

MATLAB App Designer

App Designer is an environment for building **MATLAB®** apps. It simplifies the process of laying out the visual components of a user interface. It includes a full set of standard user interface components, as well as a set of gauges, knobs, switches, and lamps to create control panels and human-machine interfaces.

More information about the supported UI components/Features:

URL: <https://www.mathworks.com/products/matlab/app-designer.html>

Screen for Transfer-Function Synthesis:

The screenshot shows the 'DSSynth Application' window with three tabs: 'Transfer-Function', 'State-Space', and 'Simulation'. The 'Transfer-Function' tab is active. It contains a 'Plant' section with input fields for 'Numerator' and 'Denominator'. To the right is an 'Implementation' section with two sliders: 'Integer' and 'Fractional', both ranging from 0 to 32. Below these is a 'Property' section with a checkbox for 'Stability'. At the bottom is a 'Synthesized Controller' section with input fields for 'Numerator' and 'Denominator'. Two buttons, 'Reset' and 'Synthesize', are located at the bottom right of the window.

Plant (transfer-function representation)

- Numerator: vector with the coefficients for numerator;
- Denominator: vector with the coefficients for denominator;

Implementation (fixed-point representation)

- Integer: value for the integer bits;
- Fractional: value for the fractional bits;

Property

- Stability: checkbox to select the property to be considered during the synthesization;

Synthesized Controller

- Numerator and Denominator for the controller after the synthesis.

Buttons:

- Reset: clear all fields fulfilled;
- Synthesize: perform the controller synthesis using DSSynth Tool;

Screen for State-Space Synthesis:

The screenshot shows the 'DSSynth Application' window with the 'State-Space' tab selected. The interface is divided into several sections:

- Plant:** Contains input fields for matrices A, B, C, and D, and an 'Inputs' field.
- Implementation:** Features two sliders: 'Integer' and 'Fractional', both ranging from 0 to 32.
- Property:** Includes checkboxes for 'Stability' and 'Safety', both of which are currently unchecked.
- Synthesized Controller:** Contains a single input field for the feedback matrix K.
- Buttons:** Located at the bottom right, there are 'Reset' and 'Synthesize' buttons.

Plant (state-space representation)

- A, B, C, D: matrices with the coefficients related to the plant;
- Inputs: vector with the inputs to be employed during the synthesis;

Implementation (fixed-point representation)

- Integer: value for the integer bits;
- Fractional: value for the fractional bits;

Property

- Stability/Safety: checkboxes to select the property to be considered during the synthesis;

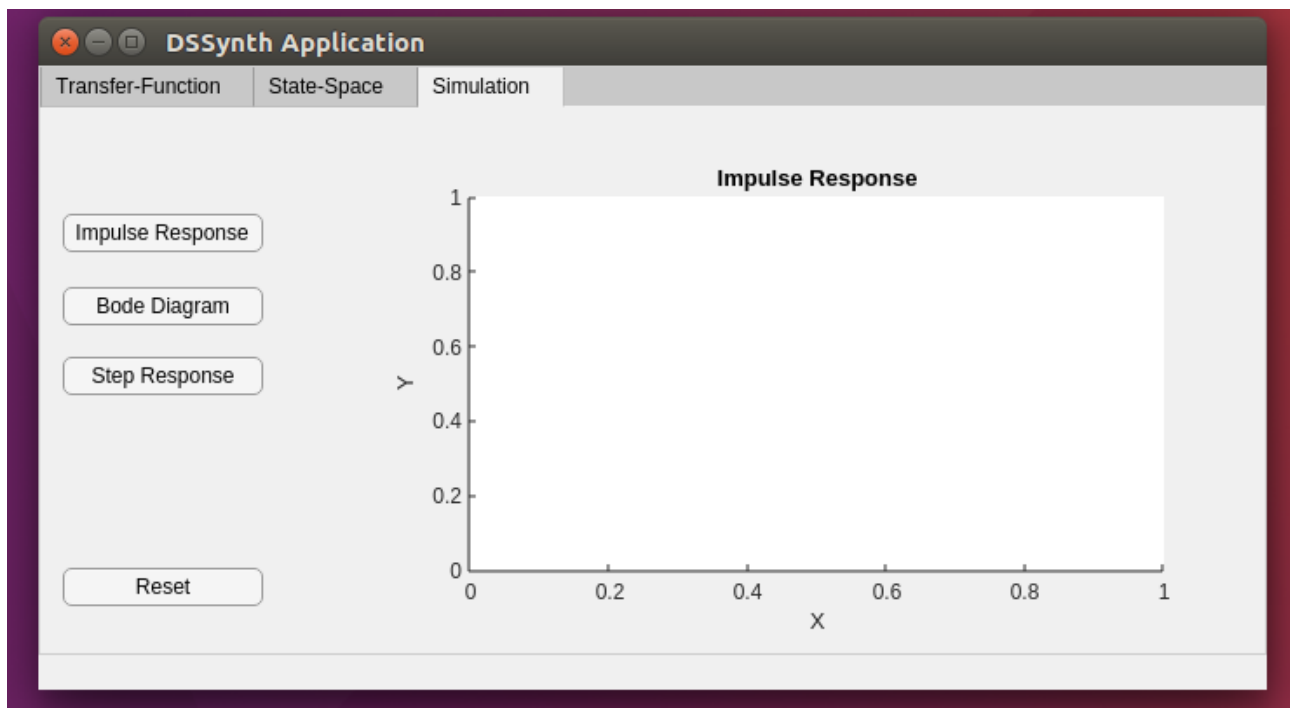
Synthesized Controller

- Feedback Matrix (Matrix K) after the synthesis.

Buttons:

- Reset: clear all fields fulfilled;
- Synthesize: perform the controller synthesis using DSSynth Tool;

Screen with Digital System Simulation:



Simulate the system in order to show graphically the synthesized controller:

- Impulse Response
- Bode Diagram
- Step Response