

ONLINE-SVR INTERFACE MANUAL

INTRODUCTION

This is a quick tutorial that explains how to use OnlineSVR Interface. Before use it, is useful understand how support vector machines works. Some papers are aviables in the theory section of the site.

REQUIREMENTS

This program is developed with Visual Studio .NET 2005. To use it you need:

- Windows Operating System
- Visual Studio Framework 2.0 or above

MAIN WINDOW

The screenshot shows a software window titled "ONLINE SUPPORT VECTOR REGRESSION". The interface is divided into several sections:

- PARAMETERS:** A section with five input fields: Epsilon (0.1), C (1), KernelType (RBF), KernelParam (30), and Error Toller. (Auto).
- TRAINING SET (0):** A section with three input fields: Min Error (0), Mean Error (0), and Max Error (0).
- TEST SET (0):** A section with three input fields: Min Error (0), Mean Error (0), and Max Error (0).
- TRAINING SET | TRAINING ERROR | TEST ERROR:** A graph area with a y-axis from 0 to 10 and an x-axis with labels "SUPPORT (0)", "ERROR (0)", and "REMAINING (0)".
- Buttons:** A row of three buttons: "NEW", "LOAD", and "SAVE". Below them are two larger buttons: "DATA SET" and "TRAIN".
- Status Bar:** A bar at the bottom with the text "Changed Epsilon".

PARAMETERS

In top-left part of the program there is the parameters area. Here you can change all OnlineSVR parameters. When a parameter change, "Train" button will be enabled; in this way you can update changes.

PARAMETERS	
Epsilon	0.1
C	1
Kernel Type	RBF
KernelParam	30
Error Toller.	Auto

TIP: to have a quick description of the current kernel type, click on light-blue caption "KernelType" and in the progress bar will be shown some kernel details.

TRAINING & TEST SET ERROR INFORMATIONS

Here you can see minimum, average and maximum error done by OnlineSVR with current parameters. The number near set name is the set elements number.

TRAINING SET (57)	
Min Error	0.00200629
Mean Error	0.03954203
Max Error	0.15214219

TEST SET (24)	
Min Error	0.00256893
Mean Error	0.03466093
Max Error	0.05502498

PLOTS

These plots shown results of training.

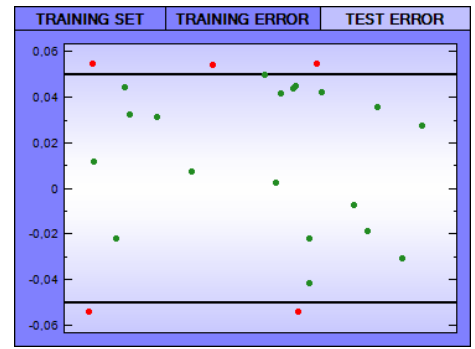
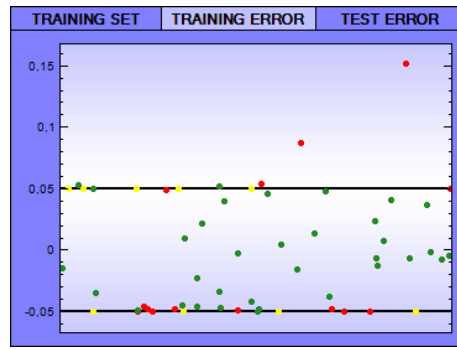
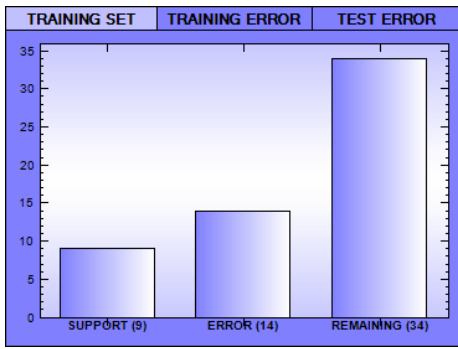
In first plot is visible the elements number of each sample (support, error or remaining).

In second plot there are OnlineSVR errors compared to real solution.

The yellow points are samples contained into support set, the red-ones into error set and the green-ones in the remaining set. The two lines shown error tolerance (epsilon).

Last plot describes errors of test set. This plot is the more indicated to evaluate the quality of solution.

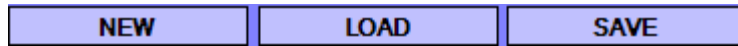
The green points are correct samples and the red-ones are errors.



FILES

These commands are useful to save/load OnlineSVRs:

- New: build a new OnlineSVR
- Load: open an existing OnlineSVR
- Save: save the current OnlineSVR



LEARNING

The heart of OnlineSVR functions are contained into these 2 commands:

- DataSet: manage training and test set (see the DataSet chapter for more info)
- Train: trains the OnlineSVR with the current parameters and training samples. It's disabled until some parameter is changed or some sample is added/removed from the training set.



