Introduction

Indonesia has three climates namely sea, tropical and seasonal climate. This is because of Indonesia is located on and near equator. Since it is located

on and near equator, then it is clearly possible to get vulnerable to climate change [1], [2]. Climate change is a natural phenomenon which can affects many sectors in biological growth of plants and animalsinearth.Oneofthecausesofclimatechange

is air temperature [3]. Here, air temperature plays important role in various fields. For instances, it can be a factor of agricultural production because it affects the development and process of plant growth. Inthehealthsector,fluctuatingtemperaturescanalso cause various diseases. Moreover, high fluctuation of air temperature can also had an effect on the aviation sector on aircraft flight schedules [4]. Therefore, the need of predicting air temperature is important to help many sectors for Indonesia Government. In this research, the prediction of air temperature using machine learning approach will be elaborated. Sincethisapproachhavebeenappliedinmanyapplications and shown a robust approach for prediction problem (see [5], [6] for examples). Although some prediction methods based on time series data are available in some ilteratures (see [7]–[11] for more detail. Machine Learning has a basic definition of algorithms that process data, study the data, and apply what it has been learned to make decisions. The results of learning form machine learning will provide prediction results. While here, deep learning is part of machine learning which is designed to continuously analyze data with a logical structure. This can make deep learning is similar to human in making decisions. In order to achieve this ability, deep learning uses a layered algorithm structure called the artificial neural network (ANN). Therefore in this paper, the deep learning approach will be elaborated to approximate the air temperature in a local area in Indonesia. Here, Long Short-Term Memory (LSTM) approach will be used in this research. LSTM consist of Recurrent Neural Network (RNN) which issued with a special gating procedure, such that it can controls the access to memory cells [12]. The benefit of these properties is LSTM is able to process data into complex system and applications such as speech recognition [13], handwriting recognition [14], generating text [15], image-to-caption generation [16], and machine translation [17]. In this study, the air temperature forecasting system is developed using the LSTM model using

previous air temperature data. Furthermore, comparing the results obtained with the measurement data in the LIPI (Lembaga Ilmu Pengetahuan Indonesia) Weather Measurement Stations to get the best model by paying attention to the error rate of the value of RMSE (Root Mean Square Error) will be gained. Therefore, it is expected that the existence of this forecasting method provides a new way in the development of air temperature prediction model and can be used as the basis for the development of subsequent research.