

## *XraySetu for Early Detection of Lung Conditions in COVID-19*

1. [XraySetu](#) is an AI based Image analysis tool developed indigenously by [ARTPARK](#), [Niramai](#) and IISC-Bangalore, supported by DST and Govt. of Karnataka, over last 10 months. It has been spearheaded by Mr. Umakant Soni CEO, ARTPARK.
2. The rationale for the development of this tool was the fact that in rural India there is less than 1 radiologist to every million people. With reduced access to RTPCR tests and the virus going straight to lungs during phase 2, scores of people were seen wanting early diagnosis and intervention. XraySetu is an Artificial Intelligence driven Chest Xray interpretation done over Whatsapp for Doctors.
3. XraySetu allows Doctors in rural areas to plan early intervention for their patients by simply taking a picture of their Xray and sending it for diagnosis/ corroborative diagnosis via Whatsapp. In rural settings where there are limited resources, the Doctor captures the image of an X-ray radiology report and sends it to XraySetu WhatsApp number (+918046163838). The technician reviews the image and further processes it for analysis through XraySetu AI service. The software analyses the scan and generates a detailed report with annotations on the lung X-Ray image. The AI generated report is then sent to the Doctor for appropriate treatment.
4. The free beta version can be seen for use at [www.xraysetu.com](http://www.xraysetu.com). A pdf presentation is also enclosed for your reference and use. It highlights the advantages of Xraysetu as:
  - i. Mobile messaging Interface makes it a simple and accessible service
  - ii. Rapid automated interpretation enables early intervention for covid patients
  - iii. Supplemental screening modality to RTPCR addressing delays on RTPCR reporting
  - iv. Works for both analog and digital XRay machines
  - v. No integration needed with existing systems; easily pluggable for any medical unit
  - vi. Works on low resolution images sent over mobile messaging system
  - vii. Explainable AI: semantic annotations of affected areas for review by doctors

- viii. Framework suitable for several lung abnormalities and variants of infection
  - ix. Localized heatmap for easy review
    - x. 2-page automated report generation with annotated images and probability of covid or pneumonia
    - xi. Explainable AI: marking 15 different lung abnormalities, including Covid
    - xii. Uses Deep-Multi-task Learning Network
5. The main highlight of using XraySetu is that the Doctor has access to the test result in a few minutes as opposed to days, for better prognostic evaluation of the patients, which would help in saving lives. The test has very good performance standards with sensitivity (proportion of positives that are correctly identified) of 98.86% and specificity (true negatives) of 74.74%.
  6. XraySetu platform has been developed using machine learning algorithms that have utilized 1,25,000 validated X-ray images from open-source NIH (UK) X-ray database as well as 1000 COVID-19 patients in India. The image analysis software anonymizes personal details to secure the identity of the individuals. Since the images and summary reports are shared via WhatsApp, they are protected by end-to-end encryption. The privacy policy of the consortium claims that any data shared by individuals with XraySetu would not be further shared with other agencies, platforms or third parties.
  7. CEO ARTPARK Mr. Umakant Soni feels that this could be the model for future of Indian healthcare, accessible to everyone wherever one might be.
  8. More than 300 doctors have used this platform and validated its use by recommendations to other doctors. XraySetu is compatible with images obtained by both digital and analog X-ray machines, and the platform can also process images with low resolution. XraySetu can be useful in detecting 14 other lung abnormalities which include pneumonia, edema, and fibrosis, apart from COVID-19 related diagnosis.
  9. XraySetu has garnered very positive testimonials from doctors and radiologists. It has been extensively covered in Indian media and by select international media (Swedish radio).
  10. CEO ARTPARAK Mr. Umakant Soni (Email: [umakant@artpark.in](mailto:umakant@artpark.in)) has conveyed that they would be happy to share XraySetu platform with others.

Mr. Syed Adil Hassan ([adil@artpark.in](mailto:adil@artpark.in)), head of marketing and communications would provide help in coordination of any communication related queries and Cmdr. Syed Qais Hyat ([qais@artpark.in](mailto:qais@artpark.in)), President – Strategy and Operations for any other queries about XraySetu. You are requested to establish contact with them directly and with DST if XraySetu is of relevance.

11. The utility of States/ hospitals in India adopting this AI based platform is:

- i. Effective testing strategies like XraySetu might help in early detection and treatment during subsequent waves of Covid infections.
- ii. AI based strategies would pave a way forward for cutting-edge healthcare strategies for mass use and be an easily useable resource in poor rural regions or remote areas.
- iii. The success of this initiative would provide impetus for development of new strategies for surveillance and detection of other diseases.
- iv. “Digital health”- a facilitative nexus of health professionals and AI/IT technologies would be indispensable for implementing improved equitable healthcare at affordable costs in the future.

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