
Scilab Cloud

Deploy
algorithms



Scilab – Highlights

- Scilab[®] is competitive with Matlab[®], but **open-source** and **free**
Scilab[®] Xcos is an alternative to Simulink[®] for control systems simulation
- Scilab has a **1M+ user** community worldwide
- **Scilab Cloud** enables the deployment of scientific applications
- The Scilab Team joined **ESI Group** in February 2017

Scilab – What do we offer

- **Professional services**

Development of applications leveraging Scilab, Scilab training, Scilab support

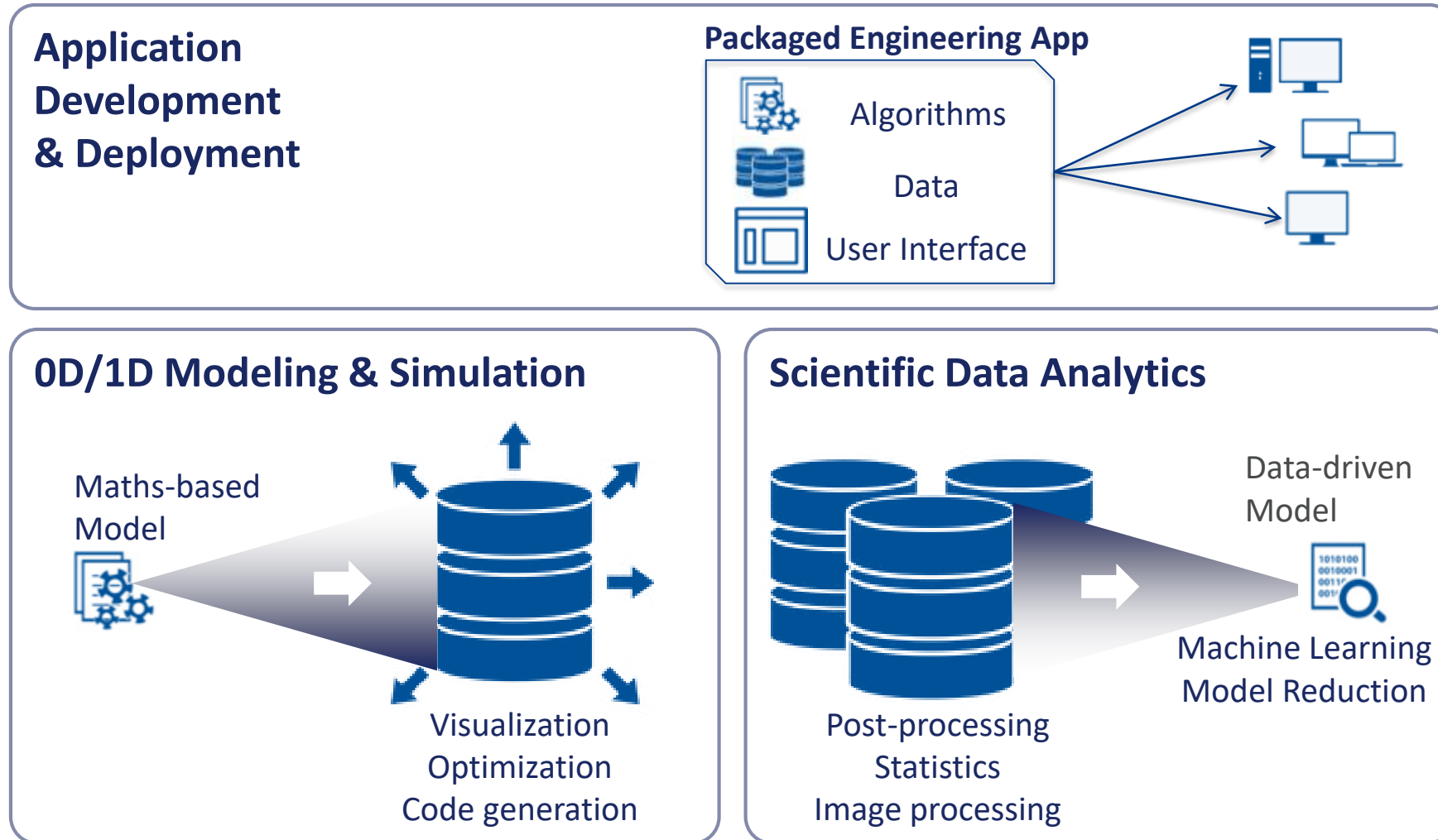
- **Cloud services**

Scilab Cloud for the deployment of applications (on-premises/private or public cloud)

- **Software solutions**

Offerings which extend the power of existing ESI software with Scilab & Scilab Cloud (Pre/post-processing, coupling with third-party simulation codes, simple apps..)

