

RAFS - Robot Aided Feng Shui

風水

User's Guide

Peter Motykowski-|Bradley White-|J.D. Pohlman-|Matt Allen

Table of Contents

1.0 Introductory Overview	1
2.0 Installation Instructions	2
3.0 Accessing and Starting the Robot	3
4.0 Troubleshooting	6
5.0 Index	7
6.0 Reference	7

1.0 Introductory Overview

The SIUE Robot Aided Feng Shui team has developed this software with the intent that users will utilize it to properly place chairs in the senior project room, EB-2029. While the ActivMedia Pioneer2 robot has many other capabilities, replacing chairs at desks is the main one for which this software has been developed. This software should be used for no other purpose than placing chairs in said room, and contains no warranties either expressed or implied. Use this software at your own risk. The RAFS team, board of trustees of SIUE, Computer Science Faculty and others will not be held liable for any unexpected action the robot may take. This document contains instructions on how to use the robot for the purpose stated above. However, if you wish to learn more about the robot than is provided in this document, feel free to visit <http://robots.activmedia.com> where you can find and download complete manuals on how to use the robot and how all the robot subsystems work. Also for more information and videos of the robot in action please visit <http://rafs.cs.siu.edu>

2.0 Installation Instructions

First, a note about required hardware: To run programs on a robot, you will need an Internet capable personal computer. The computers located in the SIUE School of Engineering computer laboratories will work nicely. Home computer use is discouraged as the distances across the network cause a great deal of latency and can make stable connections impossible. With these facts in mind, use the robot **ONLY** while on campus.

The RAFS project operates the robot from the SIUE Sun server (solar.cs.siue.edu); therefore no robot control software is needed (on your local computer). However, to connect to solar you will need the program vncviewer. This program is available for free. Set your web browser to <http://solar.cs.siue.edu> and click on the link to download vncviewer.exe (win32), vncviewer (linux glib2.2). Once downloaded, run the executable (which runs in the same manner as other executable binary files). There is no actual program installation; the program can run on its own.

3.0 Accessing and Starting the Robot

Connecting to a Pioneer 2 Mobile Robot

Step 1

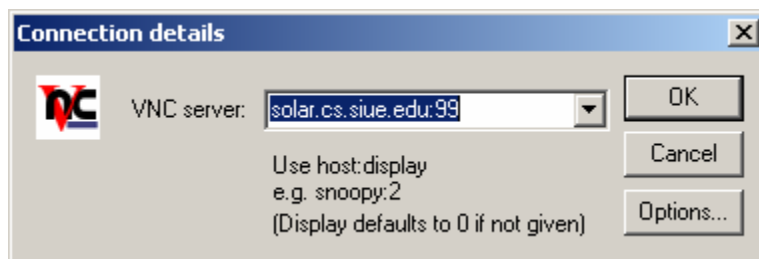
Before using or connecting to a robot, you must have a user id and password for the robot and solar. To obtain these items, please contact a school of engineering robot administrator.

Step 2

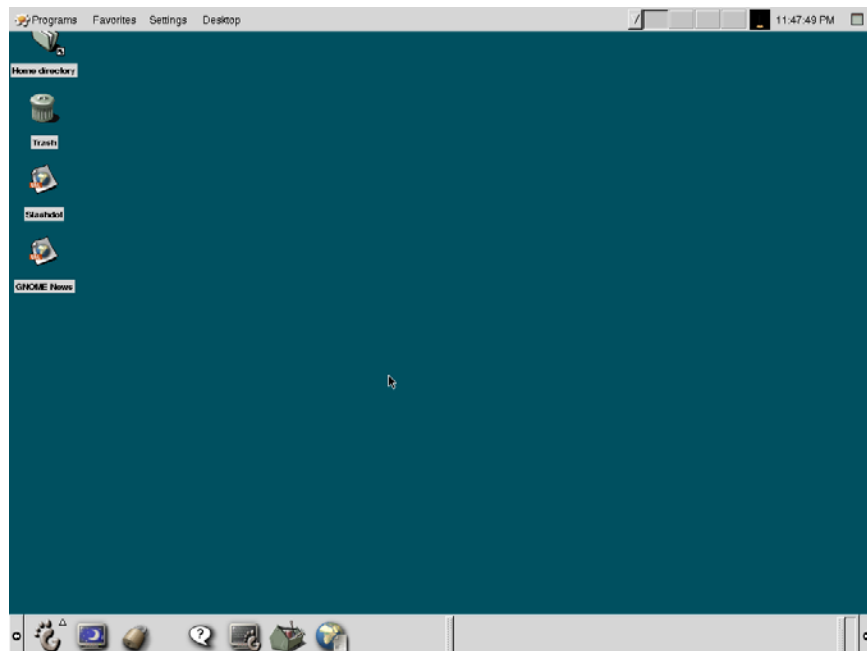
Once you have obtained a user id and password, you will need to download one program. To get the two programs, point your web browser to <http://solar.cs.siu.edu>. Download the files/programs **vncviewer.exe**. Store it in a location where it will be easily accessed.

