

INTRODUCTION

Technological developments in the era of globalization have provided significant benefits in various social aspects. Human use of technology has become a necessity in everyday life, and many useful inventions have helped society in fields such as Agriculture, Education, Defense and Security. The changes that have occurred have had a big impact and many fields have recognized that technological advances have lightened the existing burden. However, it is important to remember that information technology cannot run alone without human resources who continue to develop it. Humans must be able to take advantage of existing technology and develop it into new technologies in the future. For example, in the field of Internet of Things (IoT).

Temperature is one of the main things that greatly affects the smooth running of daily activities. The higher the location of a place, the lower the air temperature. Based on the measurement results, the average rate of decline is 0.65 per 100 meter increase in height. Because air pressure increases the closer it is to the earth's surface, air molecules are concentrated near the earth's surface. The air molecules hold the 2 air molecules above it, so the pressure is greater. Meanwhile, radiation from the earth's surface will increase the intensity of collisions between air molecules, so that the temperature increases. Therefore, air molecules located near the earth's surface will receive radiation from the earth's surface which is greater than the air molecules above it [1]. At different heights in a building, of course, it has different humidity and temperature on each floor. This can happen because the further away a place is from the radiation released by the earth's surface, the temperature will decrease. Likewise with one of the buildings in Telkom University, namely the Telkom University Landmark Tower (TULT) building, each floor or different height will affect the humidity and temperature in the building.

Previous studies have examined various research methods for making predictions. One study shows that the various research methods have their own advantages for value prediction [2]. A method that can be used is polynomial regression. Polynomial regression is a special type of regression that works on the curvilinear relationship between dependent and independent values [3]. Polynomial Regression is a Linear Regression model formed by adding up the effect of each predictor variable (X) raised to the nth order [4]. Therefore, this research will predict different temperatures on each floor of TULT using the Polynomial Regression and IoT methods based on data taken from temperature measurements at TULT. Where the performance of polynomial regression if done separately has better results than when combined [5].

The primary focus of this research paper lies in the innovative implementation and assessment of the polynomial regression method, which proves to be an important technique for humidity and temperature forecast on TULT building at 1-minute intervals. Leveraging cutting-edge Internet of Things (IoT) platform, particularly the DHT22 sensor, the study directly captures accurate humidity and temperature data on the building. To ensure the reliability of the predictions, the polynomial regression method's performance is meticulously evaluated using two essential metrics: Mean Absolute Error (MAE) and Root Mean Square Error (RMSE). By striving for lower MAE and RMSE values, the paper establishes the method's exceptional precision when compared to actual measurements. The reported MAE and RMSE values for both the test and train sets underscore the method's efficacy and efficiency in temperature and humidity forecasting.

The organization of this paper is as follows. In Section I, readers are introduced to the research's background and related works, laying the groundwork for the study's significance. In Section II, the methodology and components used in the research are thoroughly explained, providing a clear and comprehensive view of the approach adopted. Section III presents the experimental results, including the calculated MAE and RMSE values. Finally, Section IV summarizes the paper's key findings.