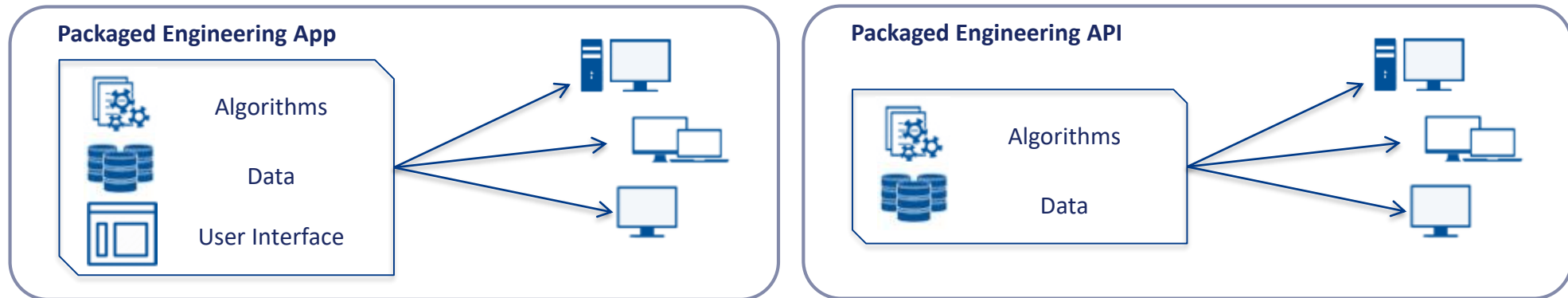
Scilab functional overview



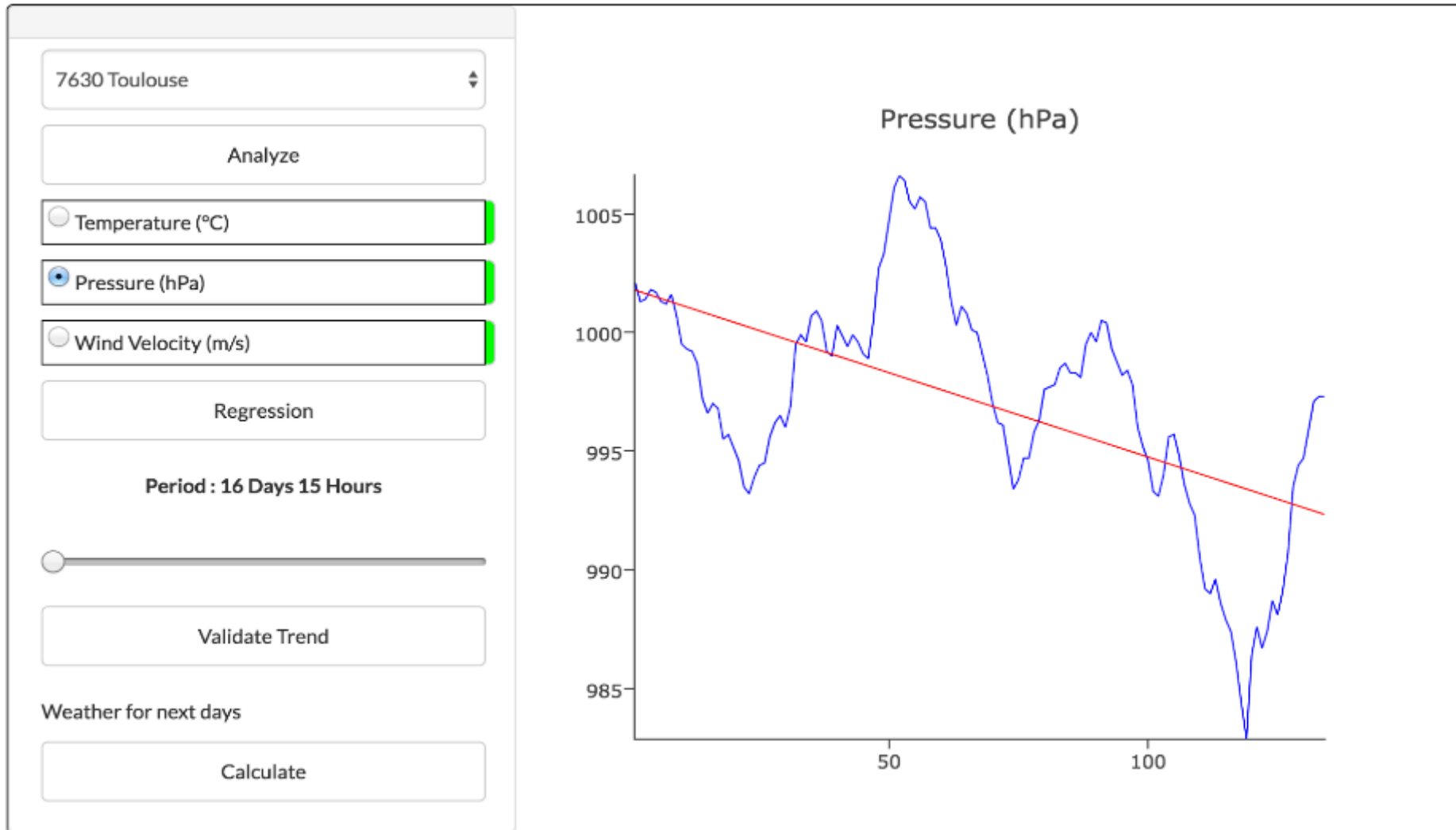


Hands-on demonstration

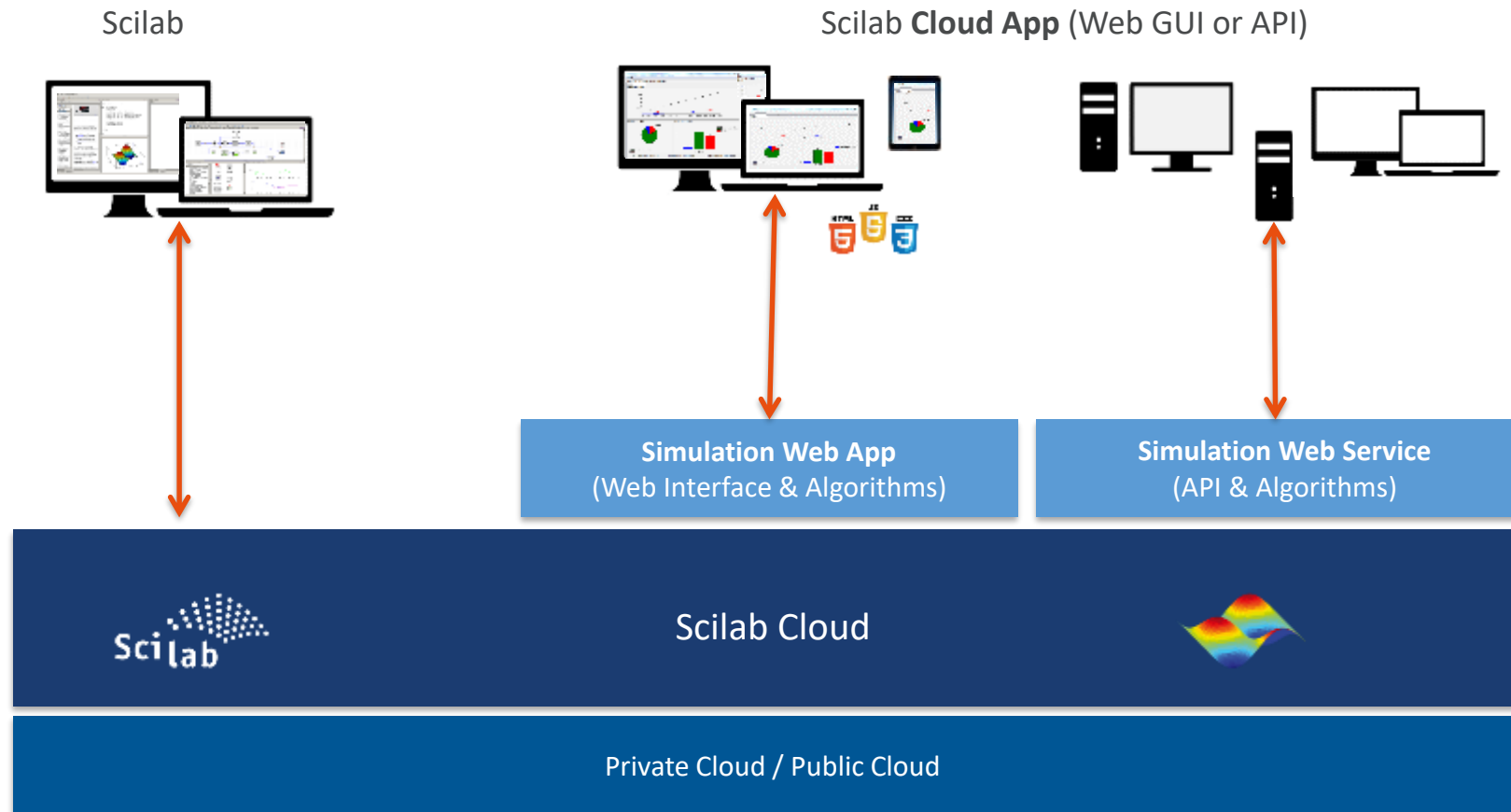
Weather application & algorithms



Application deployment



Scilab Cloud Overview

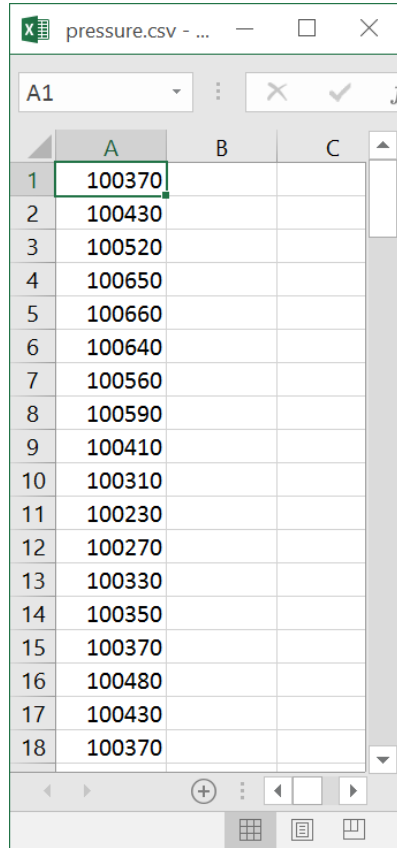


Develop a function in Scilab

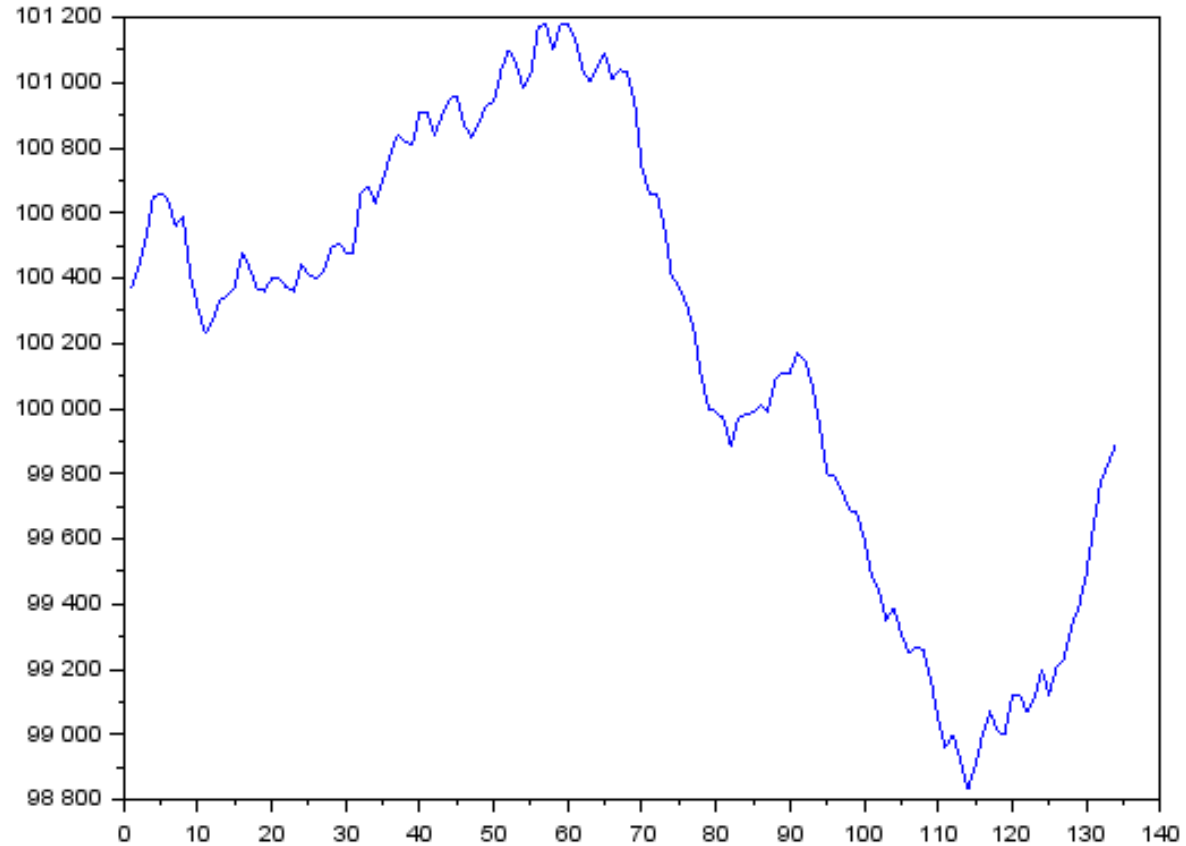
In your desktop environment



Import Local Data

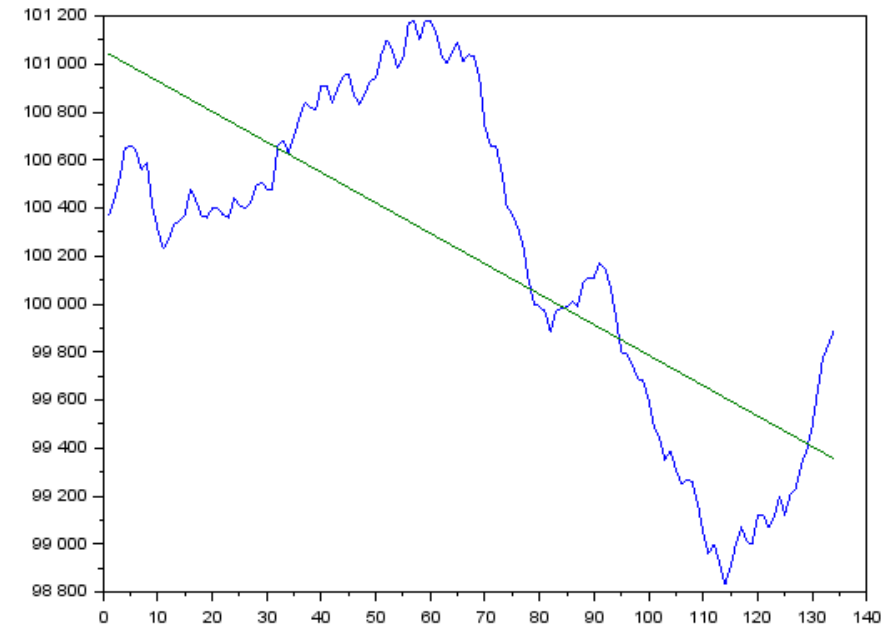


| | A | B | C |
