



# AI-enabled support tool for COVID-19 diagnosis using chest x-rays

A deep learning model for screening COVID-19 patients using chest x-rays with >98% accuracy.

Technology No. 2020-343

**IP Status:** US Patent Pending; **Application #:** 17/302,373

## Applications

- Machine learning / health IT

## Key Benefits & Differentiators

- High accuracy and sensitivity; AUPRC of 0.98, AUROC of 0.99
- Uses chest x-rays, which are more widely available compared to CT-based COVID-19 screening.
- Distinguishes between COVID-19 CXRs and non-COVID-19 CXRs with other pulmonary pathology; AUPRC of 0.98, AUROC of 0.99
- Ideal for integrating within EHR, PACS and DICOM
- Large training CXR dataset: 220 COVID-19, >14k non-COVID-19 pulmonary pathology, and >19k negative controls

## Overview

Researchers at the University of Minnesota have developed a deep learning model that can analyze chest x-rays to screen for COVID-19 patients. Trained using a large CXR-dataset of patients with COVID-19, pulmonary pathology, and negative controls, this neural network model can successfully differentiate CXRs of COVID-19 patients from non-COVID-19 CXRs with 98% accuracy. Furthermore, this model can accurately discriminate COVID-19 CXRs from similar non-COVID-19 pulmonary pathology with an accuracy of 98.5%. The performance of these models is adequate for the established role of CXR as a frontline support tool for screening and triage at patient intake. If properly incorporated as an AI-enabled clinical decision support into the workflow of current diagnostic modalities, our model has the potential to considerably improve the speed and reliability of current screening procedures.

The novel deep learning model discussed here is shown to have high sensitivity, positive and negative predictive values.

## Phase of Development

**TRL: 4**

Prototype/Pilot scale demonstration

## Desired Partnerships

This technology is now available for:

- License
- Sponsored research
- Co-development

Please contact our office to share your business' needs and learn more.

## Press Releases

[Kare11](#) October 2020

## Researchers

- [Christopher Tignanelli, MD](#) Assistant Professor, Division of Critical Care/Acute Care Surgery, Department of Surgery
- [Genevieve Melton-Meaux, MD, PhD](#) Professor, Department of Surgery

<https://license.umn.edu/product/ai-enabled-support-tool-for-covid-19-diagnosis-using-chest-x-rays>