IMAGE REGISTRATION IN FREQUENCY DOMAIN USING POWER CEPSTRUM METHOD

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Abstract
Delivering information can be done through image. It’s possible to loss information contained in image if their quality is bad, like too blurry, too grainy, or too dark. So there is a technique that required to improve image quality and that technique is Super Resolution.

Super Resolution is a technique used to build image from lower resolution to higher resolution. In this technique there are two steps, namely the registration and reconstruction. Registration is a process to obtain the value of the shift between two images. Image Registration performed in the frequency domain using Fourier Transform, which is the matrix value of the image is transformed from spatial domain into frequency domain.

Power Cepstrum method is used in this final project to solve Image Registration problems. Cepstrum is the logarithm of the spectrum of a signal is transformed using a Fourier transform. Power cepstrum is used to obtain the value of the shift between two images. In the one-dimensional problems, the power cepstrum of a function of time is the power spectrum of the logarithm of the power spectrum function. In the two-dimensional problems, the function is changed into the an image intensity function.

From many tests that have been done, it appears that image registration software using Power cepstrum method capable of detecting a shift in the level of pixels with a maximum shift value of 30 pixels.
Keywords: image registration, power cepstrum, fourier transform, frequency domain