|----|--------|---|---|
| 1 | 100370 | | |
| 2 | 100430 | | |
| 3 | 100520 | | |
| 4 | 100650 | | |
| 5 | 100660 | | |
| 6 | 100640 | | |
| 7 | 100560 | | |
| 8 | 100590 | | |
| 9 | 100410 | | |
| 10 | 100310 | | |
| 11 | 100230 | | |
| 12 | 100270 | | |
| 13 | 100330 | | |
| 14 | 100350 | | |
| 15 | 100370 | | |
| 16 | 100480 | | |
| 17 | 100430 | | |
| 18 | 100370 | | |



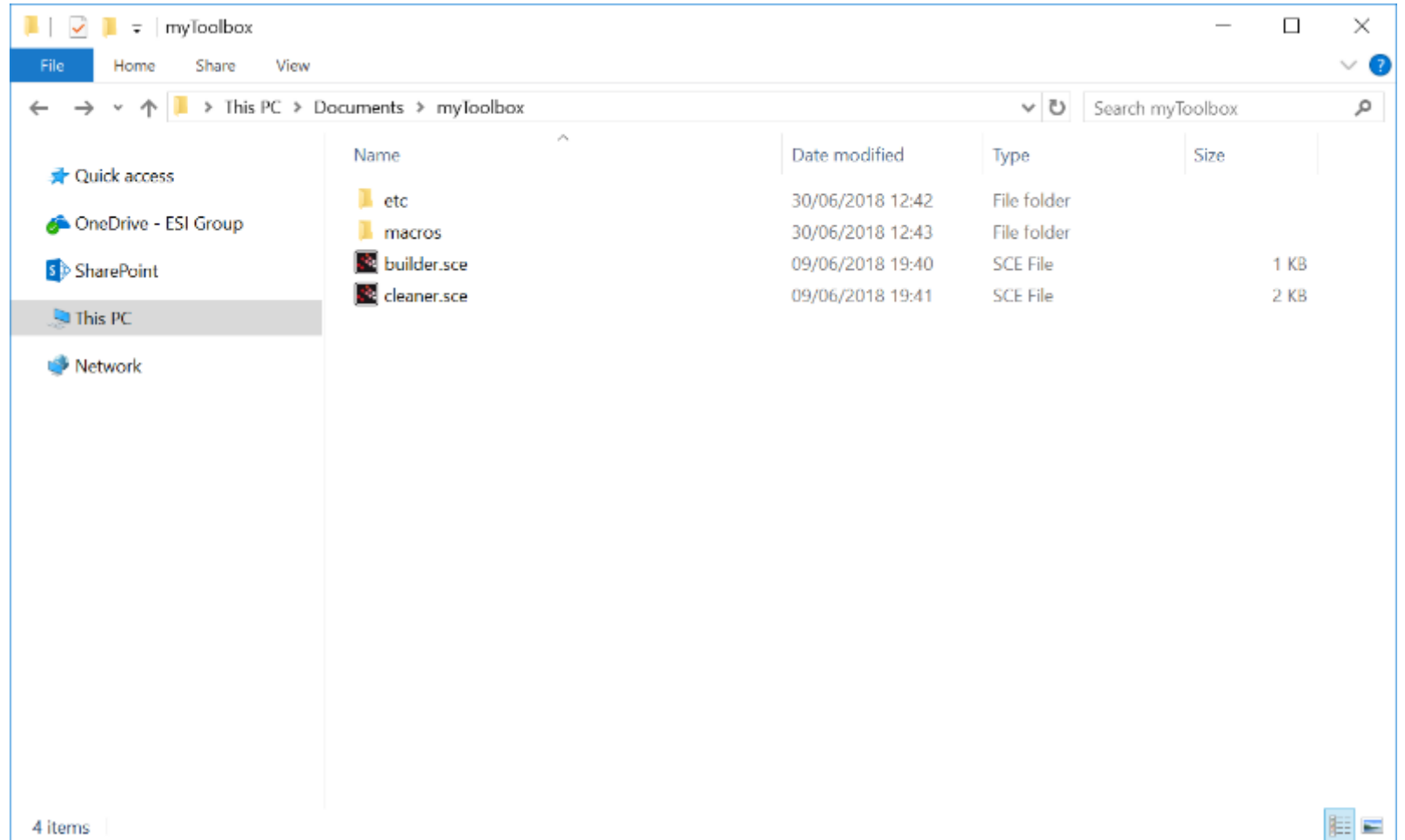
Write a Scilab function

```
testAPI.sce (C:\Users\ydb\Google Drive\Scilab Cloud API\Gspreadsheet\NewRegRv3\te... - □ ×
Fichier Édition Format Options Fenêtre Exécuter ?
testAPI.sce (C:\Users\ydb\Google Drive\Scilab Cloud API\Gspreadsheet\NewRegRv3\test\testAPI.sce) - SciNotes
regress_lin.sci
1 function out = regress_lin(y)
2 .....
3 ey = y;
4 if size(ey) (1) ~= 1 then
5 ..... ey = ey';
6 end
7 ex = [0:length(ey)-1];
8 [a, b, sig] = reglin(ex, ey);
9 out = a * ex + b * ones(size(ey) (1), size(ey) (2));
10 .....
11 endfunction
12
```



