Intrusion Detection System for AI Box Based on Machine Learning

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***Abstract*—This paper presents an integrated application of network intrusion detection. The intercepted packets are first analyzed using a machine learning algorithm, the HistGradient Boosting classifier, to detect network traffic as abnormal or normal. If the network traffic is unnatural or disruptive, the system will immediately notify the information security expert whether to disrupt the network traffic. We propose an information security application combined with hardware and software. The application system can secure IoT devices or any field that needs to use the network environment, including abnormal network traffic, system outages, betrayals, and other cyber threats. The system is scalable and can easily port to other devices or platforms. This study will introduce datasets and pre-processing methods, machine learning model building, abnormal packet handling, and operating system environment building of the AI BOX device. Two public datasets were used to train and test the model, and our model obtained 99.9% prediction accuracy. The system has been successfully tested on the Yocto Project operating system of the AI BOX device.**

***Keyword*—Artificial Intelligence, Confidentiality of Data Transfer, Feature Selection, HistGradient Boosting Classifier Algorithm, Information Security, IoT Device Security, Machine Learning, Packet Capture Analysis.**

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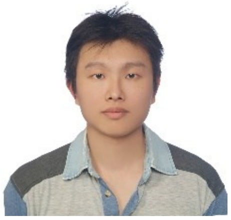

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