

# Reduced Match Filter for Time-Domain Pulse Shaping

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## I. ABSTRACT

In communication systems, digital signals are mapped to an analog waveform to be transmitted over the channel. The mapping process involves two steps:

- (i) Mapping source bits to symbols (also known as constellation points).
- (ii) Mapping these symbols to analog pulse trains and transmitting them after applying suitable passband modulation schemes.

At the receiver, the received signal (Transmitted signal + noise) is sent through a filter with its impulse response the same as the pulse shape, hence the term “matched” filter (this maximizes the SNR). This is followed by demodulation decoding to get back the Transmitted bits.

Nevertheless, a significant challenge for this technique’s practical implementation is its computational complexity for symbol detection that grows exponentially with the number of antennas. With evolving wireless communication technologies, the need to achieve substantially high spectral efficiency and stability has increased. But these features come with their own set of challenges like increased complexity and costs. The problem at hand then becomes to look for a reduced match filter for Time-domain pulse shaping. We aim to work on techniques to reduce the complexity of these matched filters at the receiver and implement the same in MATLAB.

## REFERENCES

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