Step 3

Start the vncviewer program and when prompted for a server the following:



This action will log you into a Unix GUI client. You will then be prompted for your solar username and password. If successful you will see the following:



Step 4

Now, click on the terminal icon (the computer screen with a foot in front of it, third icon from the left). A new terminal window will appear. At the prompt type “who” and look for your login name. You will then see what port number your session is on.

```
motykowp dtremote Nov 5 16:03 (solar:11)
```

Step 5

You are now almost ready to connect to a robot. At the terminal prompt type:

```
xhost + speedybot.soe.siu.edu
```

Step 6

Now, at the terminal window type:

```
ssh speedybot.soe.siu.edu.
```

You will then once again be prompted for your password. Once the following prompt comes up on the terminal window: [**<user-id>@speedybot <user-id>**] type the following:

```
export DISPLAY=solar.cs.siu.edu:<port-number>
```

Step 7

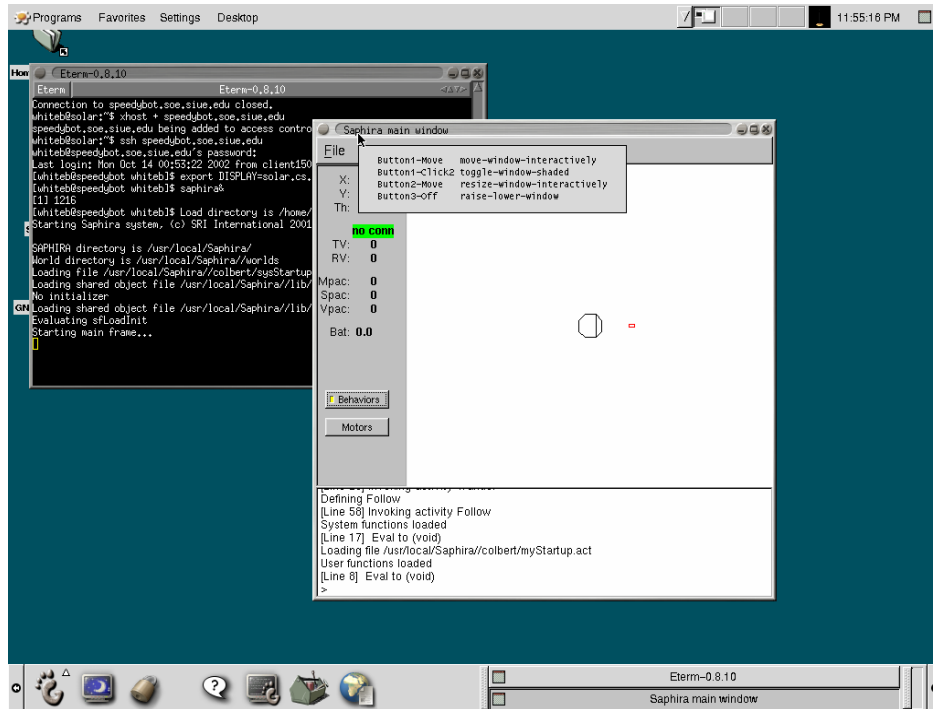
Type the following at the command prompt:

```
sudo acts -c rafs
```

The “-c” is for a predefined configuration file. You will then have to enter your password.

Step 8

Now you can start the Saphira client. At the command prompt, go to the rafsDriver folder, then type rafsDriver to load all appropriate libraries and to start Saphira. After you have executed the last statement, you will see a screen like the following:



Step 9

To disconnect from the robot, first click the **Connect**, **Disconnect** options from the Saphira window and then **File**, **Exit**. Second, exit out of all open terminals by typing exit. You have now closed all console windows and connections to the robot

Step 10

Click on the foot in the lower left hand corner, and select the Log Out option. Once you have done these steps you will have successfully logged out of all servers and robots.

4.0 Troubleshooting

While using the robot you may encounter some common problems. The first is that the robot may get stuck on the wire covers on the floor of room EB-2029. **DO NOT** lift the robot off of the floor. This will give erroneous readings for the robot's map and laser and may cause collisions of chairs to take place. Instead, give the robot a gentle push in the direction it is attempting to move. **DO NOT** push directly on the robot's bumpers, rather give the robot a gentle push on the chassis. Second, the robot's electric motors may stall while trying to turn with a chair. If this happens, do not panic. The robot will try to keep turning until it once again gets traction. If the robot can get no

traction, give it a gentle push in the direction it is trying to turn. Once again **DO NOT** push directly on the bumpers. Lastly for some lighting has been a concern for when the robot is in operation. For best effectiveness, the robot works best with the room lights **ON**, and the dimmer set to a level of 70-80%.

