Abstract—In this digital era, a lot of information is scattered, and its quality cannot always be guaranteed to be credible and reliable. During the general election in Indonesia, which was widely discussed on Social Media X, people needed to understand and discern whether the information they encountered was true or a hoax. Therefore, this research developed an information credibility detection system that combined various technologies such as Bidirectional Gated Recurrent Unit (Bi-GRU) with TF-IDF as feature extraction, GloVe as feature expansion, and Firefly Algorithm (FA) as optimization. The dataset used consisted of 54766 Twitter data labelled as credible or non-credible, with a relatively equal amount of both. Preprocessing steps were performed to clean the data, and then the model was tested through a series of different experimental scenarios. The results of the experiments showed that the integration of these features significantly improved the accuracy of the model, especially when the model was optimized with FA. The model incorporating these features, with certain configurations such as test size, maximal features, n-gram type, and the use of a specific corpus, achieved a high accuracy of up to 90.28%, an increase of 14.07% from the baseline. This research confirms the efficiency of the proposed method in enhancing the quality of information credibility detection.