SIVP

(Scilab **I**mage and **V**ideo **P**rocessing Toolbox)

A Scilab Toolbox based on OpenCV

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June 9, 2006
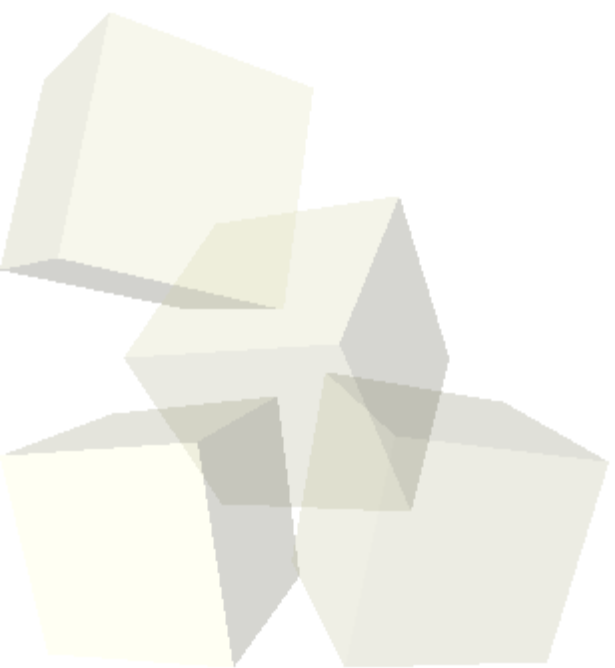
OpenCV China Website

- Everyone can edit the web pages.

- API document, tutorials, examples, slides, ...

- Web forum
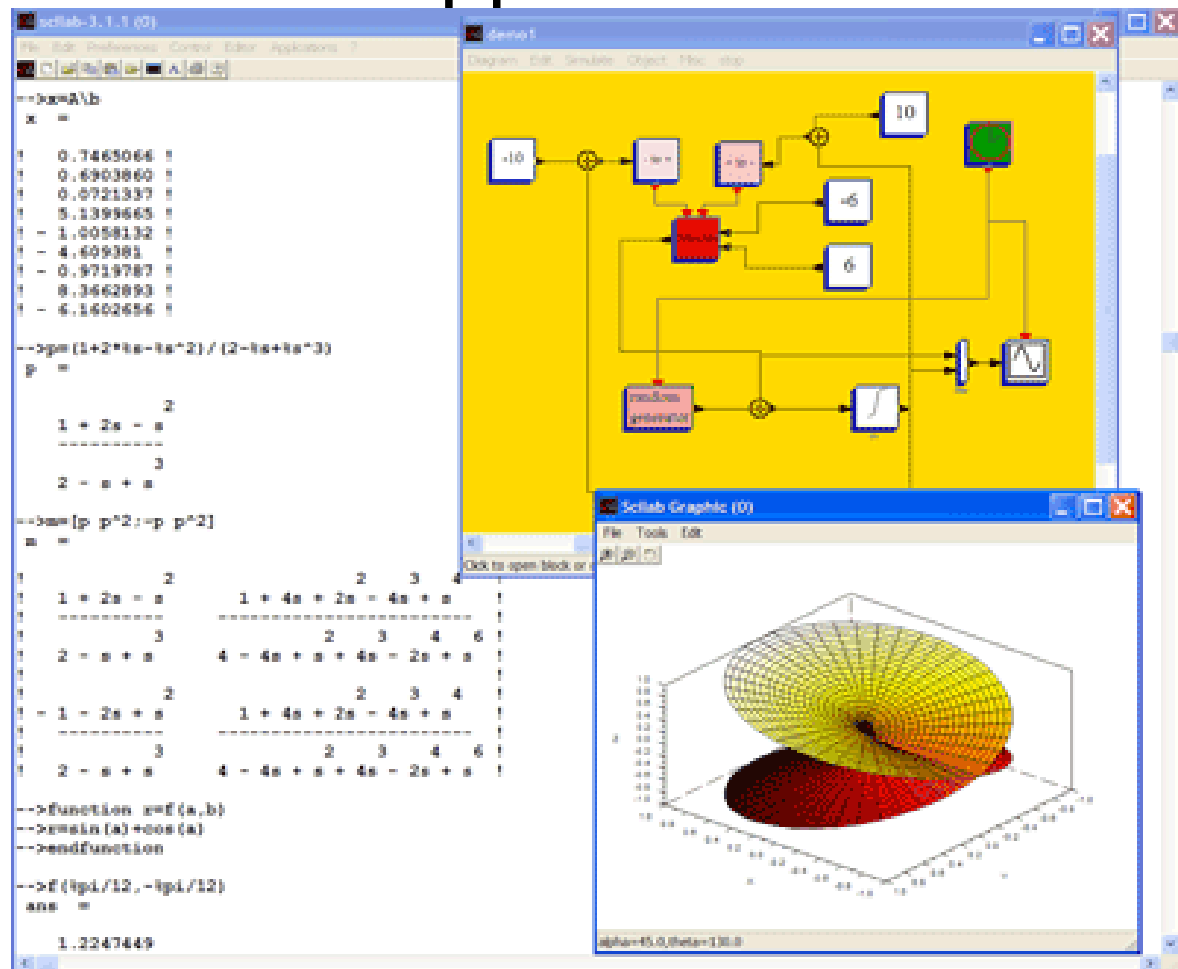
Chinese Doc Improvement Project
（中文文档改善计划）

What's Scilab?

Scilab is a **open source** scientific software package for numerical computations providing a powerful open computing environment for engineering and scientific applications.

Scilab syntax is largely based on the Matlab language.

Scilab code examples:

```
-->m=[1,2,3; 4,5,6]
 m  =

    1.    2.    3.
    4.    5.    6.

-->m(:,2)
 ans  =

    2.
    5.

-->plot(m(:))
```
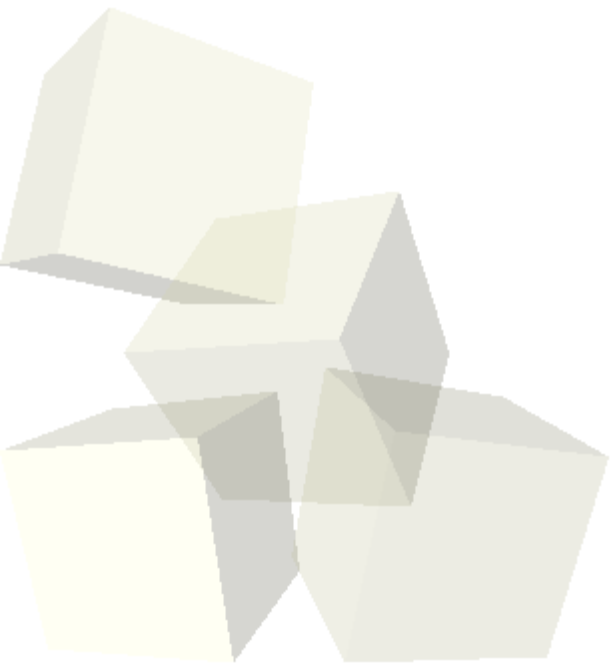
Why to do image processing in Scilab?