Troubleshooting Summary

- **DO NOT lift Robot off of floor; give a gentle push to the robot.**
- **DO NOT push directly on the robot's rear bumper, push on the chassis instead.**
- **DO NOT panic if the motors stall, wait before taking action.**
- **If robot locks up, hit the red reset button on the chassis and reconnect, kill all sessions and reconnect.**

5.0 Index

ACTS, addendum, 5

connecting, 3

disconnecting, 5

library, 5

Saphira, 4

troubleshooting, 6

vncviewer, 2

6.0 Relevant References

<http://rafs.cs.siu.edu>

<http://robots.activmedia.com>

Team Member Email

JD Pohlman: jdpohl@hotmail.com

Brad White: bradwhite_79@hotmail.com

Peter Motykowski (Robot Administrator): pmotyko@siue.edu

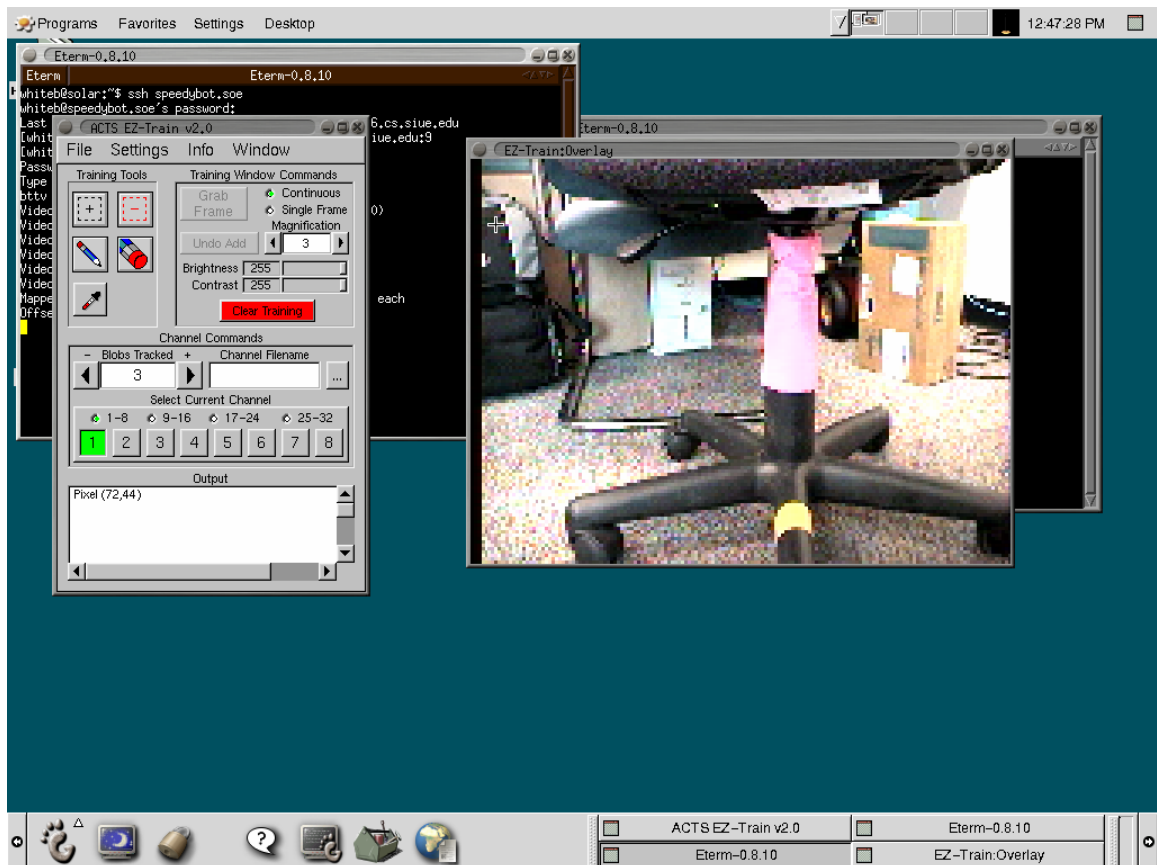
Matt Allen: mallan_1@yahoo.com

Addendum: How to Use ActivMedia ACTS software

Overview:

The ActivMedia Color Tracking Software is used by the RAFS project to recognize chairs. The ACTS software is used exclusively for this purpose for this project. It works by starting up the camera, and then selecting a color on the screen using a lasso-like tool.

- 1.) At the speedybot command prompt, type: sudo acts
- 2.) When prompted type your password as provided by the robot administrator
- 3.) Once the ACTS dialog box opens make sure that the robot is pointed towards a marked chair.
- 4.) Your screen will look like the following:



- 5.) Enlarge the view window by clicking the right arrow key until it reads 2.
- 6.) Once a chair is in sight click on the dashed button on the upper left had of the ACTS dialog. Next drag the cursor over the colored portion of the chair on screen.
- 7.) Once this action is done, the selected color will turn blue on the screen. If you have selected the wrong color, many items on the screen may appear this blue color. If this is the case, repeat the previous action of selecting a color on screen (the pink wrapping on the chair posts).
- 8.) This action is needed to train the robot before each use. Due to varying room conditions, fading of paper, etc., the robot must be trained each time before use.

NOTE: If you are using ACTS just to use the chair placement, type the following at the command prompt: *sudo acts -c rafs*. The “-c” is for a predefined configuration file. Do this **BEFORE** starting the driver file.

Executable Files to run on the Pioneer Robot

/home/rafs/code/rafsDriver/rafsDriver – once logged onto solar and you have a session connected to the robot, navigate to this directory and type “rafsDriver” at the command prompt. There is nothing else you will need to do.