Package your functions in a toolbox

- etc/
 - myToolbox.quit
 - myToolbox.start
- macros/
 - buildmacros.sce
 - myFirstFunction.sci
- builder.sce
- cleaner.sce



Deploy a web services with Scilab Cloud

In your cloud administration





Home < ⚙️

Settings

- User Profile
- User Detail
- Password Management
- Groups & Access
- Data Management
- Administration Tools
- Groups
- Users
- Applications
- Web Services

> Web Services management

</> Testapi (Scilab) ▾

Production version

| Active | Name | Upload Date (GMT) | Compilation log | Source | Build Status | Routes | Settings | Delete |
|----------------------------------|------------|---------------------|-----------------|--------|--------------|--------|----------|--------|
| <input type="radio"/> | test | 2017/07/02 21:45:11 | | file | ✓ | 1/1 | | |
| <input type="radio"/> | AirLiquide | 2017/07/03 09:28:09 | | file | ✓ | 2/2 | | |
| <input checked="" type="radio"/> | master | 2018/06/08 20:13:31 | | git | ✓ | 9/9 | | |

Add a new production version

Name

From

API functions



Home < ⚙️
Settings

- User Profile
- User Detail
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- Users
- Applications
- Web Services

Development version

| URI | Name | Upload Date (GMT) | Compilation log | Source | Build Status | Delete | Update | Online |
|----------------------|--------------------|---------------------|-----------------|--------|--------------|--------|--------|--------|
| /32/ | RegR | 2017/06/30 08:57:39 | | file | ✓ | | | |
| /35/ | NewRegR | 2017/06/30 14:40:58 | | file | ✓ | | | |
| /36/ | NewRegRv2 | 2017/07/01 11:06:05 | | file | ✓ | | | |
| /72/ | SignalAPIv1 | 2018/07/15 16:48:12 | | file | ✓ | | | |
| /76/ | SignalAPIv2 | 2018/07/15 19:13:28 | | file | ✓ | | | |
| /77/ | SignalAPIv3 | 2018/07/15 19:18:21 | | file | ✓ | | | |
| /78/ | ArcTrackingAPIv1 | 2018/07/16 09:33:10 | | file | ✓ | | | |
| /79/ | ArcTrackingAPIv1.1 | 2018/07/16 10:09:08 | | file | ✓ | | | |
| /80/ | ArcTrackingAPIv1.2 | 2018/07/16 10:39:38 | | file | ✓ | | | |
| /81/ | SignalAPIv4 | 2018/07/16 12:28:14 | | file | ✓ | | | |
| /82/ | xcos simu | 2018/07/16 20:01:53 | | file | ✓ | | | |
| /84/ | NewRegv3 | 2018/07/17 09:25:45 | | file | ✓ | | | |

