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# CMC student develops app to detect, measure radiation

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Vellore: A student of the Christian Medical College (CMC), Vellore, has developed an Android-based application to turn a smartphone into a radiation detector.

With the newly developed app SPRADDET (smartphone radiation detector), the complementary metal oxide semiconductor (CMOS) and the sensor used in the smartphone can be used as a dosimeter for measuring ionizing radiations such as X-rays and gamma rays.

Though there were several mobile applications that can detect radiation, this application has an advantage of measuring radiation. "It can detect and measure the radiation from raw and external sources. The application can be downloaded and used offline," said Josmi Joseph, an MSc medical physics student, who developed the application as part of the thesis.

It took seven months for her to develop the application and she was planning to carry out a study to use this app for personal and area monitoring. "The application will be available in Google play store soon," she said.

Citing her findings, Joseph said that the CMOS sensor used in a smartphone is an imaging sensor, which is intrinsically sensitive to gamma and X-ray photons. As a result of the interaction of gamma or X-ray photons, a number of specks are formed on the screen. It is observable in the absence of visible light. The number of specks formed is directly proportional to the amount of the photons dose given.

The application does real-time processing of camera preview with a frame rate of 30 frames per second. "The phone's camera

should be covered with black tape to prevent visible light. It does real-time processing of camera and will predict the number of specks. Speck is directly proportional to the amount of dose given to the patient," she said.

Dr Rabi Raja Singh, guide, and professor of radiological physics, said it can quantify the dose delivery for cancer patients. "There are already downloadable mobile applications, but they can only detect radiation. This application is different and it has a calibration component. It can measure radiation doses for different types of energies," he said.

"The application will also bring down the cost of treatment," he said, adding that at present, radiation dosimeters costing Rs 8 to 10 lakh were being used in radiotherapy units to quantify the dose in a patient's body. It can be replaced with a smartphone with SPRADDET application.

It can also be used for radiation measurement not only in the normal condition but also during any nuclear disaster.