allocation Plan based on spatial optimisation model. This would include suggestion of testing, allocating recovery centres, health officers, provisional stores 6. The Recovery Plan would include route planning to work destinations such that critical areas (wards) are prevented and economic activities can be resumed after pandemic. 	6 months
4	Dr. Rahul M. Shrivastava, Professor, Department of Bio Science & Engg.	Computational Repurposing of Drugs/Synthetic Compounds for Inhibiting RNA-	To study the interaction of the synthetic compounds/drugs to predict the mechanism of their anti COVID-19 action with the target RNA-dependent RNA polymerase of SARS-Cov-2	7 months

		dependent RNA polymerase (RdRp) in COVID-19 Infection in Humans	<p>components through molecular docking and related approaches for the inhibition.</p> <p>Expected Outcome</p> <p>The outcomes of proposed project will be sustainable in long-term as it will help in computational repurposing of peptide based drugs in coming days and will certainly reduce the time taken for the development of drugs.</p> <p>However, there is need of in vitro study to explore the possible factors acting as enhancers in the virus replication, and in vivo examination is necessary to check the efficacy and potency of the drug used at different stages of treatments. As specific cocktail of antiviral, anti-malarial and immune-suppressive drugs are given to patients, this study can helpful for researchers, scientists and doctors for target based therapy.</p>	
5	Dr. Arvind Mittal, Professor Dr. Prashant V. Baredar, Professor Dr. Meena Agrawal, Assistant Prof. Energy Centre	Empowering the students with enhanced immunity, will power through creative visualization and Neuro Linguistic Programming.	Combating stress issues due to COVID impacts and achieve empowered, energized, creative, confident, contributing all round growth of students.	6 months
6	Dr. Manisha Dubey, Professor Dr. Mukesh Kirar, Assistant Prof. Department of Electrical Engg. Dr. Dharendra Pratap Singh, Assistant Prof.	IOT based Device for quarantine monitoring of infected people. Area: Surveillance	Brief Description: IOT based GPS enabled band will be punched on the hand of the COVID' 19 patient/suspected person which can track the location of the person. The location of such person will be stored on a cloud. If the person moves out of restricted area, an alarm will be sent to nearest police station. Expected Outcome:	1 month

	Dr. Jaytriok Choudhary Assistant Prof. Department of Computer Science & Engg.		<ol style="list-style-type: none"> 1. If suspected person is found as patient of COVID'19, visited locations of such person may be determined based on his movement history. 2. If any COVID'19 patient breaks the movement restriction, an alarm will be sent to nearest police station. 	
7	Dr. Manisha Dubey, Professor Dr. Mukesh Kirar, Assistant Prof. Department of Electrical Engg. Dr. Dharendra Pratap Singh, Assistant Prof. Dr. Jaytriok Choudhary, Assistant Prof. Department of CSE	<p>IOT based health data collection and its analysis.</p> <p>Area: Data analytics, AI to model epidemic patterns and disease dynamics.</p>	<p>Brief Description: Data of people will be collected remotely with the help of IOT enabled medical kits and it will be stored on the cloud. If any person is infected through COVID'19, such person may be categorized for level of treatment on the basis of his/her medical history.</p> <p>Expected Outcome: Based on the analysis of medical history of people:</p> <ol style="list-style-type: none"> 1. People may be categorized for level of required COVID'19 treatment. 2. Estimation of intensive medical facility required for particular area. 	1 month
8	Dr. Pushpender Yadav Assistant Prof. Department of Humanities & Social Sciences,	<p>Pandemic- Corona Virus Disease (CVID-19): It's Impact on Economic and Social Life of Vegetable Growing Farmers in Madhya Pradesh.</p>	<p>Aim of the Project: 1.) To understand the socio economic background of vegetable farmers and impact of pandemic Corona Virus Disease (COVID-19) on their economic and social status.</p> <p>2.) To assess the role of district administration and agriculture department for preparedness and awareness regarding COVID-19 for vegetable growing farmers in the state.</p> <p>3.) To develop a decentralized model for future vegetable growing farmers during Pandemic situation like COVID-19.</p> <p>Data Source: The Primary data will be collected from the sampled respondents with the help of schedule and questionnaires in rural Madhya Pradesh not only this a participative and group</p>	7 months

