

**Abstract**– In today's era of rapid economic growth, there is an increasing demand for workers to increase productivity by working longer and harder. However, these demands often lead to irregular and excessive working hours, which can potentially lead to negative consequences, such as physical fatigue—a state in which the body feels tired after physical activity. Factors that influence this fatigue include age, gender, health conditions, workload and work environment. Physical fatigue poses a significant challenge in ensuring workplace safety, especially in the transportation and industrial sectors, as it can reduce overall performance, productivity and quality of work. In addition, physical fatigue also increases the likelihood of decision-making errors and workplace accidents. Predicting physical fatigue is crucial to addressing these challenges. Heart rate serves as a parameter to measure fatigue, given its proven efficacy as a marker to predict physical fatigue, which is derived from the electrocardiogram and regulated by the autonomic nervous system. This research utilizes two machine learning algorithms - ARIMA and LSTM - with heart rate (bpm) and number of steps as variables. Performance evaluation, using Mean Squared Error (MSE) and Root Mean Squared Error (RMSE), showed that the LSTM model outperformed the ARIMA model. The LSTM model showed better performance, with MSE of 0.1108 and RMSE of 0.3329, compared to the ARIMA model with MSE of 0.2397 and RMSE of 0.4895.

**Keywords:** Autoregressive Integrated Moving Average; Long Short Term Memory; Heart Rate; Time series; Physical fatigue