



## INTISARI

### SISTEM CITRA FOTOAKUSTIK *REAL-TIME* BERBASIS LASER DIODA

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Telah dilakukan pengembangan sistem citra fotoakustik *real-time* yang menitikberatkan pada rekonstruksi tiap data yang dapat dimonitor oleh pengguna secara *real-time*. Sistem citra dilengkapi dengan fitur lain yaitu indikator estimasi waktu dan progres, juga beberapa *digital image processing*: interpolasi 2-D, *automatic thresholding*, *minimum filter*, dan *distortion removal*. Hasil karakterisasi beberapa komponen dan pengujian sistem citra menunjukkan bahwa pergeseran stage minimum adalah 0,02 mm, laju pengambilan data maksimum 10 data/detik, dan resolusi lateral sistem sekitar 135  $\mu\text{m}$ . Plastik dapat dicitrakan dengan baik pada frekuensi 19 kHz dan *duty cycle* 40%. Sistem citra mampu menghasilkan citra mentah yang optimal pada resolusi  $2,09 \pm 0,03$  pixel/mm dengan akurasi 95% untuk objek berukuran beberapa milimeter.

Kata kunci: citra, fotoakustik, *real-time*, resolusi.

## ABSTRACT

### **REAL-TIME PHOTOACOUSTIC IMAGING SYSTEM BASED ON DIODE LASER**

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A real-time photoacoustic imaging system development has been carried out which focuses on the reconstruction of each data that can be monitored by the user in real-time. The imaging system is equipped with other features, namely time and progress estimation indicators, and also several digital image processing: 2-D interpolation, automatic thresholding, minimum filter, and distortion removal. The results of the characterization of several components and imaging system testing show that the minimum stage shift is 0.02 mm, the maximum data capture rate is 10 data/second, and the lateral resolution of the system is about 135  $\mu\text{m}$ . Plastics image captured well at 19 kHz frequency and 40% duty cycle. The imaging system is capable to produce optimal raw images at a resolution of  $2.09 \pm 0.03$  pixels/mm with an accuracy of 95% for objects with several millimeters size.

Keywords: image, photoacoustic, real-time, resolution.