ARTPARK launches XraySetu, a free-to-use AI-driven platform to aid doctors for early-COVID interventions over Whatsapp

Developed in collaboration with Niramai Health and IISc, XraySetu takes a few seconds to interpret Chest X-rays with 98.86% sensitivity[1] towards COVID-19

Bengaluru, May 22, 2021: As COVID-19 continues to wreak havoc across the rural heartlands of India, it has become more critical to drive rapid testing, contact tracing, and create dedicated containment zones. However, the rural infrastructure is not as well developed as it is across cities. So, when the respective tests are taking more than a week across some cities, the plight of our rural geographies – home to about two-thirds of the Indian population – in the second wave is easily understood. The fact the RT-PCR tests also give a 'false negative' for some of the variants only adds to the situation.

ARTPARK (AI & Robotics Technology Park) has extended some relief on this front by launching XraySetu. AI researchers at ARTPARK In collaboration with HealthTech startup Niramai and the Indian Institute of Science (IISc), have developed XraySetu, an AI-driven solution for the early intervention of COVID-19 cases across India with Chest Xray interpretation over WhatsApp. The entire service is quick and easy to use.

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 +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 Xray images from National Institute of Health,UK as well as over 1000+ Indian covid patients from, XraySetu has shown excellent performance on open source standard data sets as below:

Sensitivity[2] : 98.86%

Specificity[3]: 74.74%

---

[1] Sensitivity (True Positive rate) measures the proportion of positives that are correctly identified (i.e. the proportion of those who have some condition (Covid affected) who are correctly identified as having the condition).

[2] Sensitivity (True Positive rate) measures the proportion of positives that are correctly identified (i.e. the proportion of those who have some condition (affected) who are correctly identified as having the condition).

[3] (True Negative rate) measures the proportion of negatives that are correctly identified (i.e. the proportion of those who do not have the condition (unaffected) who are correctly identified as not having the condition).

AUC[4]: 0.9316

XraySetu has been 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 as well. Since its launch it has already served close to 1200+ reports so far from the interior parts of India.

Mr. Umakant Soni, Founder and CEO, ARTPARK said,

"The second wave of COVID-19 has really exposed the frailty of our current healthcare ecosystem. Scaling manpower is futile in a big, populous, and diverse country like India. We need to scale technology for addressing the needs of 1.36 bn people, especially considering we have 1 radiologist for over 1 million people here. 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. Built with the collaboration of industry and academia, XraySetu can serve as a great template for bringing such technology-driven innovations to the heartlands of India. " - **Mr. Umakant Soni, Founder and CEO, ARTPARK** said**.**

"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. This service is provided over a simple messaging platform like WhatsApp with an input of a simple photo of the X-Ray image." **Dr. Geetha Manjunath, Founder and CEO, Niramai**.

"The biggest challenge that we faced at the start of the project a year ago was the lack of COVID positive X-ray images. To circumvent this problem, 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 saw that Doctors tend to trust more if some sort of explanation is provided. To this end, we 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**.

On top of COVID-19, the platform can also ably detect 14 additional lung-related ailments including tuberculosis and pneumonia alongside others. XraySetu can further be used for both analog as well as digital X-rays and work with low-resolution images sent via mobiles. XraySetu has successfully piloted more than 300 doctors in rural areas over the last 10 months.

[4] In general, an AUC of 0.5 suggests no discrimination (i.e., ability to diagnose patients with and without the disease or condition based on the test), 0.7 to 0.8 is considered acceptable, 0.8 to 0.9 is considered excellent, and more than 0.9 is considered outstanding.

India is looking to invest more than Rs. 64,000 crores to overhaul the Indian healthcare system as per the 2021 budget. Instead of building physical PHCs, 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, remarked **"** I have been a biggest proponent of taking healthcare and technology to the underprivileged and rural areas." Another early user of the service, Dr. **Dr. Anil Kumar A D, Medical Officer of Health, Shimoga in Karnataka remarked, "**I am very happy to witness how technology is helping to get the quick diagnosis of patients. **XraySetu** has been helping us to get the analyses of the patient in a very quick time. It is a very easy, reliable and accessible solution for doctors. **"**

ARTPARK is further collaborating with infrastructure partners like C-DAC (for leveraging AI supercomputer Param Siddi), Nvidia & AWS to scale this free service to all the doctors in rural India. If you are a doctor in rural heartland, you can try the service at www.xraysetu.com. ARTPARK is also inviting other institutions and universities to help further research and create a wider imaging service built for rural India for 14 other lung abnormalities.

If you wish to volunteer for the cause, please feel free to reach out to the XraySetu team here and share with #XraySetu to build awareness about it.

About ARTPARK:

AI & Robotics Technologies Park (ARTPARK) is a one-of-its-kind, not-for-profit foundation established by the Indian Institute of Science (IISc), Bengaluru with support from AI Foundry in a public-private collaborative model, to promote technology innovations in AI (Artificial Intelligence) & Robotics. With seed funding of Rs. 170 Cr ($22mn) from the Department of Science & Technology (DST), Govt. of India, under the National Mission on Interdisciplinary Cyber-Physical Systems (NM-ICPS), the ecosystem is designed to bring about a collaborative consortium of partners from industry, academia, and government bodies. These innovations are led to create a societal impact by executing ambitious mission-mode R&D projects in healthcare, education, mobility, infrastructure, agriculture, retail, and cyber-security that focus on problems unique to India. It further received a Rs. 60 cr grant from Dept. of IT & BT, Govt. of Karnataka to create cutting-edge innovations in terms of new technologies, standards, products, services, and intellectual properties out of India.

About Niramai:

NIRAMAI Health Analytix is a Bangalore-based AI startup addressing critical healthcare problems through automated solutions. Recognized as one of the top 100 global AI startups by

CBInsights. Niramai's mission is to create a Universal Cancer Screening Method that can save lives by using AI-driven thermal imaging.

About IISc:

Founded in 1909, the Indian Institute of Science (IISc) is the oldest research university in India. QS World University rankings ranked IISc second in the world in terms of citations per faculty. With more than 2000+ Ph.D. students in multi-disciplinary areas, it has one of the largest AI & Robotics research clusters in India.