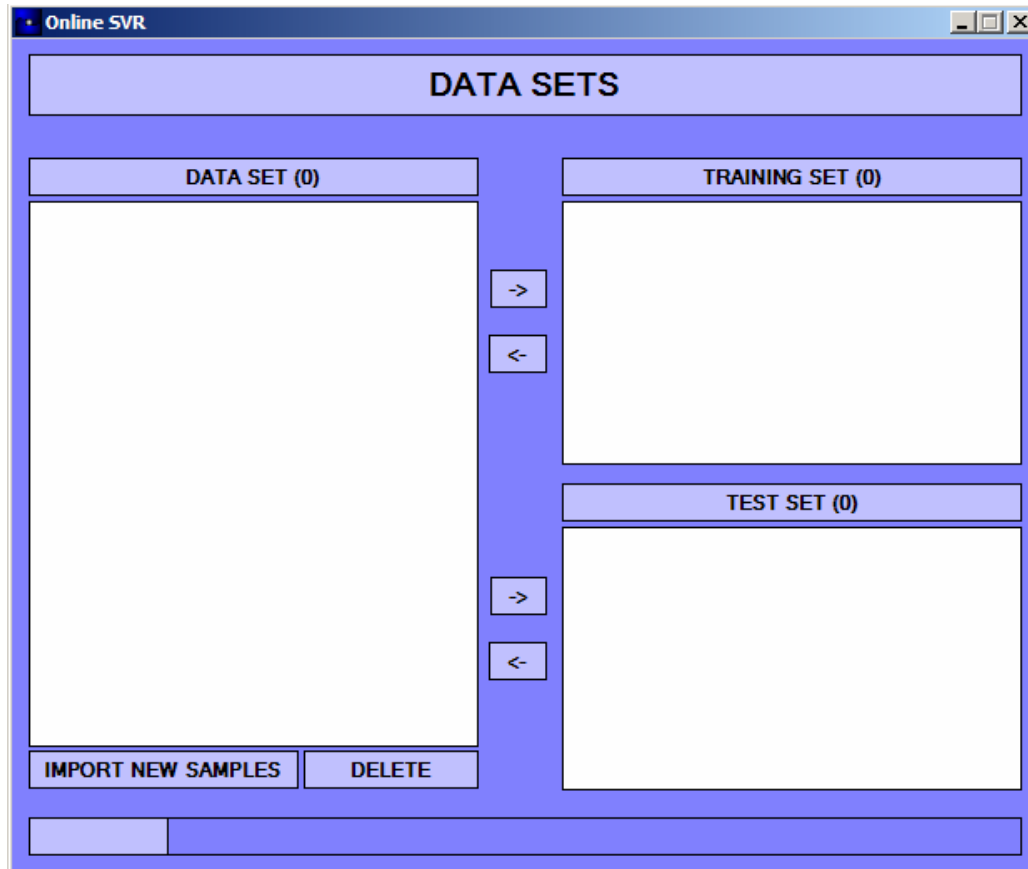
PROGRESS BAR

It has two functions:

- When the machine is training, the bar is moving.
- It displays useful messages



DATASET WINDOW



- To import new samples, click on

IMPORT NEW SAMPLES

- After you have imported the samples, you can move them from a set to another with arrows:

DATA SET (988)				TRAINING SET (5)		
1.	X=(0.4163531061)	Y=-0.8531209171		1.	X=(0.4557259623)	Y=-0.9879915523
2.	X=(0.0940348690)	Y=0.8077637043		2.	X=(0.4699778669)	Y=-0.9999204911
3.	X=(0.8691524256)	Y=0.6692906785	>	3.	X=(0.2527836511)	Y=0.5759421268
4.	X=(0.3916172227)	Y=-0.6994156516	<	4.	X=(0.4499464539)	Y=-0.9774171047
5.	X=(0.5421873973)	Y=-0.7586974746		5.	X=(0.1568348651)	Y=0.9999970044
6.	X=(0.8630868922)	Y=0.7130991966				
7.	X=(0.8551969697)	Y=0.7661367636				
8.	X=(0.4722556826)	Y=-0.9999483079				
9.	X=(0.7869243897)	Y=0.9998835339				
10.	X=(0.6559821383)	Y=0.273121173				
11.	X=(0.0000398896)	Y=0.000398896				
12.	X=(0.1312371618)	Y=0.9667937555				

TIP: to select more samples, you can use "Control" and "Shift" keyboard keys.

- To exit from the DataSet Windows, you can press "ESC" key or click on 