A new AI-driven platform will facilitate early-COVID interventions over Whatsapp

A new AI-driven platform will now help early intervention through rapid screening of COVID 19 with the help of Chest X-ray interpretation over WhatsApp for doctors who have access to X-ray machines. The solution called XraySetu can work with low-resolution images sent via mobiles, is quick and easy to use, and can facilitate detection in rural areas.

As COVID 19 continues to wreak havoc across the rural heartlands of India, it has become critical to drive rapid testing, contact tracing, and create dedicated containment zones. At a time when such tests are taking more than a week across some cities, the challenge is even more for rural areas. Easy alternative tests are necessary as RT-PCR tests also give a 'false negative' for some variants.

ARTPARK (AI & Robotics Technology Park), a not-for-profit foundation established by the Indian Institute of Science (IISc), Bengaluru, with support from the Department of Science & Technology (DST), Govt. of India, in collaboration with Bangalore based HealthTech startup Niramai and the Indian Institute of Science (IISc), has developed XraySetu specifically designed to identify COVID positive patients even from low-resolution Chest X-Ray images sent over Whatsapp.

It also has semantic annotations of affected areas for review and localized heatmap by doctors to help them verify it easily with other modalities and has already served close to 1200+ reports so far from the interior parts of India.

To conduct the health check, any doctor simply needs to visit www.xraysetu.com and click on the 'Try the Free XraySetu Beta' button. The platform will then redirect the person to another page, wherein he or she can choose to engage with the WhatsApp-based chatbot via web or smartphone application. Or the doctor can simply send a WhatsApp message to the phone number +91 8046163838 to start the XraySetu service. Then they just need to click the picture of the patient's X-ray and obtain the 2-page automated diagnostics with annotated images in a few minutes. While extending the probability of the COVID-19 contraction, the report also highlights a localized heatmap for a quick perusal of the doctor.

Tested and validated with over 1,25 000 X-ray images from National Institute of Health, UK, as well as over 1000+ Indian COVID patients from, XraySetu, has shown excellent performance with Sensitivity: 98.86%, and Specificity: 74.74%

Mr. Umakant Soni, Founder, and CEO, ARTPARK, said, "We need to scale technology for addressing the needs of 1.36 billion people, especially considering we have 1 radiologist for over 1 million people here. Built with the collaboration of industry and academia, XraySetu paves the way for exponential technologies like AI to leapfrog and provide cutting-edge healthcare technology to rural India in an extremely cost-effective manner.

"NIRAMAI has partnered with ARTPARK and IISc to provide a rapid COVID screening method for rural doctors who have access to X-ray machines. XraySetu provides an automated interpretation of Chest X-Rays to predict if a patient has any lung abnormality that indicates COVID-19 infection," said Dr. Geetha Manjunath, Founder, and CEO, Niramai.

"In the absence of COVID positive X-Ray images, we developed a unique Transfer Learning framework that leverages easily available X-ray images of lungs, not necessarily COVID positive, to learn useful features which have high predictive power. We also developed a confidence score

which is guided by the areas of lungs that are infected. The system outputs a prediction, localizes the infected parts, and creates a report which gives a confidence score, all within a few minutes", said Prof. Chiranjib Bhattacharyya, IISc.

Besides COVID-19, the platform can also detect 14 additional lung-related ailments, including tuberculosis and pneumonia, alongside others. It can further be used for both analog and digital X-rays and has been successfully piloted by more than 300 doctors in rural areas over the last 10 months.
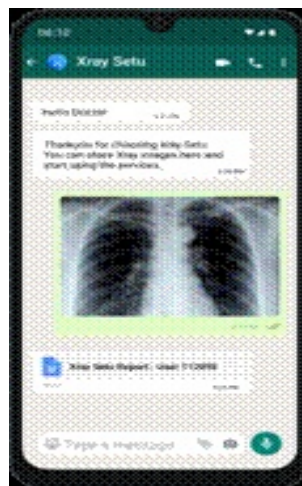
Technologies like XraySetu can enable cutting-edge AI-driven systems powering mobile PHCs, which can make healthcare more accessible even across rural India at a fraction of the cost.
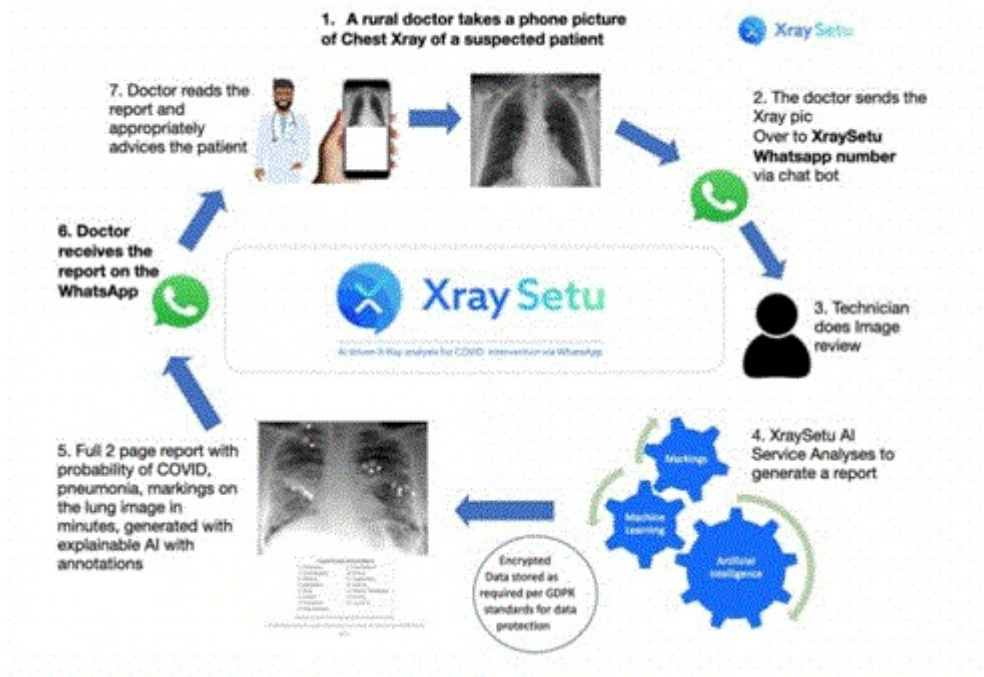
Dr. Padmanabh Kamath, Prof & HOD Cardiology, KMC, Mangalore, who has been an early advisor and user of XraySetu, stressed that technologies like these could take healthcare and technology to the underprivileged and rural areas. Another early user of the service, Dr. Anil Kumar A D, Medical Officer of Health, Shimoga in Karnataka, was happy that the technology is helping to get the quick diagnosis of patients.

"Several Hubs of Cyber-physical Systems established by DST are working on leveraging of Artificial Intelligence, Virtual Reality, Data Analytics, Robotics, Sensors and other tools to address the challenges of the health sector from diagnostics, and drug design to biomedical devices to telemedicine," said Prof Ashutosh Sharma, Secretary, DST.

ARTPARK, initiated under the National Mission on Interdisciplinary Cyber-Physical Systems (NM-ICPS), is further collaborating with infrastructure partners like C-DAC (for leveraging AI supercomputer ParamSiddi), Nvidia& AWS to scale this free service to all the doctors in rural India.

For further details, Mr. Umakant Soni, Founder, and CEO, ARTPARK, can be contacted at umakant@artpark.in.

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