



Informatics Institute of Technology

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University of Westminster

**Hybrid Automated Image anomaly detection and Image Reconstruction  
with GAN for Medical Image Enhancement**

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## **Abstract**

Gan architectures are getting popular in image generation and reconstruction domains due to its capabilities on discriminating and generating realistic images. GAN architectures are able to generate images according to the data set it is given to train and learn and they are heavily depended on the source image. Radiographic images will have various anomalies due to patient behavior or faults when machine producing the results. When such anomalies occurred, radiologists tend to take another radiographic image of the patient exposing them for additional radiation. Considering GAN's the ability to generate realistic images based on the dataset it's been trained on, this generative capability can be used to reduce such anomalies in producing radiographic images. This research is conducted to introduce GAN with its super resolution approach to reduce such anomalies with addition to a detection and enhancement layer for anomalies detected to reduce its source image dependency by enhancement to the medical imaging domain. The current research was conducted on a data set of Chest X-ray, CT scans and Knee Joint X-ray based images and was able to achieve high PSNR and SSIM scores comparing to other existing literature. With the introduction of GAN's Image reconstruction with anomaly detection and enhancement for medical imaging domain, will assist patients by reducing their chances for additional radiation exposure and save money for hospitals on radiographic image production when anomalies are found in radiographic images.

**Subject Descriptors:** Hybrid Automated Image anomaly detection and Image Reconstruction with GAN for Medical Image Enhancement

**Keywords:** Generative Adversarial Networks, Blurring, Low contrast, Super resolution, Anomaly Detection, Filter Enhancement, Radiographic Images, Chest X-ray, CT Scans, Knee Joint X-ray, Image reconstruction.