LTPDA Training Session 1

Introduction

This is the first in a planned series of training sessions on the use of LTPDA. The training session is organised as a set of topics which aim to introduce the participant to the use of LTPDA for standard signal processing. Each topic features an introductory presentation (~15 minutes) followed by a working session in which the participant can work through the associated examples and tasks. The intention is to have LTPDA experts on-hand to help with the worked examples. For this first training session, the aim is to have a mixture of examples and tasks to be carried out using both script and graphical programming.

Requirements

In order to participate fully in the training session, it is advisable to come equipped with a laptop with MATLAB installed. The LTPDA toolbox has the following requirements

MATLAB (R2008a or later)
Simulink
Signal Processing Toolbox
Symbolic Math Toolbox
Optimisation Toolbox

In addition, for those without access to a laptop, we plan to have a small number of machines configured with LTPDA. It may be that people will have to work in groups, depending on the number of attendees.

Agenda

Day 1

09:00 Featured presentation - Introduction to LTPDA [Martin]
09:30 Topic 1 [Martin]
11:00 Coffee break
11:15 Topic 1 continued
12:10 Featured presentation - GUIs in LTPDA [Nicola]
12:30 Lunch break
13:30 Topic 2 [Miquel]
15:00 Coffee break
15:15 Topic 3 [Michele]

17:00 Q/A session
18:00 Close

Day 2

09:00 Topic 4 [Anneke]
11:00 Coffee break
11:15 Topic 5 [Luigi]
12:30 Lunch break
13:30 Topic 6 [Mauro]
15:00 Coffee break
15:15 Topic 7 [Adrien]
17:00 Q/A session
18:00 Close

Topics

#	Topic	Description
1	Creating AOs and setting their properties. Viewing the data and the history.	This topic aims to introduce the various ways of creating Analysis Objects. In particular, the participant will learn how to create: 1. AOs containing simulated data 2. AOs from existing data files
2	Pre-processing of data	Various common signal processing tasks are addressed here: 1. Resampling time-series data 2. Interpolation 3. De-trending 4. Whitening 5. Data selection (split, select, find)
3	Operators	How to use the many AO operators. For example: 1. Arithmetic operators (+,-,*,/, etc) 2. Trigonometric operators (sin, cos, etc) 3. Statistical operators (mean, sum, median, etc) 4. Misc (sqrt, real, imag, abs, etc)
4	Pole/zero models	Creating, viewing and using pole/zero models in LTPDA.
5	Digital filtering	How to use the two LTPDA filter classes (mfir, miir) to create digital filters and apply these to data.

#	Topic	Description
6	Spectral analysis	LTPDA contains various spectral analysis algorithms for computing: 1. Power Spectral Density estimates 2. Cross-power spectra 3. Coherence estimates 4. Transfer function estimates
7	State-space modelling	How to use the state-space modelling class of LTPDA to build systems, simulate data, extract transfer functions, etc.