It's more convenient for algorithm design using **script languages** than **programming languages** (C/C++).

SIP vs. SIVP

Scilab Image Processing Toolbox (SIP)
http://siptoolbox.sf.net

SIVP is inspirited by SIP, and developed on OpenCV nor ImageMagick as SIP.

SIVP supports video r/w and grabbing frames from cameras.

Most SIVP functions are fast than SIP functions.

SIVP intends to do image processing and video processing tasks. SIVP is meant to be a **useful**, **efficient**, and **free** image and video processing toolbox for Scilab.

- **Useful**: A toolbox must be useful.

- **Efficient**: Efficiency is important for researchers.

- **Free**: The toolbox should be free software and benefits more people. (GPL license)
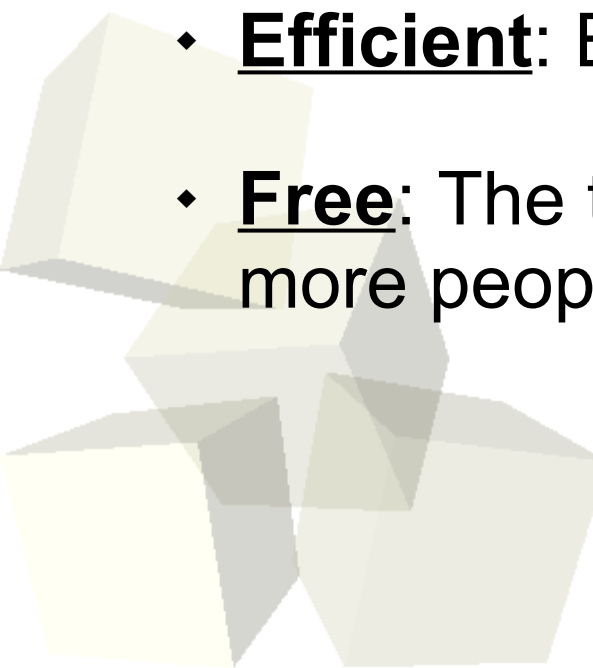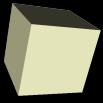
- **Image read, image write**
  - ◆ BMP, PNG, JPEG, TIFF, PBM, PGM, PPM, PBM, PGM, PPM
- **Video file read/write**
- **Video capture for cameras or 1394 devices**
- **Image processing**
  - ◆ edge, filter2, imnoise, imcrop, imhist, imlincomb, imadd, rgb2ntsc, ...
- **Interface**
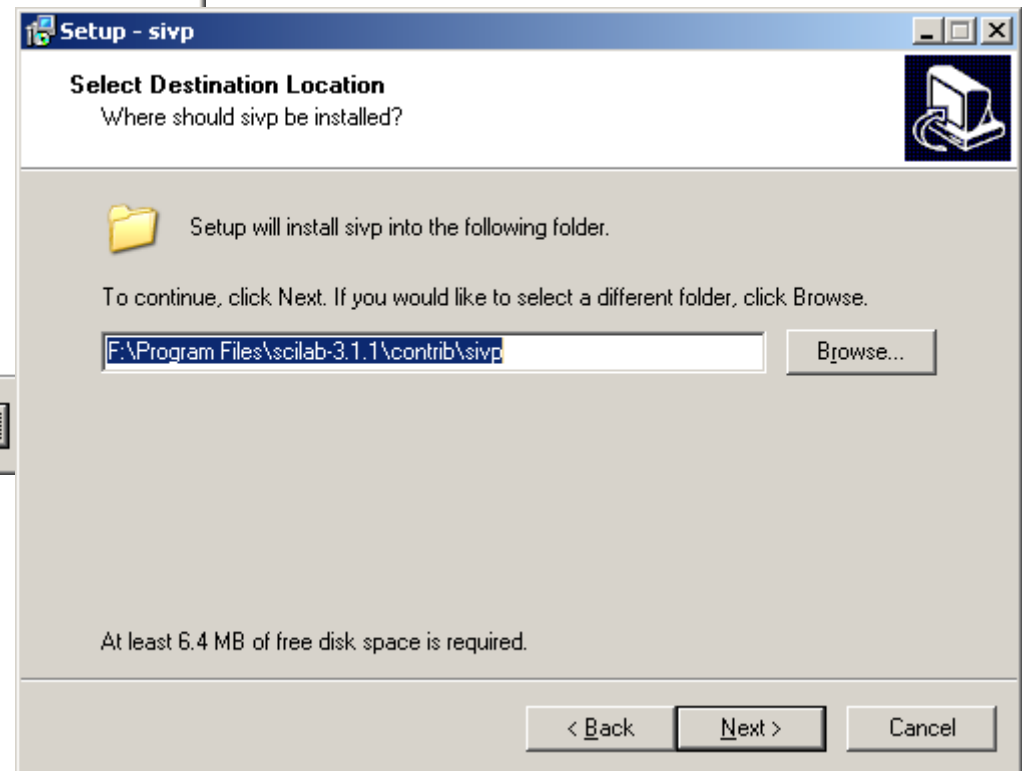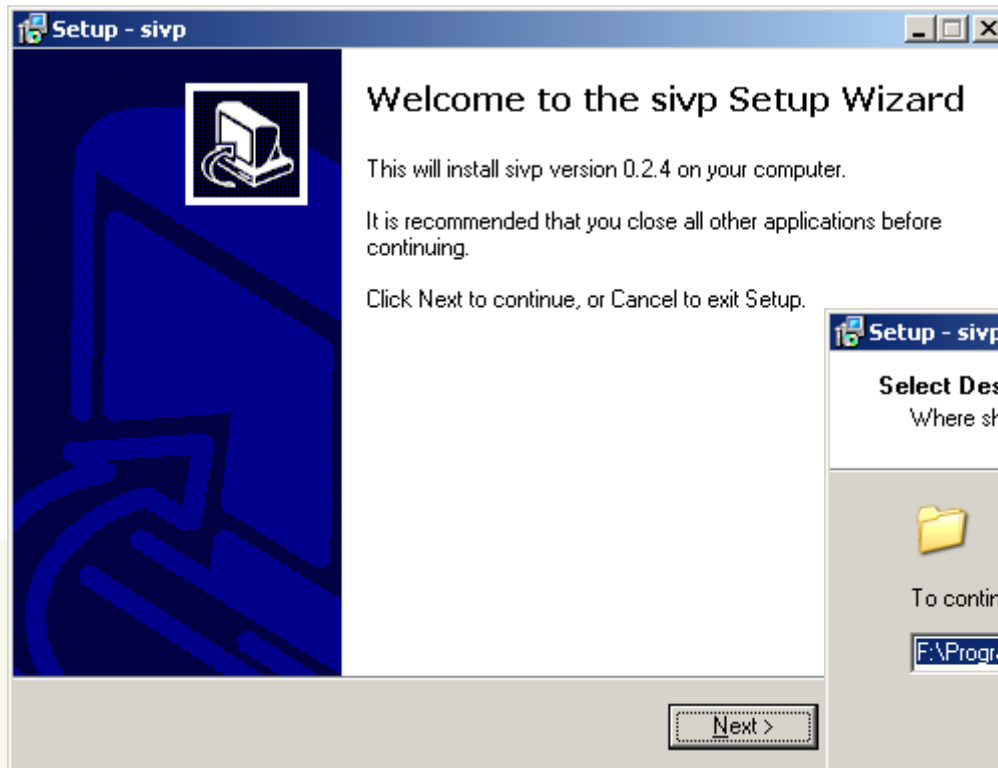 - ◆ image showing
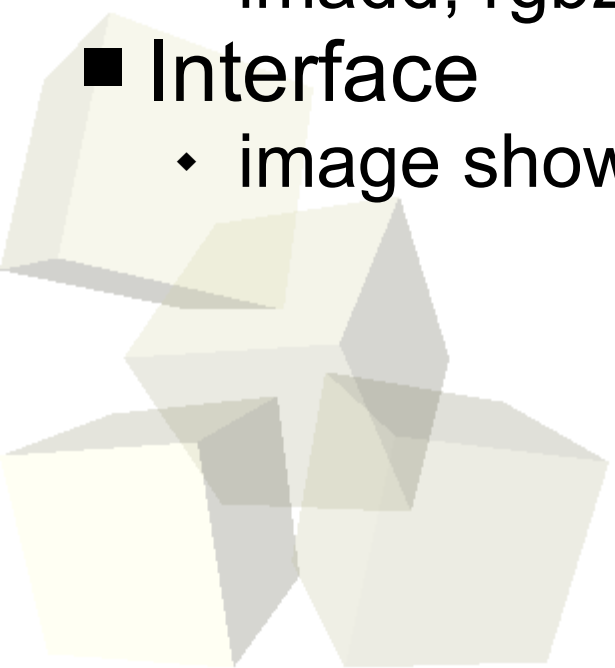
- **Install SIVP under Linux**
  Download the newest source code and then

