

## Comparison and Simulation of Digital Modulation Recognition Algorithms

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### **Abstract:**

Modulation recognition has been studied for decades with numerous amounts of papers published. Modulation classifiers are developed under assumptions and may not be robust in some applications. This paper studies and simulates several popular digital modulation recognition methods and discusses the pros and cons of those algorithms based on the robustness of the modulation feature and algorithm fundamentals. Many publications assume to have perfect knowledge of center frequency, baud rate, and pulse shape, but some publications assume less knowledge of the signal, so that the comparison of algorithms based solely on signal to noise ratio (SNR) and probability-of-success may have little value. To compare modulation recognition algorithms is not straightforward since algorithms are developed under different motivations and they are all good in solving certain problems. Modulation classifiers may be sensitive to center frequency offset, and pulse shaping, symbol or carrier timing, and sampling frequency. Hence, the assumptions, limitations, and the fundamental similarities and differences between the algorithms should be explored.