Add a new development version

From

Archive

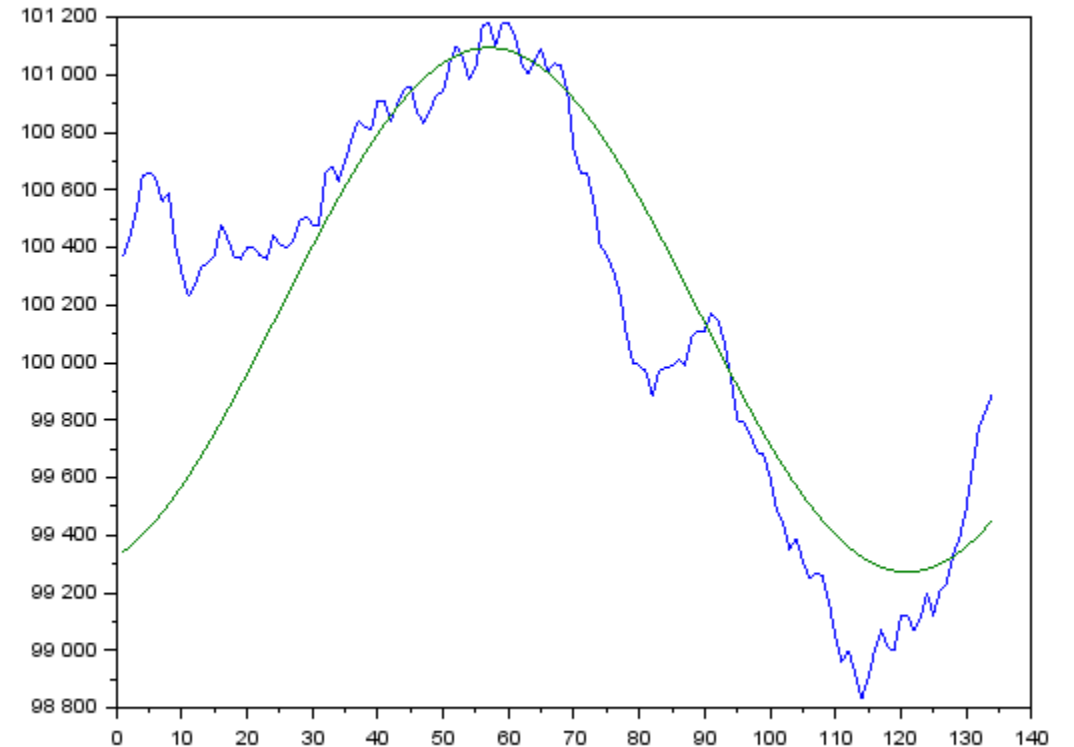
Git

Weather API

Demonstration 1

Adding a new function to the API

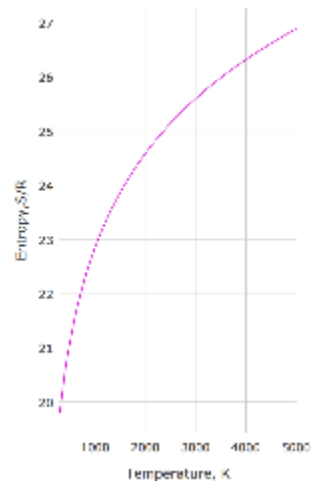
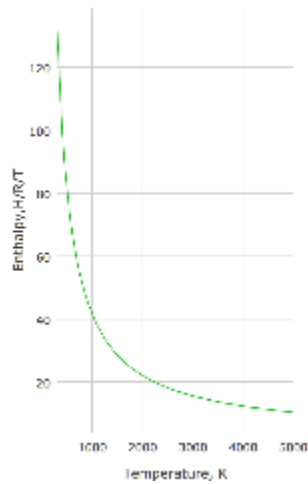
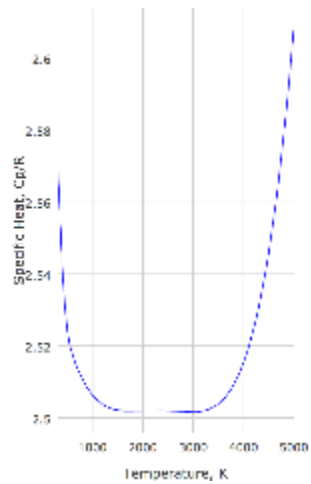
```
url_fft="https://scilab.cloud/rest/scilab/testapi/83/fftOnDat";  
A=csvRead('sensor-data.csv');  
L=list(A(:,12));  
data1.inputs=L;  
data1.token=token;  
tic();out=http_post(url_fft, data1),toc()  
L=[1:134]'; plot(L,[A(:,12) out.outputs'])
```



Chemkin Thermodynamic database interpolated by NASA polynomials

Demonstration 2

Description of the algorithms

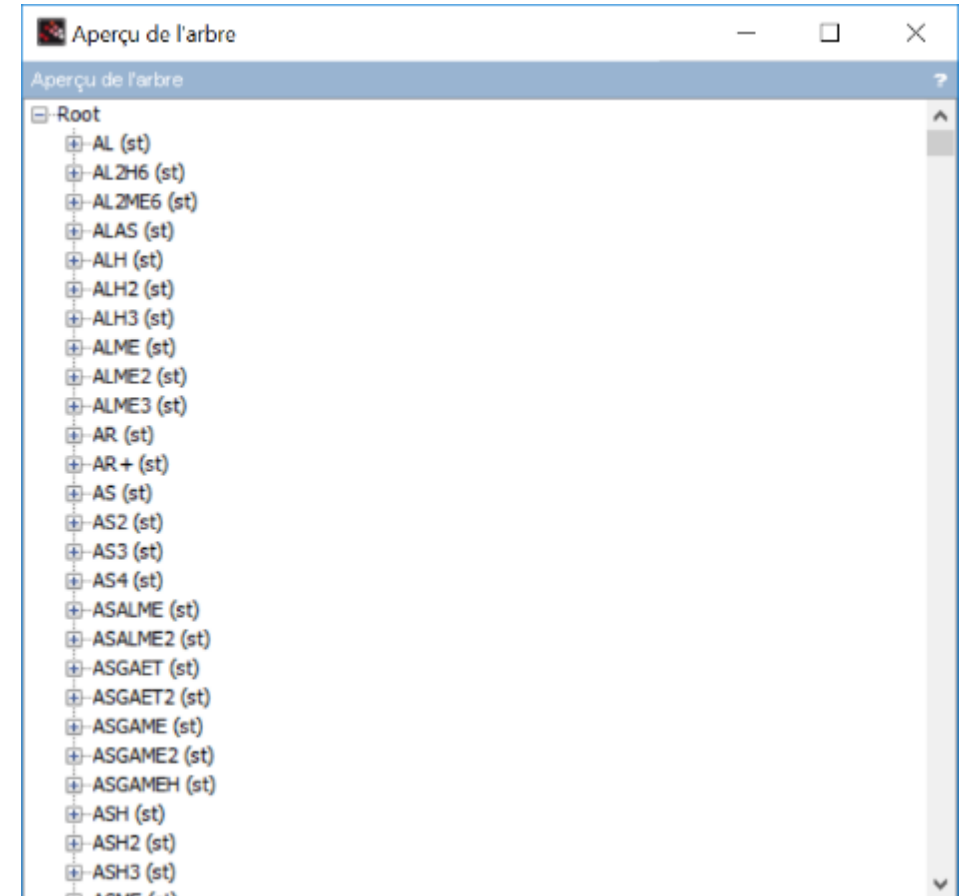
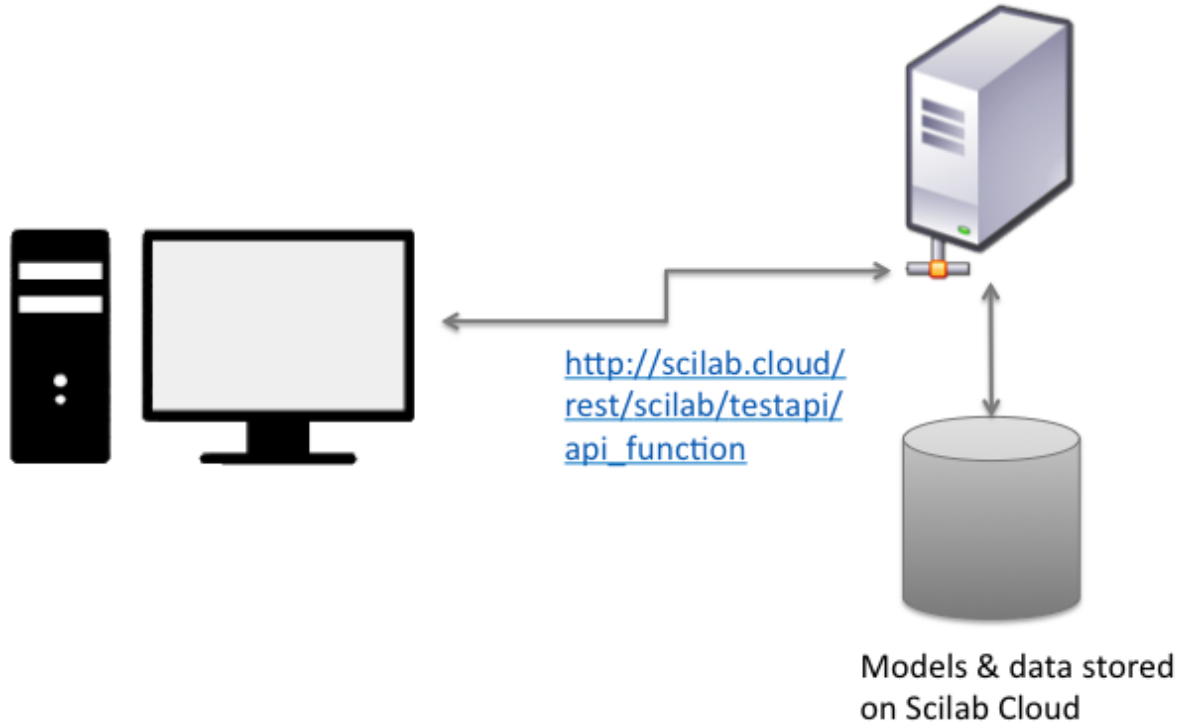