  - `$tar zxvf sivp-0.4.3.tar.gz #uncompress`

  - `$cd sivp-0.4.3`

  - `$./configure`

  - `$make`

  - `#make install # as root`

- **SIVP will be in Debian depository.**

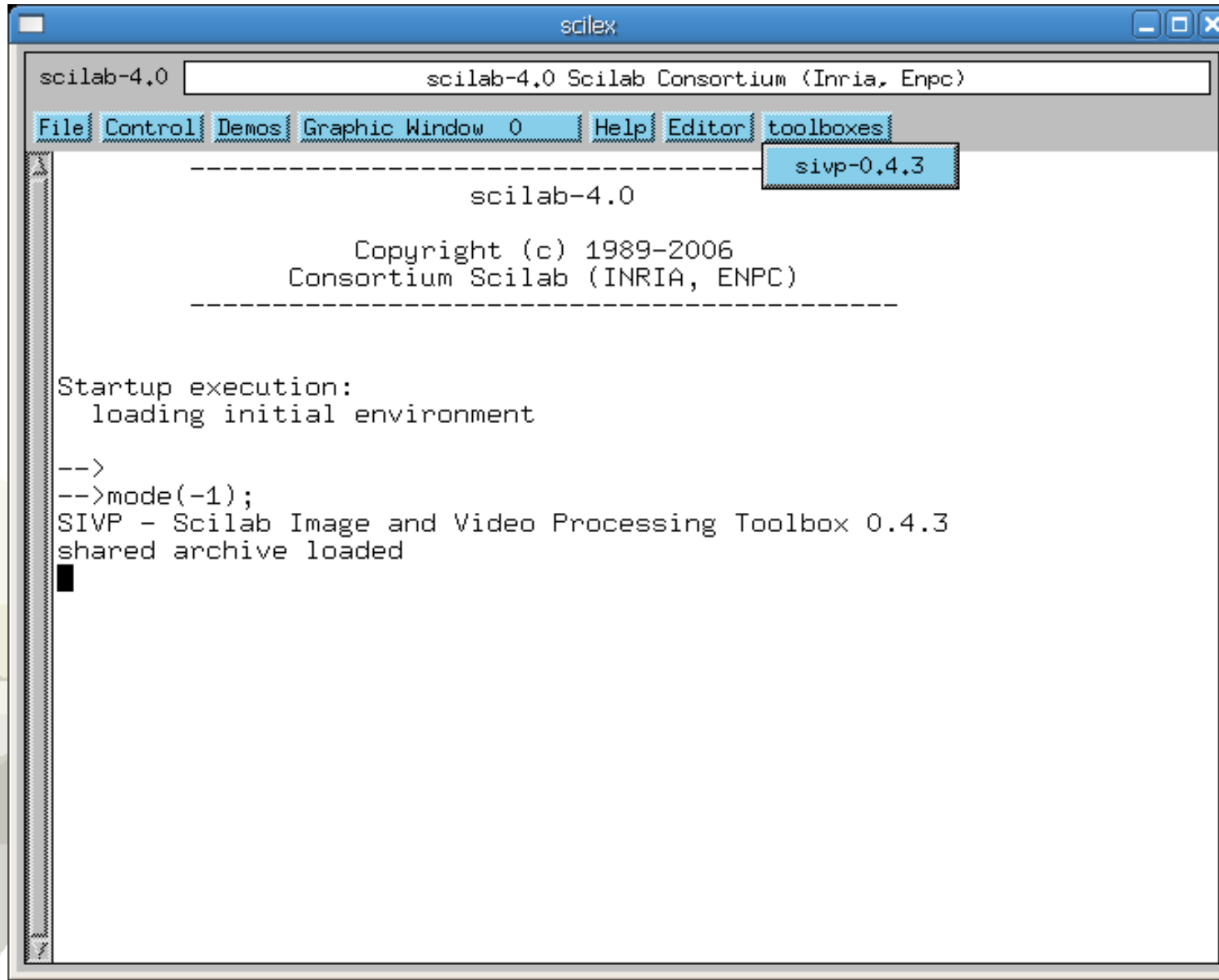## ■ Install SIVP under Windows

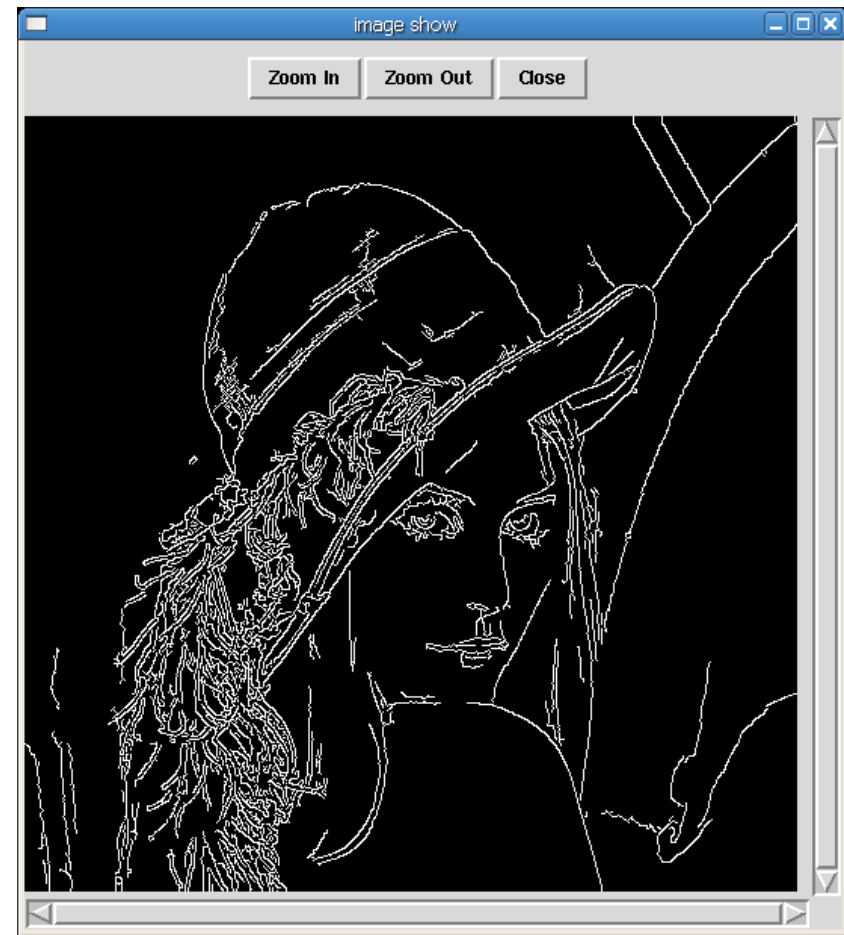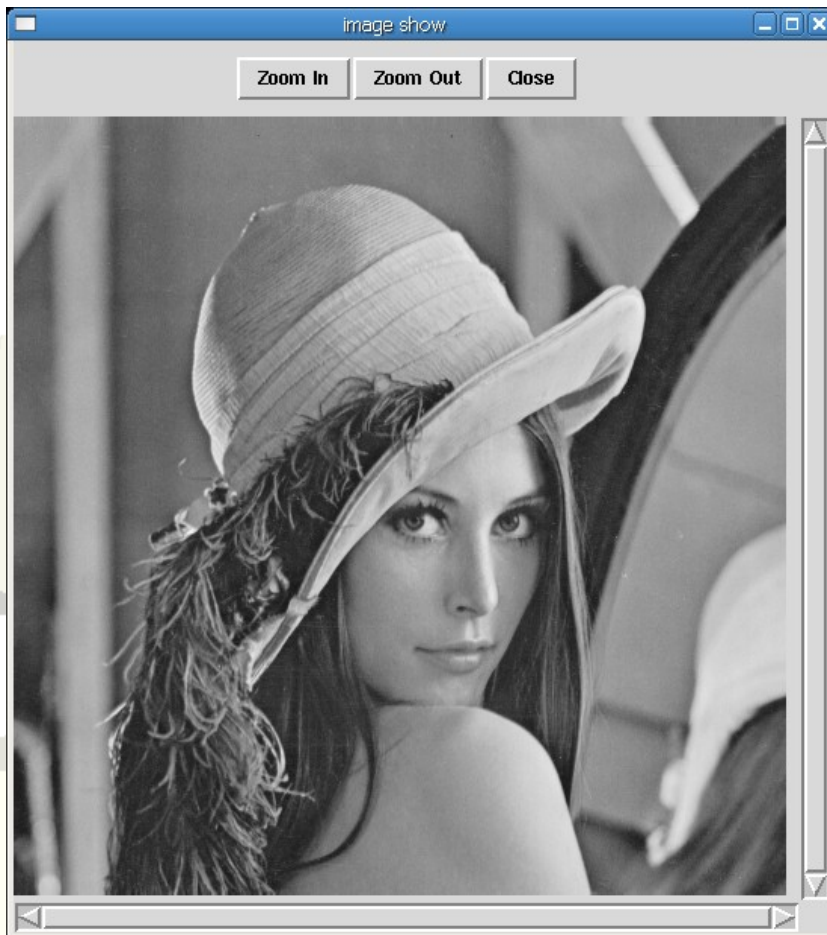We made an friendly installer for Windows version

