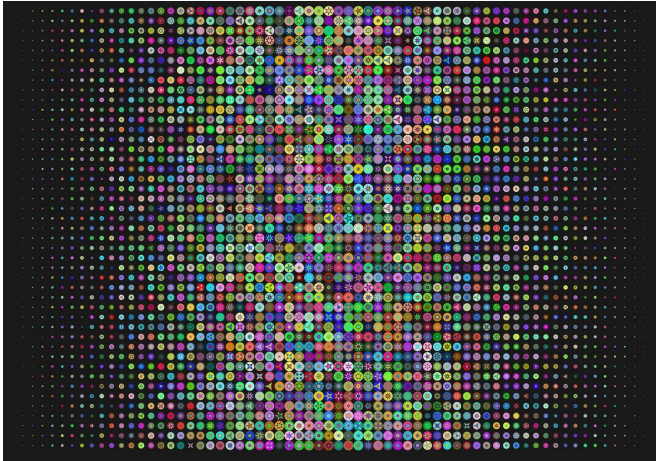


Team develops AI algorithm to analyze chest X-rays for COVID-19

1 October 2020



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A team of researchers at the University of Minnesota recently developed and validated an artificial intelligence algorithm that can evaluate chest X-rays to diagnose possible cases of COVID-19. Working together with M Health Fairview and Epic, the algorithm will be available at no cost to other health systems through Epic, the medical records software used by many health care organizations across the country. Today, all 12 M Health Fairview hospitals use the new algorithm.

When a patient arrives in the [emergency department](#) with suspected COVID-19 symptoms, clinicians order a chest X-ray as part of standard protocol. The [algorithm](#) automatically evaluates the X-ray as soon as the image is taken. If the algorithm recognizes patterns associated with COVID-19 in the chest X-ray—within seconds—the care team can see within Epic that the patient likely has the virus.

"This may help patients get treated sooner and prevent unintentional exposure to COVID-19 for

staff and other patients in the emergency department," said Christopher Tignanelli, MD, assistant professor of surgery at the University of Minnesota Medical School and co-lead on the project. "This can supplement nasopharyngeal swabs and diagnostic testing, which currently face supply chain issues and slow turnaround times across the country."

Tignanelli led the project with several key players, including Ju Sun, Ph.D., assistant professor at the U of M College of Science and Engineering; Erich Kummerfeld, Ph.D., research assistant professor at the U of M Institute of Health Informatics; Genevieve Melton-Meaux, MD, Ph.D., professor of surgery at the U of M Medical School and chief analytics and care innovation officer for M Health Fairview; and Tadashi Allen, MD, assistant professor of radiology at the U of M Medical School.

To develop the algorithm, the team led by Sun analyzed de-identified chest X-rays taken at M Health Fairview since January. To train it to diagnose COVID-19, Sun's team used 100,000 X-rays of patients who did not have COVID-19 and 18,000 X-rays of patients who did.

"The power of modern AI and computer vision is precise, and automatic extraction of effective visual patterns from imaging data enables rapid decision-making. Our model learns from thousands of X-rays and detects COVID-19 in seconds, then immediately shows the risk score to providers who are caring for patients," Sun said.

Once the team validated the algorithm, Melton-Meaux worked with colleagues at M Health Fairview and Epic to build the infrastructure around the algorithm, designing it to seamlessly and immediately translate the algorithm's findings into the medical record software and notify care teams. The U of M and Fairview teams decided to make their algorithm available free of charge in the Epic

App Orchard for more than 450 [health](#) care systems worldwide.

"This project speaks to the power of our M Health Fairview partnership, and our ability to apply research in real time to improve patient care," Melton-Meaux said. "Using this tool gives us the ability to reduce the spread of COVID-19 and save lives, so sharing it with other [health systems](#) makes a lot of sense. Especially in regions with high infection rates or potentially less access to testing, the fight against COVID-19 requires all of us to work together."

Drew McCombs, an Epic software developer who worked closely with the U of M and Fairview teams, says current customers can install Cognitive Computing and the new algorithm in as little as 10 days, then begin end-user training.

"Epic software puts the University of Minnesota's algorithm for predicting COVID-19 from X-rays into practice," McCombs said. "Our Cognitive Computing platform quickly pulls the X-ray, runs the algorithm, and shows the resulting prediction directly in Epic software that doctors, nurses, and support staff use every day—speeding up treatment and helping protect staff. The algorithm is available to healthcare organizations around the world that use Epic."

Provided by University of Minnesota

APA citation: Team develops AI algorithm to analyze chest X-rays for COVID-19 (2020, October 1) retrieved 1 October 2022 from <https://medicalxpress.com/news/2020-10-team-ai-algorithm-chest-x-rays.html>

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