

ABSTRACT

In recent years, many innovations are made in communication technology. One of the innovation is Link Adaptation (LA) or Adaptive Modulation and Coding (AMC), a system that performed adaptive modulation scheme in which sets of modulation used by the same system adapted to the conditions of the transmission channel. Purpose of this research is to make an AMC system that can distinguish Amplitude Modulation (AM), Lower Sideband (LSB), Upper Sideband (USB), Binary Phase-shift Keying (BPSK), Quaternary Phase-shift Keying (QPSK), and 8-Phase-shift Keying (8PSK) modulation automatically. When the transmitter is freed from the used modulation, the receiver system must be able to know the type of modulation used by the transmitter in order to the demodulation process is properly. One of the systems that allowed the recipient the type of modulation used is Modulation Recognition Auto (AMC). AMC has an important role in the military. Modern electronic warfare, called the Electronic Warfare (EW) consists of three main components, these are Electronic Support (ES), Electronic Attack (EA) and Electronic Protect (EP). In electronic support, the main purpose is to collect the information of the received radio signal, so the AMC system can be used for this. With the AMC system, the modulation type is known to do the demodulation process, so the overlapped information can be known.

The feature extraction process is one of the most important processes in AMC System. A good feature can improve the classification performance of the received signal modulation. In this research, feature extraction performed is a high-order statistical feature in the time domain. The statistical order used is order 4. Information signals are passed on the transmission channel in the presence of AWGN noise interference with variable signal quality of 0 dB to 40 dB. Artificial neural network algorithm is used to classify modulation with a learning rate of 0.5 and the maximum number of epochs is 1000.

By using the 4th order statistical feature, the AMC system on this research can distinguish AM, LSB, USB, BPSK, QPSK, and 8PSK modulation. This research focus on modulation that is used in HF military radio. The accuracy rate of this system in performing modulation classification without using non-linear transformations is 65.5% on 10 dB signal quality. Then, the accuracy of AMC by using non-linear transformations on the received signal reaches 88.8% on the 10 dB signal quality. With these results it is expected that the AMC system can be used to improve the ability of the HF military radio

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