

ABSTRACT

The quality seed has a big impact on the plant's success and its ability to produce for a long time. As one of the stakeholders in Indonesia's ecosystem of agriculture, Balai Pengawasan dan Sertifikasi Benih Tanaman Pangan dan Hortikultura (BPSBTPH) West Java Province is responsible for implementing a certification program to identify high-quality seeds. High-quality seeds are pure and have viability, and the capacity to continue growing into healthy plants. These seeds can be categorized into normal seeds, abnormal seeds, fresh seeds, or dead seeds.

The certification program is still managed by a conventional strategy, absolutely depending on the knowledge and visual observations of staff who are professionals in the agricultural sector. Due to the limits of humans, this may result in conflicting observations. The staff at Balai lack experience in processing data based on technology, and there are currently no datasets available for rice seeds. However, this data can also be used to simulate the system process. The current process is not only slow but also lacks efficiency, and lacks timeliness. A system to make human activities easier is needed considering the fast-developing technology.

This research focuses on the performance of the rice seeds classification system design. The system design is based on deep learning methods using the VGG-GoogleNet architecture. The VGG-GoogleNet is VGGNet architecture modified with GoogleNet architecture was chosen to create and evaluate the new system. The datasets for testing system were taken exclusively under the guidance of staff in the BPSBTPH West Java Province's laboratory. The first simulation using the rice seed growth dataset gets an accuracy of 98.25%. The second simulation using dataset of the rice seed quality gets 94.99% accuracy and 99.30% accuracy using the Random Over Sampling technique for a balancing dataset.

Keywords: Deep Learning, Convolutional Neural Network, Rice Seeds, VGGNet, GoogleNet and Random Over Sampling.