VELOCITY MEASUREMENT OF FLOWING PARTICLE USING COMBINATION OF LASER AND OPTICAL SENSOR

AHMAD SUZAIRY BIN SUKOR

This report in partial fulfillment of the requirements for the award of Bachelor of Electronic Engineering (Computer Engineering) With Honours

Faculty of Electronic and Computer Engineering
Universiti Teknikal Malaysia Melaka

October 2007

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FAKULTI KEJURUTERAAN ELEKTRONIK DAN KEJURUTERAAN KOMPUTER

BORANG PENGESAHAN STATUS LAPORAN
PROJEK SARJANA MUDA II

Tajuk Projek	:	Velocity Measurement of Flowing Particle Using Combination of Laser and Optical Sensor
Sesi Pengajian	:	2008

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ABSTRACT

This PSM 1 report presents an investigation into the application of combination of laser and optical sensor to measure velocity of solid particle, flow in a conveying pipe. The merit of this method is, it can measure solid particle in a mixture with clear liquid. In order to measure velocity, two arrays of sensors are placed upstream and downstream on the pipe. The output of the downstream sensors will be replica of the upstream sensors. The sensor arrangement use is orthogonal. Output from both upstream and downstream sensors will be cross correlated. From the result of the cross-correlation, the peak of the cross correlation graph represented the time for the object to move from upstream to downstream. The velocity is obtained by simply dividing the time and the distance between upstream and downstream.

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ABSTRAK

Laporan PSM 1 ini membentangkan tentang pengunaan kombinasi pengesan optikal dan pemancar laser untuk mengukur halaju pepejal melalui satu paip penghantar. Matlamat kaedah ini ialah mengukur halaju aliran yang mengandungi campuran pepejal dan cecair tidak berwarna. Untuk mengukur halaju, dua pasang pengesan diletakkan di bahagian atas dan bawah paip. Keluaran dari pengesan bawah akan menjadi replika atau salinan tepat bagi pengesan atas. Keluaran dari kedua-dua pengesan atas dan bawah akan dikait silang. Dari keputusan kaitan silang, puncak bagi graf kaitan silang akan mewakili masa bagi objek tersebut untuk bergerak dari atas ke bawah. Halaju diperolehi dengan hanya membahagikan masa dan jarak di antara pengesan atas dan pengesan bawah.

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