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NUTTAWAN JANGSRI : AN EVALUATION OF SPATIAL  
RESOLUTION IN COMPUTERIZED TOMOGRAPHY. THESIS ADVISORS :

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Spatial resolution of a computerized tomography(CT) scanner is the ability to record fine, high contrast detail. It measures how faithfully the input signal is reproduced at the output display and can be expressed as full width half maximum (FWHM) and modulation transfer function(MTF). Since some CT scanners presently used in Thailand do not have MTF finding software, calculating MTF value is difficult, requiring a computer to do complex mathematical. Therefore, the aim of this research is to present the methods of spatial resolution measurement for FWHM and MTF in a CT scanner with accuracy and efficiency without the use of special software. Catphan™ phantom was used to measure spatial resolution in 11 CT scanners. The method fits the measured point spread function(PSF) data with a Gaussian function that has a single value of the spatial resolution of the CT units. The characteristic of parameter is related to the FWHM of the PSF. The method assumes radial symmetry for the PSF. The MTF of a Gaussian PSF is also Gaussian in form. Hence, once the PSF is fitted with a Gaussian function, the MTF can be directly determined by a simple equation. Data taken from eleven different scanners illustrate that the Gaussian approximation to the PSF is reasonable; the correlation coefficient is greater than 0.99 in each scan. Furthermore, the standard Fourier transform computed MTF show good agreement with the MTF obtained from the Gaussian PSF which are tested by Correlation and Student t-test showing the reliability of 99% (Correlation :  $r > 0.99$ , Student t-test :  $p_{\text{value}} > 0.01$ ).