



UNDERGRADUATE THESIS

FORECASTING RICE, COOKING OIL, AND EGG PRICES IN CPI AREAS OF EAST JAVA PROVINCE USING A HYBRID ARIMA-LSTM METHOD

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FACULTY OF COMPUTER SCIENCE
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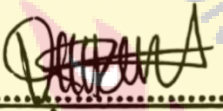
**FORECASTING RICE, COOKING OIL, AND EGG PRICES IN CPI
AREAS OF EAST JAVA PROVINCE USING A HYBRID ARIMA-LSTM
METHOD**

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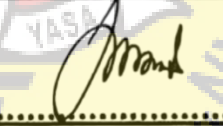
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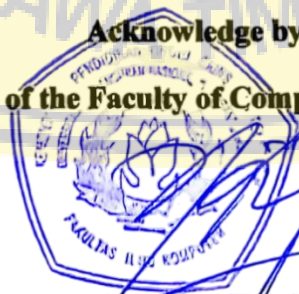


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STATEMENT OF ORIGINALITY

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Hereby declares that this undergraduate thesis contains no part of any other scientific work that has been submitted to obtain an academic degree at any higher education institution. Furthermore, it does not contain any work or opinions previously written or published by others, except for those which are explicitly cited in this thesis and listed completely in references.

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ABSTRACT

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Thesis Title: Forecasting Rice, Cooking Oil, and Egg Prices in CPI Areas of East Java Province Using a Hybrid ARIMA-LSTM Method
Supervisor: 1. Henni Endah Wahanani, ST. M.Kom.
2. Andreas Nugroho Sihananto, S.Kom., M.Kom.

Price instability and fluctuations of basic commodities in East Java pose a serious challenge, affecting public purchasing power and complicating government efforts to control inflation. This study proposes a Hybrid ARIMA–LSTM method using a decomposition approach to improve short-term price forecasting accuracy. In this approach, daily time-series data from the 2015–2024 period are decomposed into three components: the trend component is modeled using ARIMA, while the seasonal and residual components are modeled using LSTM. The model was evaluated on medium rice, bulk cooking oil, and purebred chicken eggs across three regions: Surabaya, Banyuwangi, and Madiun. The experimental results demonstrate that the best parameter combinations were achieved through p and q orders between 0–3 for ARIMA, alongside adjusted unit architectures and learning rates for LSTM based on the specific data characteristics of each region. Overall, the Hybrid ARIMA–LSTM method proves effective and yields higher accuracy for forecasting basic commodity prices compared to single models, despite requiring greater computational time.

Keywords: ARIMA, basic commodities, hybrid, LSTM, price forecasting

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2. Mrs. Fetty Tri Anggraeny, S.Kom. M.Kom. as the Coordinator of Informatics Study Program, Faculty of Computer Science, National Development University of East Java.
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The author realizes that in the preparation of the following thesis there are many shortcomings. For this reason, constructive criticism and suggestions from all parties are highly expected for the perfection of writing the following thesis. Finally, with all the limitations that the author has, hopefully the following report can be useful for all parties in general and the author in particular. The author also

hopes that this thesis proposal can contribute to the development of knowledge and serve as a reference for future research.

Surabaya, June 4th, 2026

Author

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