■ Load SIVP to Scilab

  ◆ SIVP help, demos will appear in the menus

- ## Load, show and process an image

```
-->im=rgb2gray(imread('lena.png'));
-->imshow(im);
-->imc=edge(im, 'canny', [0.06, 0.2]);
-->imshow(imc);
```
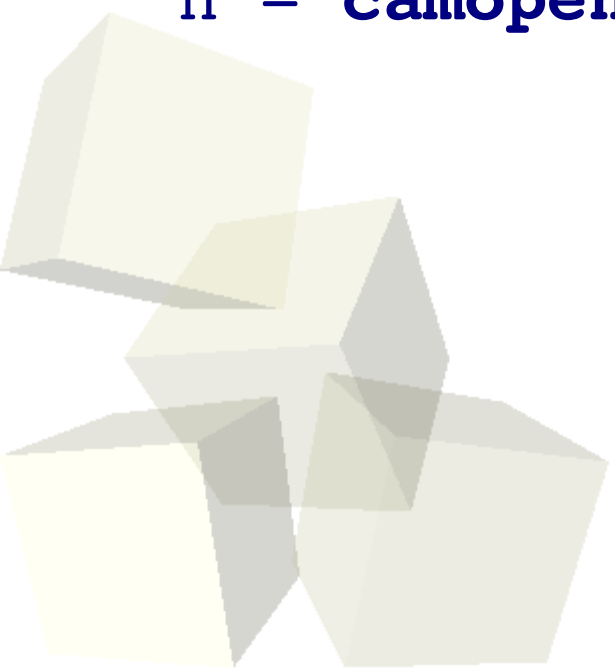
■ Video file/camera read

```
n = aviopen('video.avi');
im = avireadframe(n); //get the 1st frame
im = avireadframe(n); //get the 2nd frame
aviclose(n);


n = camopen(); //to open a camera
```
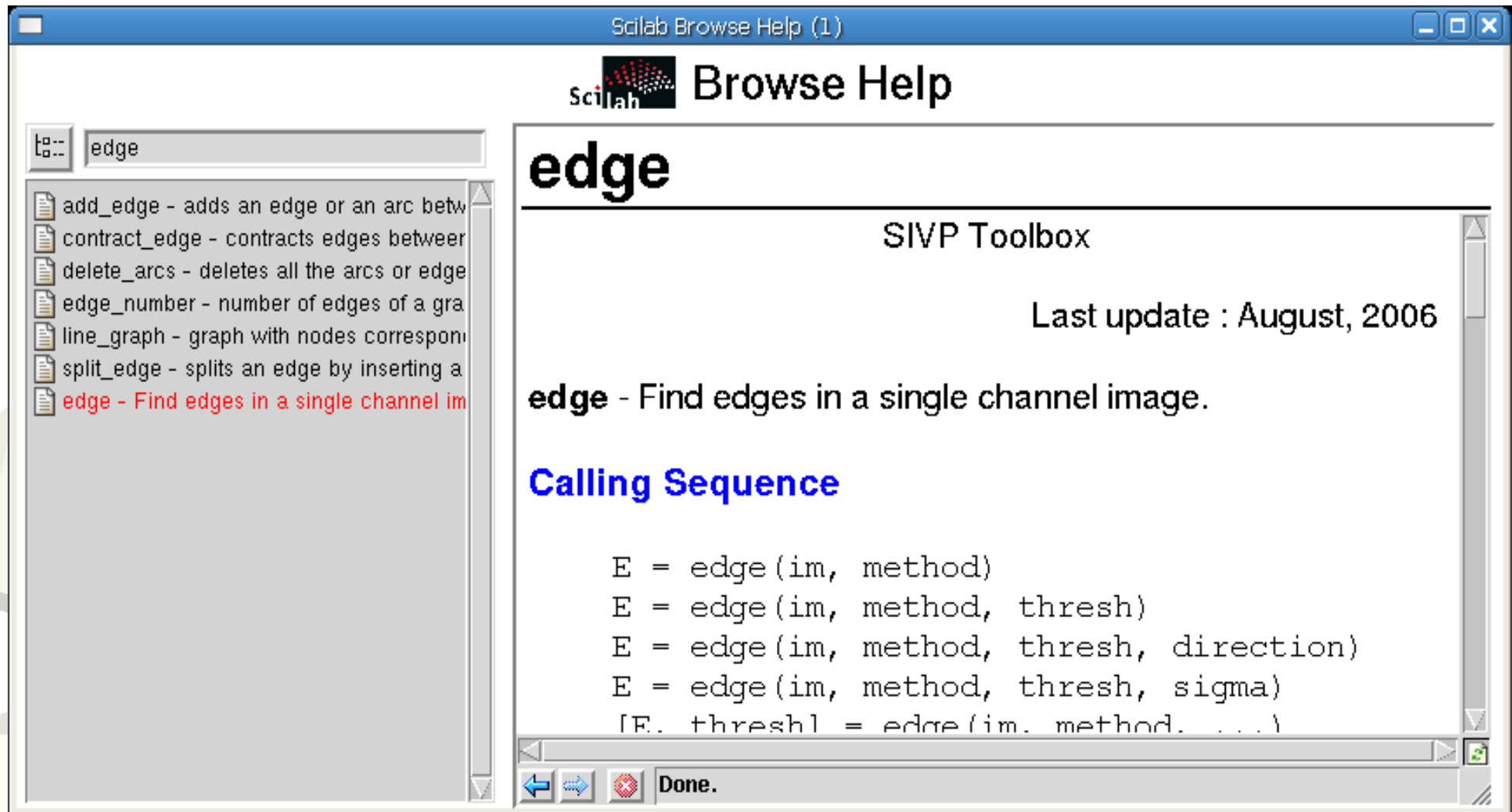
■ Video file write

```
im = imread('lena.png');
n = avifile('lena.avi', [300;300], 30);

for ii=1:200
    ims = im(ii:512-ii, ii:512-ii, :);
    addframe(n, ims);
end

aviclose(n);
```

- ## Get help

```
-->help canny
```

C Interface