			discussion with vegetable growing farmers will take place to deep understanding of issue. The Secondary data will be collected from the published work like international and national journals, magazine, reports of commissions and committees, books and newspapers.	
9	Dr. Anjali Dhengle, Assistant Prof. Dr. Varsha Rokade, Assistant Prof. Dr. Vinita Mohindra, Professor Department of Humanities & Social Sciences,	Psychological Health Issues and Solutions under Lockdown Period of COVID 19 Outbreak: A Psychological Experiment	Expected Outcome: The following outcomes are expected from the study (1) Assessment of psychological health of people under Lockdown period of COVID 19 Outbreak. (2) Analysis of behavioral changes of people owing to the toxic psychological health effects of COVID 19 lockdown. (3) Development of strategies for the general wellbeing of psychological health of people.	1 year
10	Dr. D. Kishan Associate Prof. Department of Civil Engg.	Development of Standards for Waste Disposable Generated from Covid – 19 Treatment & Quarantine Centers.	Developing Standard Model and prepare specific norms to collect, classify, summarize, transport and disposal of waste generated from Covid-19 treatment and quarantine centers.	3 to 6 months
11	Dr. Fozia Z. Haque, Associate Prof. Department of Physics Dr. Vinita Mohindra Professor Department of HSS Dr. Varsha Rokade, Assistant Prof. Department of HSS	Production of layered good quality (i) reusable mask made with fabric and (ii) consumable mask made with fabric and fine grade filter paper	Expected Outcome: The fabric based home made mask with 3 layer will be suitable to local public during routine work outside home. The filter paper based mask can be used by healthcare people.	1 month
12	Dr. Fozia Z. Haque, Associate Prof. Department of Physics	Development of nanostructured TiO₂ based photocatalysts for	Expected Outcome: The proposed antiviral and antibacterial paint can used for the hospitals, diagnostic centre and public places to reduce the	06 months

	Dr. Arvind Mittal Professor Energy Centre	antiviral and antibacterial paint	spread of COVID 19. The nanostructured TiO ₂ based antiviral paint will facilitate the adsorption of the virus on the painted surface and consequently damage/degrade the virus by production of reactive oxygen species (ROS) under normal white light.	
13	Dr. Gajendra Dixit Professor Department of Mechanical Engg. Dr. Mohammad Taufik Assistant Prof., Department of Mechanical Engg. Er. Sarad Sharma, M. Tech, Engineering & Research consultant, Bhopal	Fabrication of low cost manual and electric ventilator machine	<p>COVID-19 is stretching health care resources in many different ways, but there's a key piece of equipment getting a lot of attention: ventilators. The machine helps with two important functions: get more oxygen into the lungs and take carbon dioxide out.</p> <p>In this current situation, there is a need for ventilators to cure a large part of the population getting affected by this virus. The shortage of ventilators can make the situation even worse. It is important to make ventilators available in large numbers at the hospitals soon and at a low cost to fight against the situation prevailing.</p> <p>In our work, the ventilator will comprise of frame-mounted by a cam follower mechanism. DC gear motor of 90watt will be brought into use. The cam follower mechanism will bring about the linear oscillation and the follower will exert pressure on the Ambu bag. An Ambu bag is a medical tool used to force air into the lungs of patients and cause the inhaling and exhaling.</p> <p>Expected Output and Outcome of the proposal: In this proposal, the researchers are going to develop a low-cost ventilator machine both manual and automatic that can be effective in treating COVID 19 patients. Once the design and manufacturing work is completed, to review</p>	3 months

