Manual Overview

The following table shows the simulation properties that can be found on the Simulation Interface:

Property	Description
Channel Properties:	
Channel Type	$AWGN$ only or $AWGN$ with Fading.
Ts	Sample time of the input signal in second.
v	The receiver velocity in Km/hr.
En/Decoder Properties:	
Code Rate	The code rate of the convolutional coding scheme.
Memories	The number of memory elements in the encoder.
Decoding Type	Specifies the decoding type if it is HDD or SDD.
System Properties:	
Message Length	The length of the message in bits.
Iterations	The number of times the simulation send the k frames at each SNR value.
Minimum BER	The minimum BER that the simulation should reach before it stops.
Interleaver Type	The type of the used interleaver, it can be *None*, *Block* or *Pseudo-Random*.
Curve Options:	
Hold off	Use this option if you want to erase the old curve before another running.
Hold on	Use this option if you want to draw the follow curve on the previous one.
Markers Specifier	The markers specifiers of the used line while drawing the curve.
Demonstration:	
Out 1	Specifies the first output polynomial of the encoder.
Out 2	Specifies the second output polynomial of the encoder.
Out 3	Specifies the third output polynomial of the encoder.
Best Results:	
Out 1	Shows the first output polynomial of the **best** encoder
Out 2	Shows the second output polynomial of the **best** encoder
Out 3	Shows the third output polynomial of the **best** encoder
SNR at $1e-3$ BER	Shows the value of SNR at bit error rate equal to 10^{-3}
Simulation Time	Shows the elapsed simulation time in second.

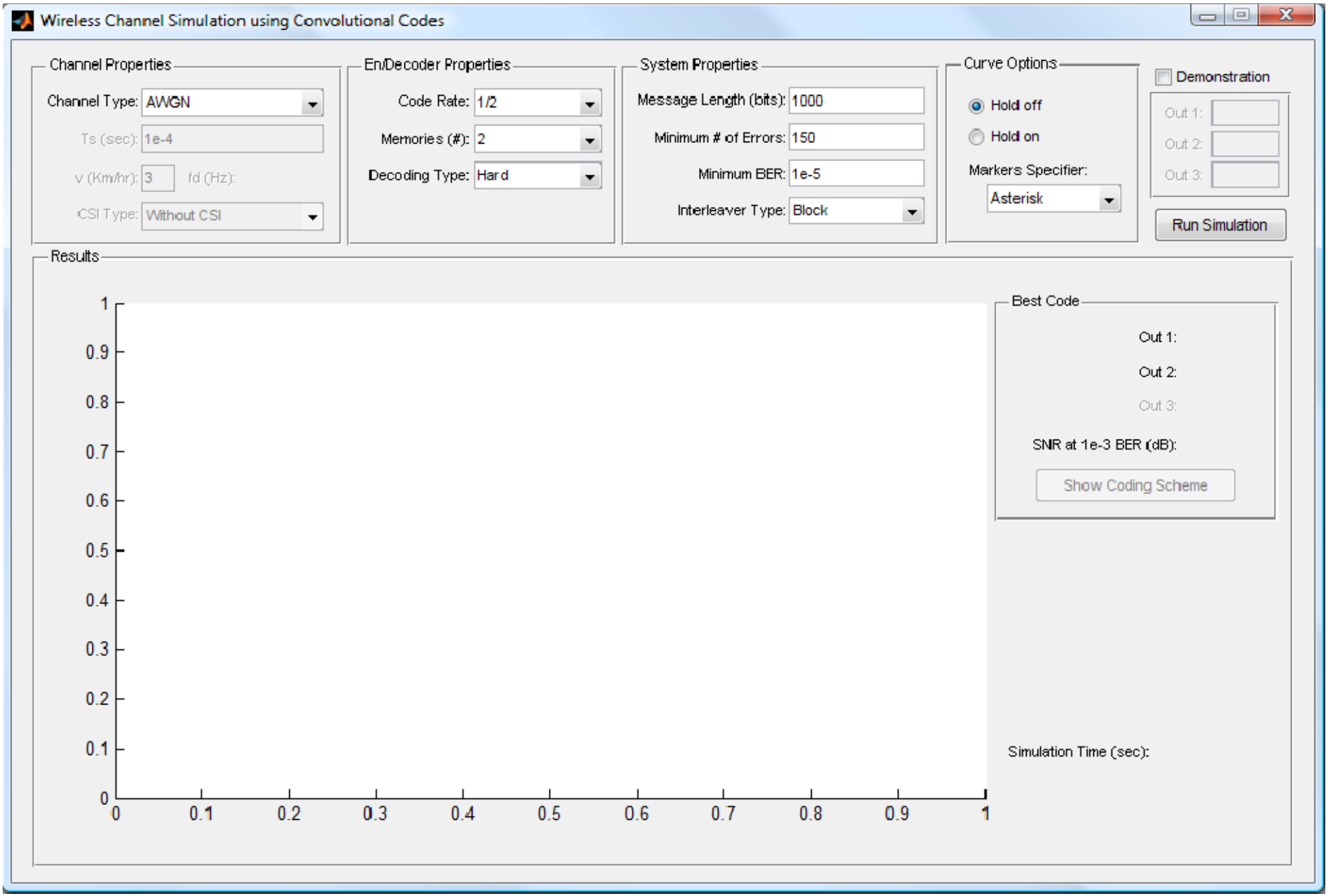
There are two running modes:

- Demonstration mode: users can run the simulation in demonstration mode by checking the "Demonstration" checkbox and provide values for "Out 1", "Out 2" and "Out 3" if necessarily. This mode allows users to get results for a given convolutional encoder polynomials.
- Automation mode: users can run the simulation in automation mode by unchecking the "Demonstration" checkbox. This mode allows users to run the simulation in a way to search for the best convulitional encoder for the given properties. Notice that the best convolutional encoder is has the minimum SNR at bit error rate equal to 10^{-3}.

When users run the simulation a **progress indicator** appears to show the users the simulation's progressing percentage. This indicator is calculated at runtime, this means that the percentage value is been calculated intelligently.

When the simulation finished the results appears in the appropriate boxes, a BER as a function to SNR curve is drawn and the "Show Coding Scheme" button is activated; clicking this button will sketch the encoder scheme. **Notice that the simulation is dynamic in a way that allows it to draw schemes for any obtained encoder polynomials.**

The following figure shows the simulation interface:


Wireless Channel Simulation using Convolutional Codes
Channel Properties
Channel Type: AWGN
Ts (sec): 1e-4
v (Km/hr): 3
fd (Hz):
CSI Type: Without CSI
En/Decoder Properties
Code Rate: 1/2
Memories (#): 2
Decoding Type: Hard
System Properties
Message Length (bits): 1000
Minimum # of Errors: 150
Minimum BER: 1e-5
Interleaver Type: Block
Curve Options
Hold off
Hold on
Markers Specifier:
Asterisk
Demonstration
Out 1:
Out 2:
Out 3:
Run Simulation
Results
1
0.9
0.8
0.7
0.6
0.5
0.4
0.3
0.2
0.1
0
0
0.1
0.2
0.3
0.4
0.5
0.6
0.7
0.8
0.9
1
Best Code
Out 1:
Out 2:
Out 3:
SNR at 1e-3 BER (dB):
Show Coding Scheme
Simulation Time (sec):