```
int intex1c(char *fname)
{
  int i1, i2;
  int ierr;
  int l1, m1, n1, m2, n2, l2, m3, n3, l3, m4,
n4, l4, l5, l6;
  int minlhs=1, minrhs=4, maxlhs=5, maxrhs=4;
  int * data;

  CheckRhs(minrhs,maxrhs) ;
  CheckLhs(minlhs,maxlhs) ;
```
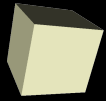
C Interface

```
GetRhsVar(1, "i", &m1, &n1, &l1);
...
int * data = istk(l2); //get data pointer

...

CreateVarFrom(2,"b",&m2,&n2,&l3, &l2);
...

LhsVar(1) = 2; //set output

return 0;
}
```
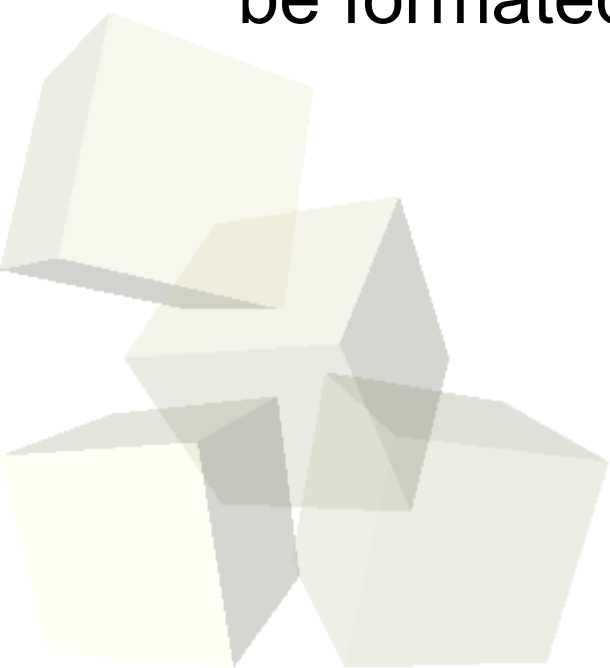
- ■ Macro

```
function [X]=foo1(A)
   X = abs(A);
endfunction
```

- ■ Online Help
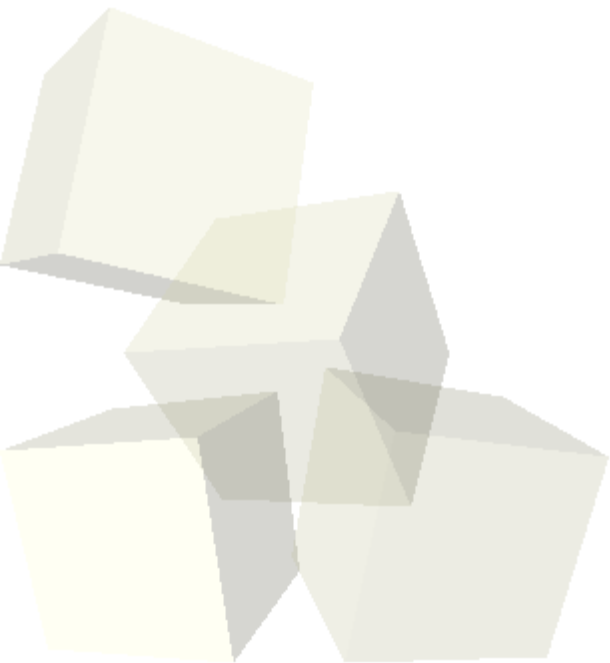 Fomated information is stored in an xml file. The file can be formated to html or other formats.