			performance and safety parameters, the system is immediately delivered to hospitals for its testing.	
14	<p>Dr. Gajendra Dixit Professor Department of Mechanical Engg.</p> <p>Er. Sarad Sharma, M. Tech, Engineering & Research consultant, Bhopal</p>	Fabrication of Low Cost Automatic Hand Sanitizing Machine	<p>The world is facing covid-19 pandemic situation which has proven to be very hazardous situation. To fight against this social distancing and sanitization is very useful. We Propose designing of an <u>automatic hand sanitizing machine</u> that could be helpful in during this war against covid-19.</p> <p>In this current situation there is a need to install these sanitizing units in the public places to avoid contact with the virus. Also the proposed design makes optimized use of sanitizer to reduce its wastage and avoid overuse.</p> <p>In a broad way, the hand sanitizing device is developed by making use of a acrylic sheet which is cut to a specific dimension. The system comprises of a high pressure pipe with mist nozzle which operates with air pressure and pump. The system is automated by using a controlling unit to sense the presence of hand and gets on automatically.</p> <p>Once the design and manufacturing work is completed to review performance and safety parameters, the system is immediately delivered to hospitals and controlled organizations for use.</p> <p>Expected: In this proposal the researchers are going to develop an automatic sanitizing system that can disinfect the hands of the people during this pandemic condition automatically.</p>	1 month
15	<p>Dr. R. K. Dwivedi Professor, Department of Mechanical Engg. Dr. Shashank Purwar, Professor, AIIMS Bhopal</p>	<p>Design and development of Multi-utility Sanitization chamber to terminate COVID-19 virus</p>	<p>To ensure the complete inactivation of COVID-19 in Organic/Inorganic and Edible/Non-Edible articles at its initial stage of transmission for better and healthy life. This Multi-Utility sanitizing unit will ensure no active residual remains of COVID-19 over specimen</p>	1 month

	Dr. G.Dixit Dr.Arvind Mittal	transmission at initial stage	<p>surface with access to simultaneous techniques at same time at same place.</p> <p>Outcomes:</p> <p>It can be used at various work places like provisional stores, offices, multiplex or at the hotspots of COVID-19 where risk of transmission through exchange of media is higher.</p> <p>Although along with complete inactivation of COVID-19 it will save time, money travelling expenses and fear of transmission from any type of Daily Need Articles.</p>	
16	Dr. Mohammad Taufik Assistant Prof., Department of Mechanical Engg.	<u>Development of 3D Printed arm or elbow operated water tap handles to make the water tap handles safer in common washrooms</u>	<p>When planning a generalized strategy to protect our health workers, officers and factory laborers, etc. working at hospitals, factories and similar most crowded places from the coronavirus (COVID 19), infection through water taps is a serious issue. Water taps are set to be among the most contagious because of common washrooms have been permitted at crowded places. Therefore, to prevent direct hand contact, 3D printing can be utilised to fabricate "L" shape object along with large and small end arms. A small end arm resembles the shape of the upper mould of the water tap handle that is meant to fit on the handle of the water taps and enables it to open through the larger side with arm or elbow.</p> <p>Expected Output and Outcome of the proposal:</p> <p>To make an "L" shape object that can be fit on the water tap handles and permit to open them with arm or elbow to make the water taps safer during public use of common washrooms at the crowded places. After the development of these 3D printed parts, it is</p>	1 month

			expected to be delivered to hospitals, factories and similar most crowded places for its installation.	
17.	Neha Pranav Kolhe, Dr. Surabhi Mehrotra Assistant Professor Architecture and Planning	COVID-19 Vulnerability Assessment of slums using Morphological Parameters	Objectives: 1. Developing Slum Typologies based on morphological parameters using spatial metrics 2. Identification of morphological parameters that are responsible for vulnerability in relation to COVID'19 3. Identification of vulnerable slum settlements to COVID that require prior attention for mitigation.	7 month

Directors Approval Dated 28th April 2020

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