

Communication Systems Modeling with Simulink

Prerequisites

MATLAB Fundamentals, *Signal Processing with MATLAB*, and *Signal Processing with Simulink*, or working experience with MATLAB, Simulink, and DSP System Toolbox

Day 1 of 1

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| Amplitude Modulation Using Simulink | <p>Objective: Build an AM system to review basic concepts in Simulink.</p> <ul style="list-style-type: none">Building a simple AM model in SimulinkCreating a subsystemVisualizing a signal in the time and frequency domainsWorking with MATLAB dataSimulating the model from the command line |
| Modeling Using Communications System Toolbox | <p>Objective: Build an end-to-end QPSK model using Communications System Toolbox and become familiar with the different visualization tools within the toolbox.</p> <ul style="list-style-type: none">Exploring Communications System ToolboxCreating a QPSK transmitter modelGenerating a random sourceUsing frame-based processingVisualizing with scatter plots and eye diagramsCreating a QPSK receiver modelCalculating error rate statistics |
| Communication Systems Analysis | <p>Objective: Analyze the BER performance of an end-to-end communication system by writing a MATLAB script and using BERTool.</p> <ul style="list-style-type: none">Computing the BER curveAutomating performance analysis: scriptsAdding channel codingUsing BERTool for performance analysis |
| Channel Impairments and Receiver Algorithms | <p>Objective: Add channel impairments and recovery blocks to test receiver performance.</p> <ul style="list-style-type: none">Adding phase and frequency offsetCorrecting phase and frequency using DQPSKAdding timing offsetCorrecting for timing offsetModeling multi-path channel impairmentsUsing MATLAB code in the model for equalization |