ABSTRACT

The train is a public transportation that is often used by the people of Indonesia. Trains are often also used for long trips such as the city of Solo to the city of Yogyakarta. One aspect that must be considered in train transportation is user convenience. One comfort that is often disrupted in trains is when a train travels uphill, turns and decreases. User comfort is one of the main evaluations for passenger vibration levels. Thus, the assessment of train passangers comfort is important to maintain and monitor the services offered by the railroad company. In addition, the provision of comfort levels on public transportation for passengers is one important measure to attract passengers. To find out this can be known through the IMU sensor on a smartphone. The Accelerometer sensor is used to get the X, Y, Z axis value, while the Gyscope sensor is used to stabilize the Accelerometer sensor value. GPS sensor is used to get train locations when inconvenience occurs. After that the sensors read and stored via a smartphone. The sensors will be filtered using a low-pass filter, a high-pass filter via a computer. The filtered sensor output results into comfort level data, and the data will be made into a Vibration map and fuzzy logic index.

Keywords : *IMU*, *Accelerometer*, *Gyroscope*, *low-pass* filters, *high-pass* filter, *Savitzky-Golay* filter, *pitch and roll* filter, *Fuzzy logic*.