- **Hardware:**
  - Intel P4 3.0G CPU, 512M RAM

- **Software:**
  - SIP and SIVP: Linux 2.6
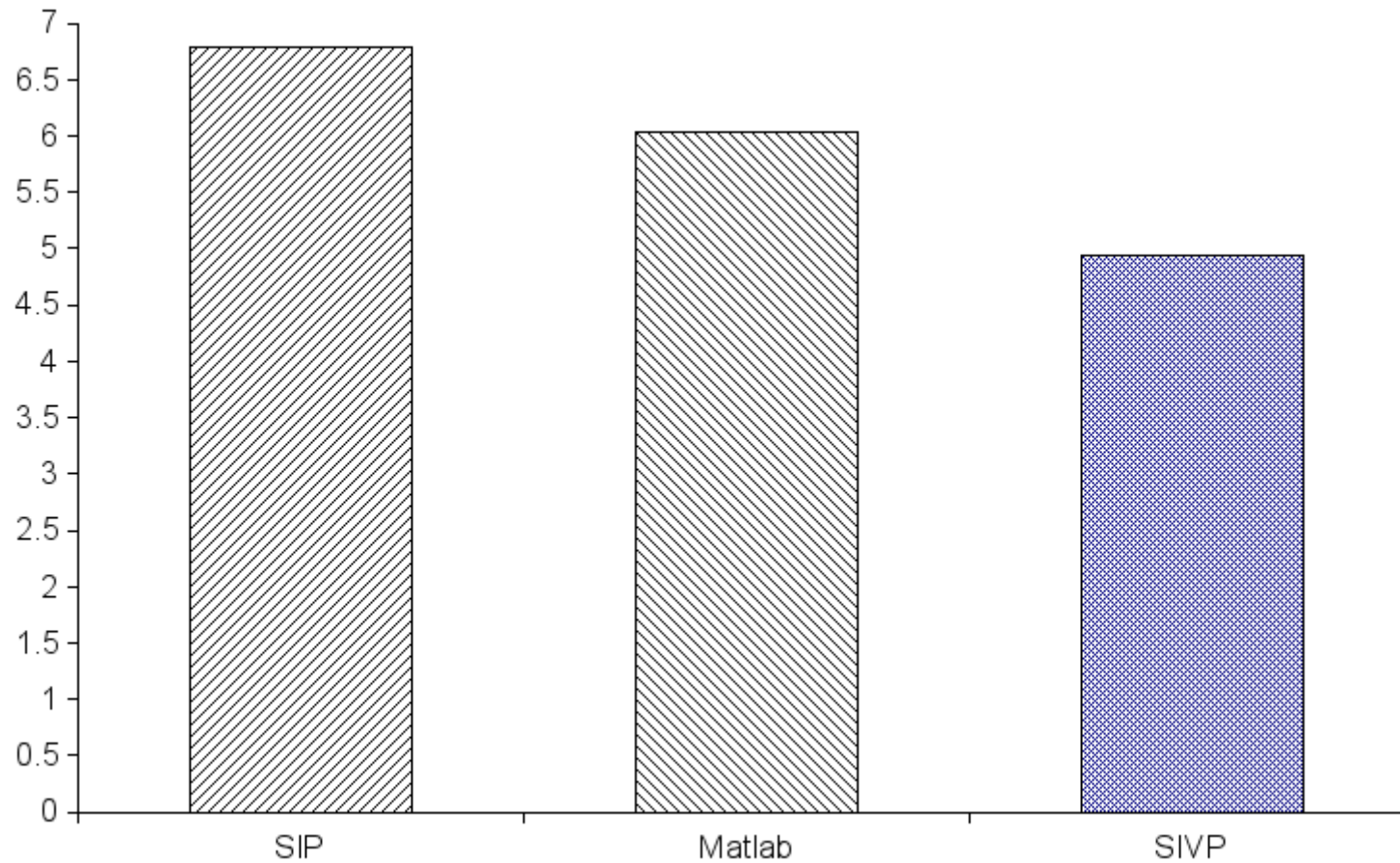 - Matlab: Windows XP

