ABSTRAK

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Program Studi	:	Teknik Mesin
Judul Skripsi	:	ANALISIS GETARAN PADA PELAT ALUMINIUM MENGGUNAKAN MPU6050 BERBASIS ARDUINO UNO

Kerusakan struktur berupa retakan pada pelat aluminium dapat memengaruhi karakteristik dinamis dan respons getaran sistem. Penelitian ini bertujuan menganalisis perbedaan respons getaran antara pelat aluminium utuh dan pelat retak menggunakan sensor MPU6050 berbasis Arduino Uno R3. Metode penelitian meliputi perancangan sistem akuisisi data, pemberian eksitasi berupa pukulan mekanik, serta analisis sinyal pada domain waktu dan frekuensi menggunakan Fast Fourier Transform (FFT). Hasil pengujian menunjukkan amplitudo pelat utuh sebesar 1,135 g dan pelat retak sebesar 1,623 g. Frekuensi dominan pelat utuh sekitar 28 Hz, sedangkan pelat retak sekitar 40 Hz. Perbedaan nilai frekuensi dan amplitudo tersebut menunjukkan bahwa metode analisis getaran efektif dalam mendeteksi perubahan kondisi struktur akibat retakan.

Kata Kunci: Analisis Getaran, Pelat Aluminium, Retakan Struktur, MPU6050, *Fast Fourier Transform (FFT)*.

ABSTRACT

Name	;	Mikael Arthur Labuhan Togatorop
Study Program	:	Mechanical Engineering
Title	:	VIBRATION ANALYSIS OF AN ALUMINUM PLATE USING MPU6050 ARDUINO UNO–BASED SYSTEM

Structural damage in the form of cracks in aluminum plates can affect the dynamic characteristics and vibration response of the system. This study aims to analyze the differences in vibration response between intact and cracked aluminum plates using an MPU6050 sensor based on Arduino Uno R3. The research method includes designing a data acquisition system, applying mechanical impact excitation, and analyzing the signal in both time and frequency domains using the Fast Fourier Transform (FFT). The experimental results show that the amplitude of the intact plate is 1.135 g, while the cracked plate reaches 1.623 g. The dominant frequency of the intact plate is approximately 28 Hz, whereas the cracked plate reaches approximately 40 Hz. The differences in frequency and amplitude values indicate that vibration analysis is effective in detecting structural condition changes due to cracks.

Keywords: Vibration Analysis, Aluminum Plate, Structural Crack, MPU6050, Fast Fourier Transform (FFT).