$$\frac{C_p}{R} = a_1 + a_2T + a_3T^2 + a_4T^3 + a_5T^4$$

$$\frac{H^0}{RT} = a_1 + \frac{a_2}{2}T + \frac{a_3}{3}T^2 + \frac{a_4}{4}T^3 + \frac{a_5}{5}T^4 + \frac{a_6}{T}$$

$$\frac{S^0}{R} = a_1 \ln T + a_2T + \frac{a_3}{2}T^2 + \frac{a_4}{3}T^3 + \frac{a_5}{4}T^4 + a_7$$

Description of the database



dev.scilab.cloud

scilab.cloud

Authentication

Select a symbol

T° start

T° step

T° end

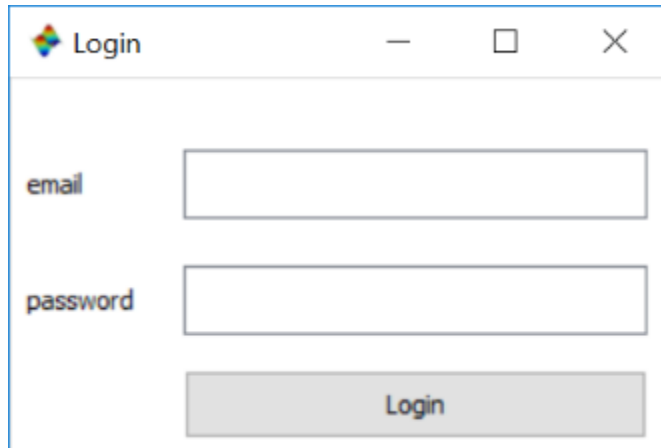
Inputs

```
{
  "inputs": [
    [
      "therm.sod"
    ],
    [
      "AL"
    ],
  ]
}
```

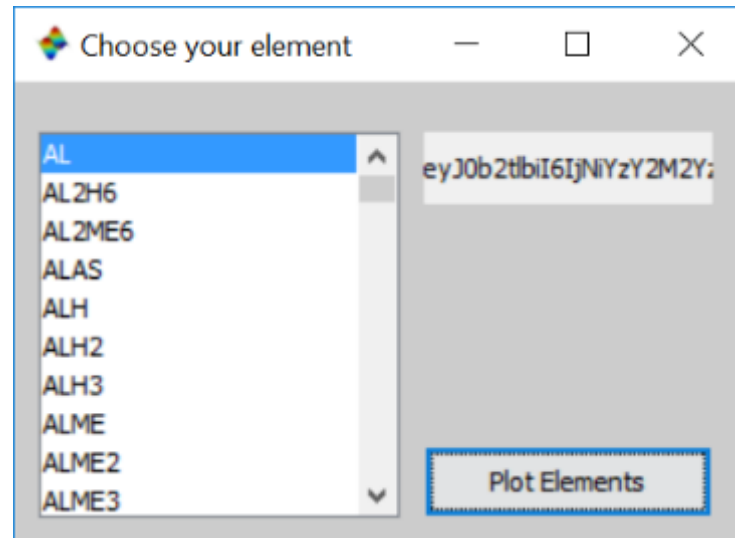
Outputs

```
[
  [
    2.5720362471,
    132.20878365420333,
    19.796057779225958
  ],
  [
    2.55445198063125
  ]
]
```

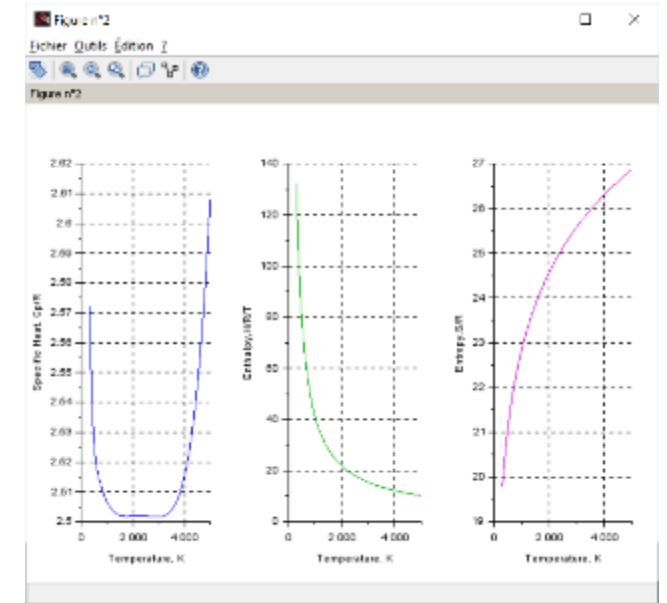
Connected desktop app



A window titled "Login" with a standard Windows title bar. It contains two input fields: "email" and "password". Below the "password" field is a "Login" button.