- **True color image reading**
  - The Y dim is the time needed
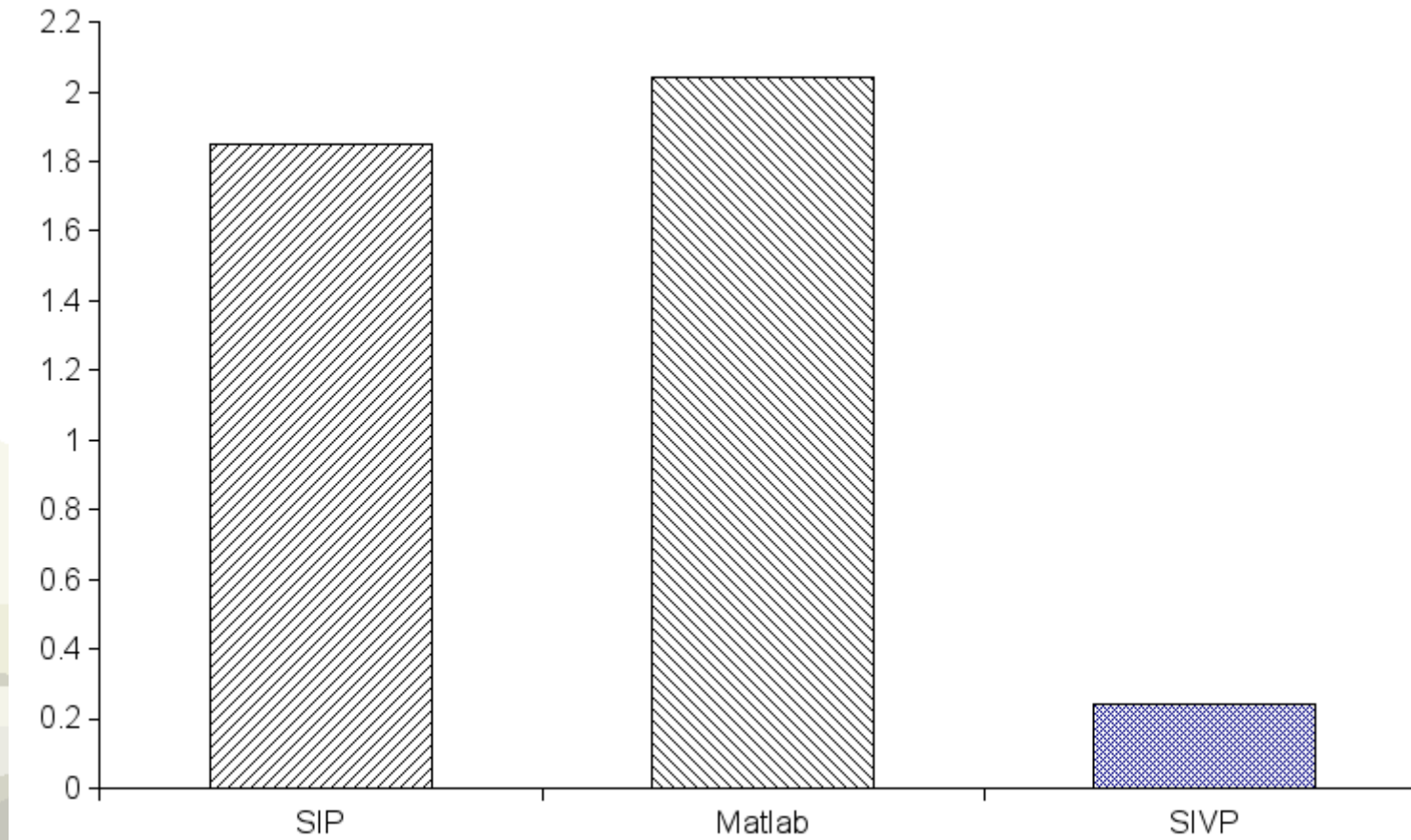
■ **Gray image reading**
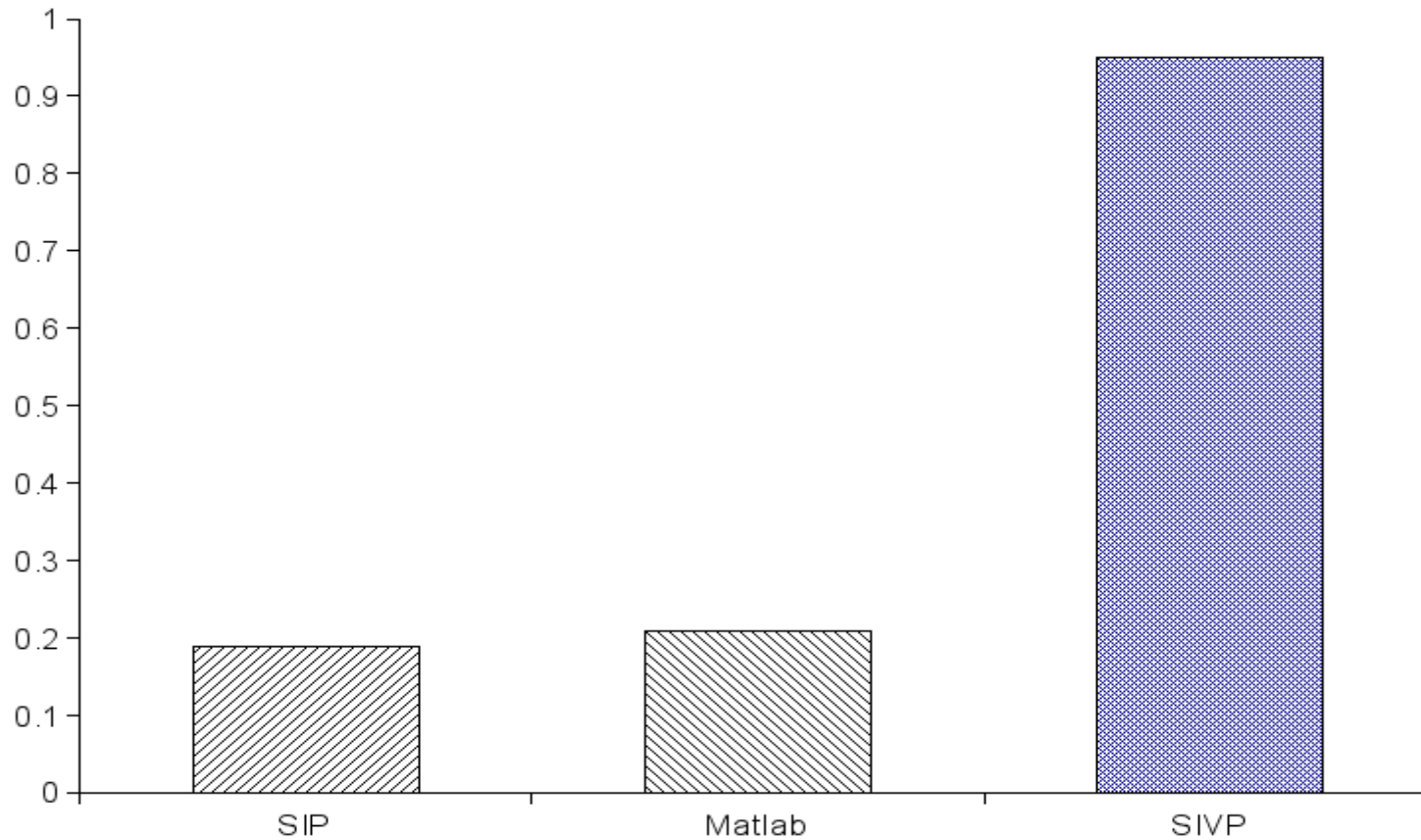
- Sobel operator
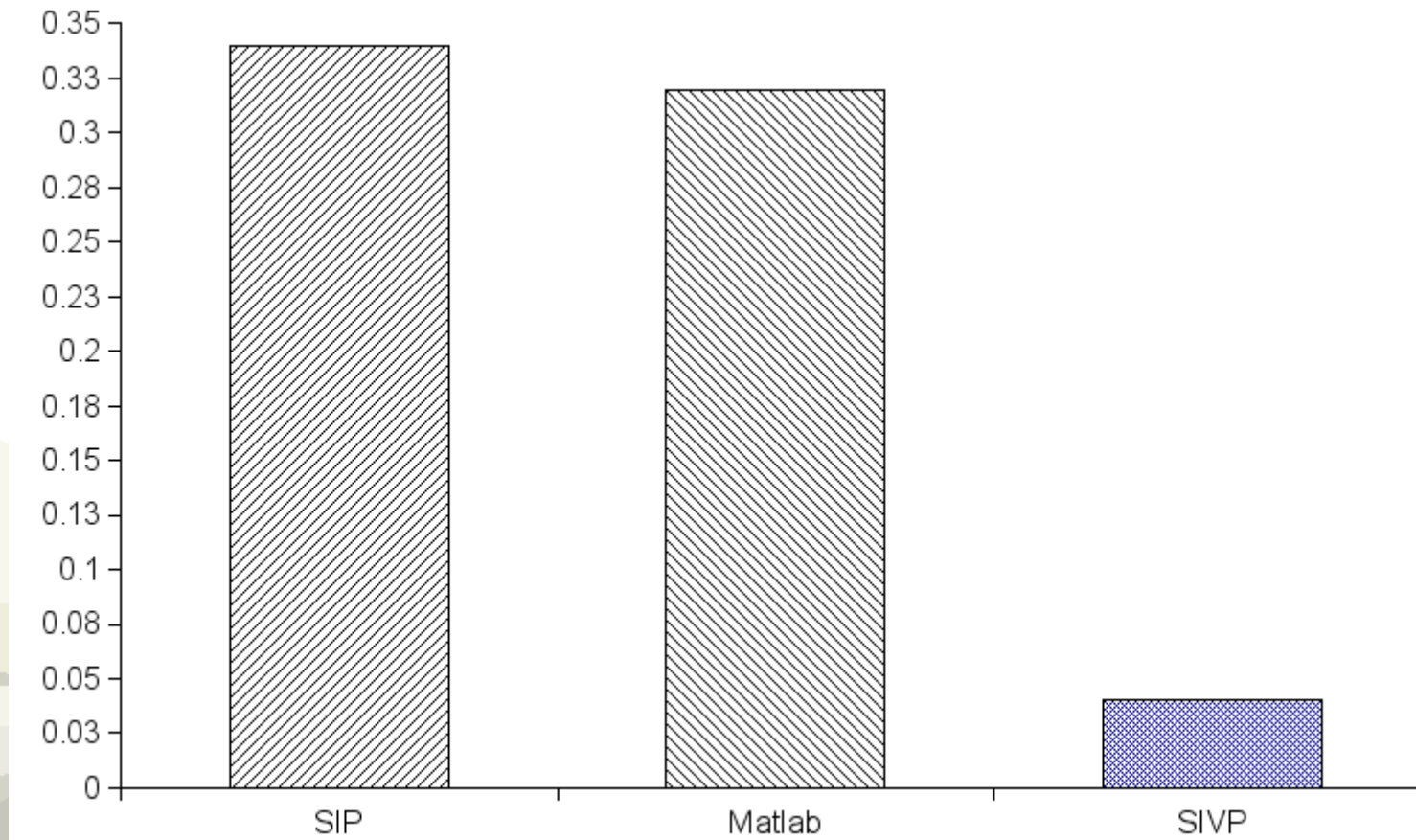
■ Video reading
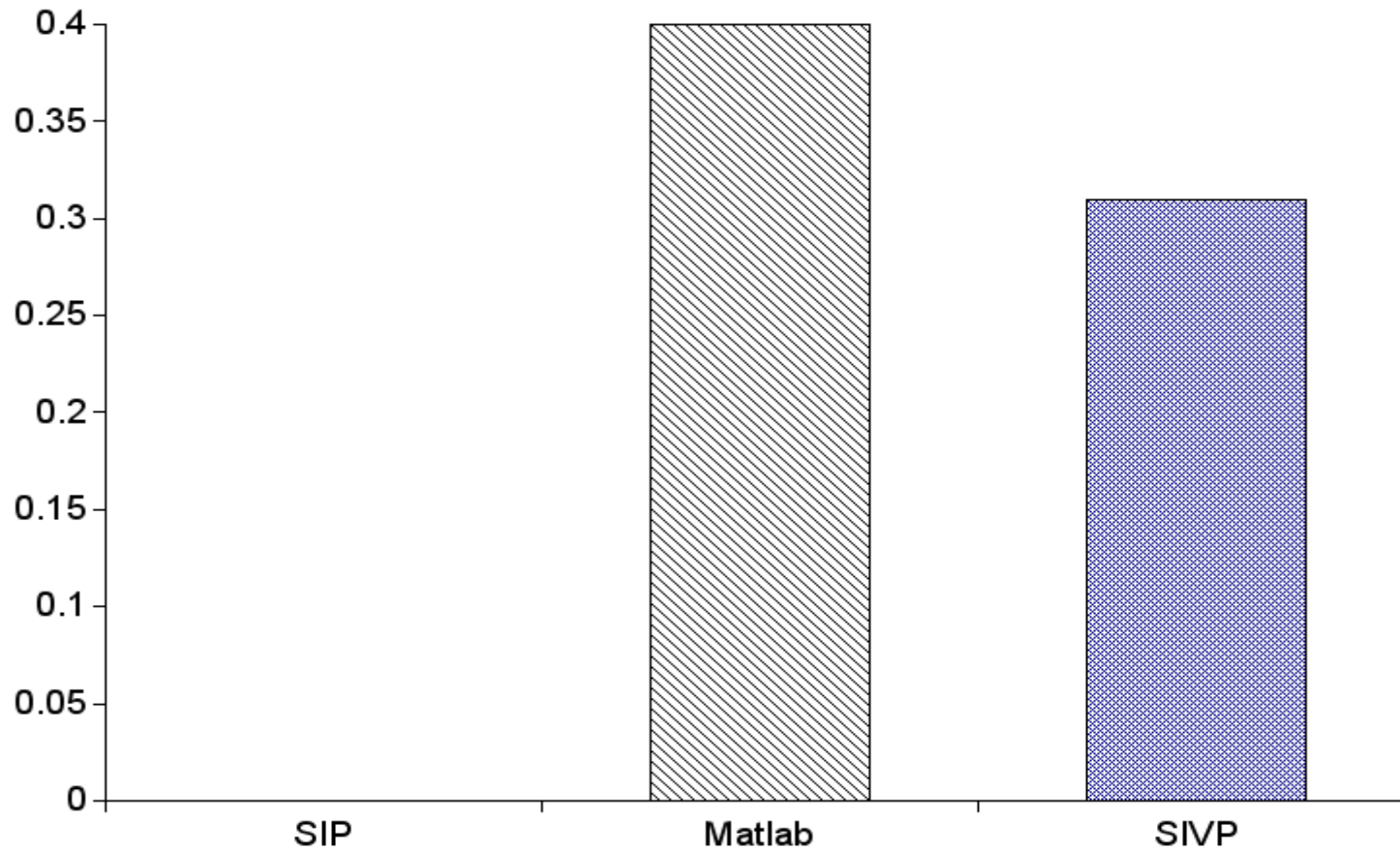
■ True color image showing

If you want to help SIVP, do as follows:

1. Learn and use Scilab;
2. Download and use SIVP (svn version is recommended.)
3. Know how to use **subversion, gcc, make, autoconf, automake.**
4. Read the SIVP source code and modify it.
5. Send email to me. ^-^

Doc writer/Tester: Step 1-2;
Developer: Step 1-5

- Improve image showing function

- More image processing functions

- Fix bugs