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NEHU Professor research highlighted in WHO Impactful Research Repository on COVID-19

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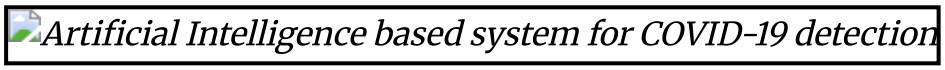
The work carried out by Dr. Dinesh Bhatia, Biomedical Engineering Department, North-Eastern Hill University (NEHU), Shillong and his collaborators from Adamas University, Kolkatta led by Prof. Moumita Mukherjee, Dean (R&D), and Dr. Swarnava Biswas, Neotia University, Kolkatta has been recognised and highlighted by World Health Organisation (WHO) website in their "Impactful Research Repository" on COVID-19. The work deploys the use of Internet of Things (IoT)-based infrastructure for early detection, identification and isolation of COVID-19 patients. The system is working on a cloud-based AI-enabled fast and low-cost solution to detect coronavirus infected patients based on Multiple Inference Hypothesis Inference Criterion is the first research that any research group has attempted to do so.

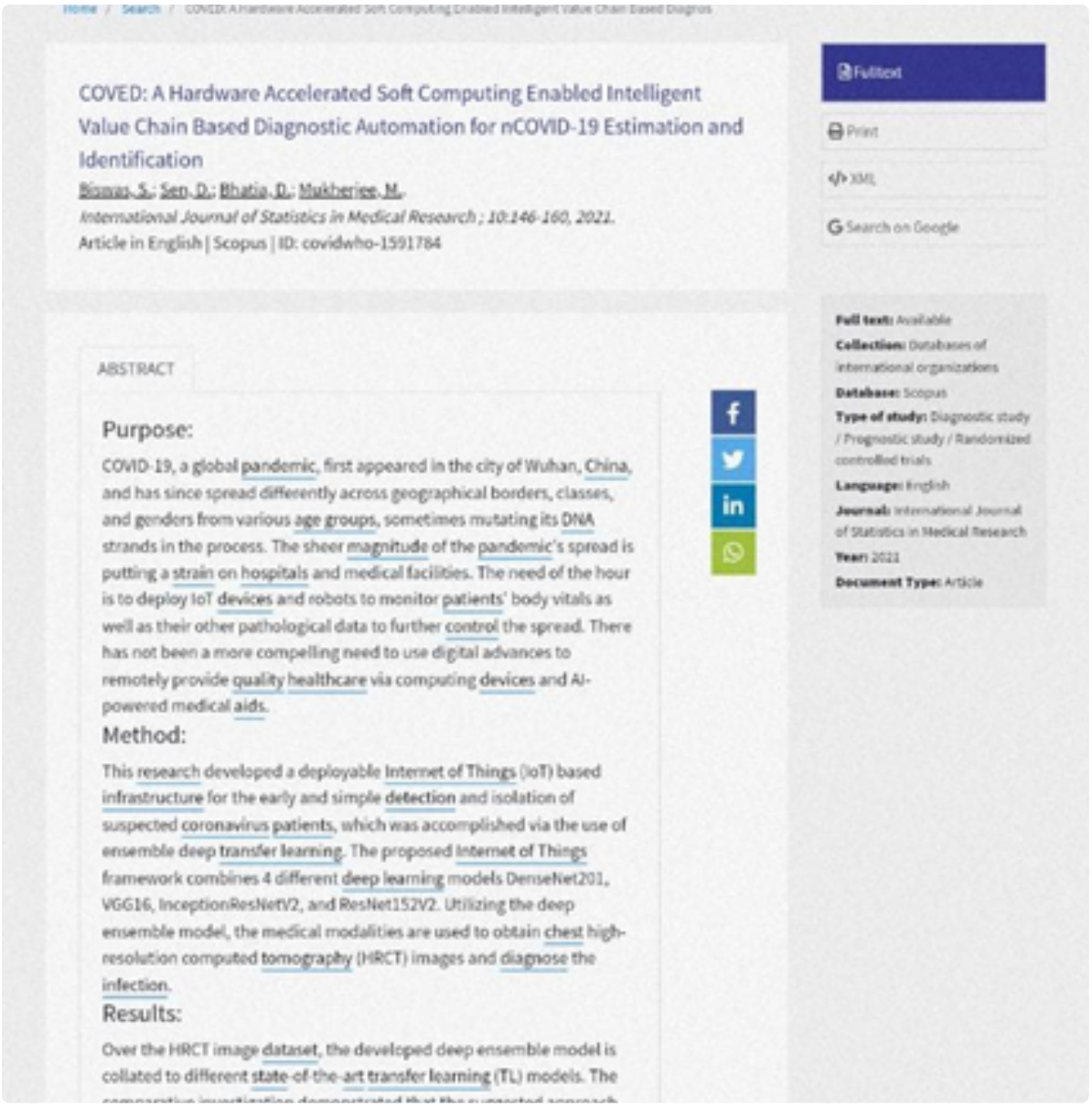

Artificial Intelligence based system for COVID-19 detection

Artificial Intelligence-based system for COVID-19 detection

The originality is in a single point multi-hypothesis based on faster identification of COVID-19 from radiography pictures and other medical vital conditions, with severity score tag for early detection with accuracy scores of more than 90%. The Automated detection tool would provide a helpful second opinion to clinicians and assist them in the screening process more promptly and effectively. The research employs data science and machine learning approaches to analyse radiographic pictures to identify COVID-19.

As per Prof. Mukherjee, “The software employs Artificial Intelligence-based techniques for detecting COVID-19 on chest radiographs (X-rays and CT scans), with other medical vitals such as temperature, oxygen saturation, and even pathological data from blood examination such as leukocyte, lymphocyte and neutrophil count”.

As per Dr. Bhatia, with the support of the government and healthcare sector, additional data is being procured to further expand the study to avoid false negative results and identify asymptomatic patients. Since it is a faster and less expensive technique, it may be considered as a complimentary detection tool with presently available techniques.



COVED: A Hardware Accelerated Soft Computing Enabled Intelligent Value Chain Based Diagnostic Automation for nCOVID-19 Estimation and Identification

Biswas, S.; Sen, D.; Bhatia, D.; Mukherjee, M.

International Journal of Statistics in Medical Research ; 10:146-160, 2021.

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Full text: Available

Collection: Databases of international organizations

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ABSTRACT

Purpose:

COVID-19, a global pandemic, first appeared in the city of Wuhan, China, and has since spread differently across geographical borders, classes, and genders from various age groups, sometimes mutating its DNA strands in the process. The sheer magnitude of the pandemic's spread is putting a strain on hospitals and medical facilities. The need of the hour is to deploy IoT devices and robots to monitor patients' body vitals as well as their other pathological data to further control the spread. There has not been a more compelling need to use digital advances to remotely provide quality healthcare via computing devices and AI-powered medical aids.

Method:

This research developed a deployable Internet of Things (IoT) based infrastructure for the early and simple detection and isolation of suspected coronavirus patients, which was accomplished via the use of ensemble deep transfer learning. The proposed Internet of Things framework combines 4 different deep learning models DenseNet201, VGG16, InceptionResNetV2, and ResNet152V2. Utilizing the deep ensemble model, the medical modalities are used to obtain chest high-resolution computed tomography (HRCT) images and diagnose the infection.

Results:

Over the HRCT image dataset, the developed deep ensemble model is collated to different state-of-the-art transfer learning (TL) models. The

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