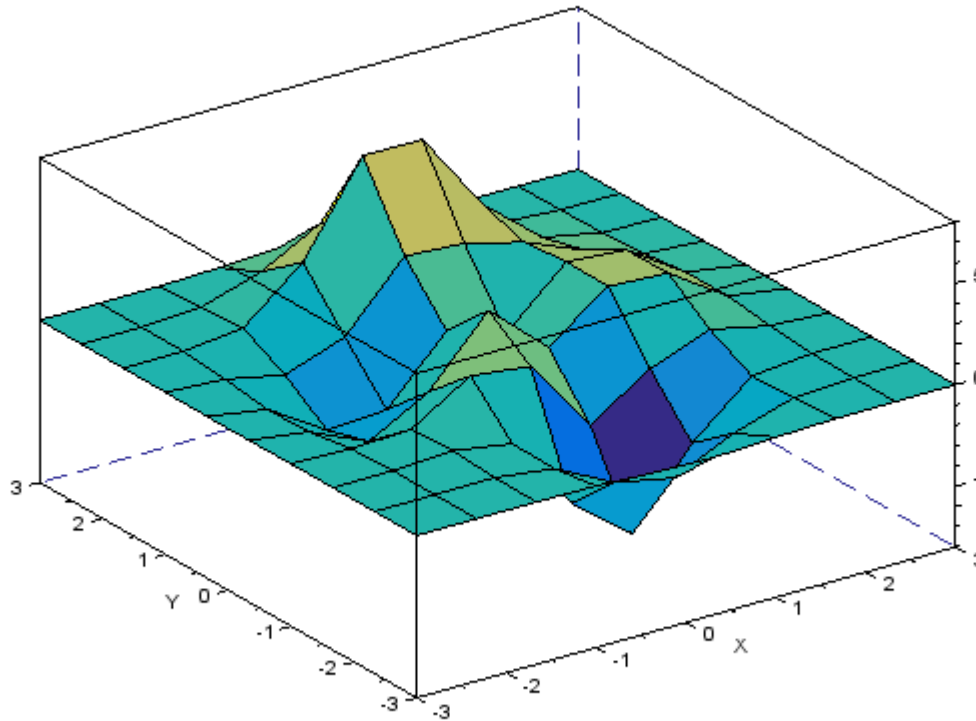
A window titled "Choose your element" with a standard Windows title bar. It features a list box on the left containing the following elements: AL, AL2H6, AL2ME6, ALAS, ALH, ALH2, ALH3, ALME, ALME2, and ALME3. The "AL" element is selected. To the right of the list box is a text field containing the string "eyJ0b2tibiI6IjNiYzY2M2Y:". Below the text field is a "Plot Elements" button.



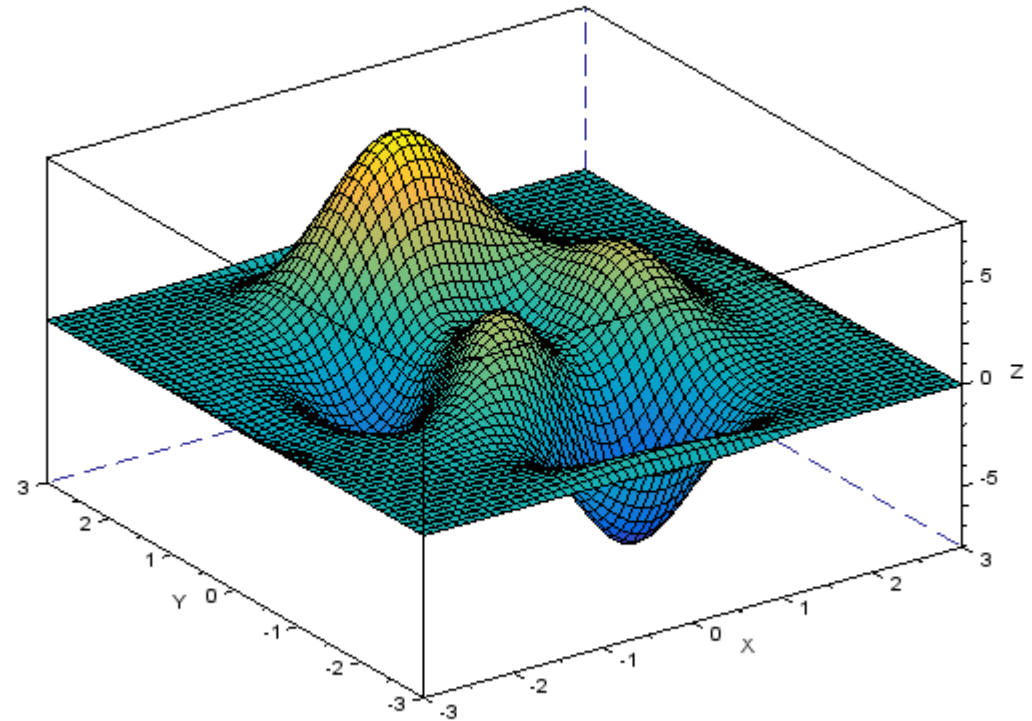
Model Order Reduction Demonstration 3

Model Order Reduction – POD interpolation

`NewPInterp = RBF_interpolation(DOE, IrnPlan, NewParam)`



DOE + IrnPlan



NewParam + NewInterp



Q & A

Mail: scilab@esi-group.com