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Simulator of Link Budgets for Near Field Inductive Communication Systems

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in

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The appendix to the book is a set of matlab codes written by a PhD student (Mehrnoush Masihpour) to simulate aspects of Chapter 15 of the book. The names of the files provide a guide to what the ".m" files do. These files should be downloaded into your Matlab program path and used directly. The matlab codes consists of 7 main matlab routines which are

chainGUI.m
air.m;
Twograph.m;
minoo.m;
minooGUI.m;
NFMIC.m;
NFMICGUI.m

The files chainGUI.m, minooGUI and NFMICGUI.m are interfaces which allow the user to plot various graphs based on inputs via the user interface buttons. These interface files use the other matlab programs listed above for computation. Main computations are undertaken in air.m, Twograph.m and NFMIC.m.

chainGUI.m: This set of codes creates the home page, which is the graphical user interface that appears first when the program is run. This page includes the links to each sub-GUI page.

Twograph.m: when the first button at the home page is selected ("*comparison between antennas using air-cored and ferrite-cored coil"*), this file will be run. This creates a GUI page with no option of modifying system design parameters (fixed parameters) to show the achieved distance against different design parameters for both approaches of air and ferrite cored coils. When any of the options are selected within this page, the file "air.m" is called.

air.m: This file includes all the calculations required by the file 'Twograph.m'.

minooGUI.m: when the second button at the home page is selected ("*set the input to calculate the range and see the graphs"*), this file will be run. This creates a GUI page with the option of modifying system design parameters to show the achieved distance against different design parameters. When either of the buttons within this page is clicked on, the file 'minoo.m' is called.

minoo.m: This file includes all the calculations required by the file 'minooGUI.m'; such as the calculation of link budget for air and ferrite cored coil approaches.

NFMICGUI.m: When the Third button at the home page is selected ("*set the input to calculate the power at the receiver and see the graphs"*), this file will be run. This creates a GUI page with the option of modifying system design parameters to show the achieved received power against different design parameters and also to estimate the received signal power for the desirable set of parameters. When either of the buttons within this page is clicked on, the file 'NFMIC.m' is called.

NFMIC.m: This file includes all the calculations required by the file 'NFMICGUI.m'; such as the calculation of received power.

Usage

To use the codes, download them into matlab working directory or to a directory with the PATH to them appropriately set in Matlab. The codes are compatible with Matlab R2010b. They should work in later versions of Matlab but the authors cannot vouch for that.
These matlab codes may be developed further. Further development on the codes should be reported to the authors through this address. It is required that in using the codes, the book and codes are referenced properly in all publications in which they have been used and a copy of the enhanced codes sent to the authors at: Mehrnoush Masihpour (*mehrnoush.masihpour@student.uts.edu.au* *and* masihpour.mehrnoush@gmail.com) and
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We would be pleased to hear from you on what the codes are being used for. We are also interested to be notified of bugs and any fixes that you may found and undertaken in both the codes and the book chapters upon which they are based.