

## MM3: SENSTOOLS for parameter estimation

- ✓ Senstools is a collection of Matlab programs, implementing the sensitivity approach for direct parameter estimation, experiment design and model validation.
- ✓ The programs may conveniently be organized as a Matlab Toolbox
- ✓ All the user has to program is the simulation program for his particular process
- ✓ The programs are organized as main programs (script files) calling sub programs (functions) and using data (mat-files)

## Name conventions

- ✓ The program and data file names contain information of the program type and of the actual process name. The initial letters designate the type:
  - main     main program (script file)
  - sim      simulation of process (function file)
  - meas     input/output measurement data (mat-file)
  - prog     program data. progdata (mat-file) are created by progprog (program data program, script file).
- ✓ Names of files being particular for a certain process will contain the process name.  
Example: process = `motor'   simmotor.m and measmotor.mat
- ✓ Program names also contain information of the function  
Example: mainest.m. (main program for estimation)

# Procedure for parameter estimation

For a process named *xxx*:

**1. Make the simulation program** as a Matlab function:  $y = \text{simxxx}(u,t,\text{par})$

**2. Save the *measured data***  $t$ ,  $u$  and  $y$

```
>> save measxxx t u y % creates measxxx.mat
```

**3. Enter required *program data***

This can be done in 3 different ways:

a) Entering the values in the work space one by one.

```
>> process='xxx';
```

```
>> par0=[1 2];
```

b) Loading a mat-file (progdataxxx.mat) with the required program data values. (Automatically if a progdata-file for the particular process exists. The progdata-file is created and saved by a progprogxxx.m file.

c) Using default values specified in the main programs

(If the progdata are not in the work space and there is no progdata.mat)

**4. Run the main program *mainest.m*** for parameter estimation

```
>> mainest
```

# Læringsstile (learning styles)

4 dimensioner med to alternativer i hver:

## 1. Informationskanal:

*Visuel:* figurer, diagrammer, billeder

*Verbal:* ord i tekst eller tale

## 2. Informationsbehandling:

*Aktiv:* lærer ved at bruge informationen f. eks. i opgaver, projekter eller diskussioner

*Reflekterende:* tænker og prøver at opnå forståelse

## 3. Opfattelse:

*Sansning:* konkrete data og facts

*Intuition:* teorier og fortolkninger af information

## 4. Forståelse:

*Sekventiel:* forståelsen opbygges skridt for skridt

*Global:* ønsker overblik/overordnet forståelse inden detaljerne (top-down)