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Deep learning for automatic RF-modulation classification

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Classical methods use statistical-moments to determine the type of modulation in question. This essentially correct approach for discerning amplitude modulation (AM) from frequency modulation (FM), fails for more demanding cases such as AM vs. AM-LSB (lower side-band rejection) - radio signals being richer in information that statistical moments. Parameters with good discriminating power were selected in a data conditioning phase, and binary deep-learning classifiers were trained for AM-LSB vs. AM-USB, FM vs. AM, AM vs. AM-LSB, etc. The parameters were formed as features, from wave reconstruction primary parameters: rolling pedestal, amplitude, frequency and phase. Very encouraging results were obtained for AM-LSB vs. AM-USB with stochastic training, showing that this particularly difficult case (inaccessible with stochastic moments) is well solvable with multi-layer perceptron (MLP) neuromorphic software.

Summary

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