# Unfinished Installation Guide for


# L_SU,
# a graphical user interface
# for Seismic Unix (CSM),
# under Linux

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- **Version: 0.3.9**

# 1 L_SU Installation

## 1.1 Tested operating systems

All the installation steps have been tested on new, blank systems and have worked without any errors and are the recommended simplest paths to installing the software.

Particular users have their own specialized software installations and we would like to hear from you if you have any difficulties with the installation (***gllore@lsu.edu Subject: L_SU***)

We have used the following instructions to install L_SU under several different operating systems -- sometimes with a little apprehension-- but without any ensuing difficulties.

| **Linux operating system** | **Version tested** |
|---|---|
| CentOS | 7.7.1908 |
| Debian | 10 (buster) |
| Ubuntu | 18.04.3 |
| RedHat | 6.9 |

Most installation problems occur (1) if the necessary CPAN modules do not correctly load and (2) if the environment variables are not properly set.

## 1.2 Perl

Before any further installation steps you must first have installed the Perl language on your linux box. Most linux-type systems come automatically with the Perl language. You can check to see if you have Perl installed by entering the following command:

*% perl*

If you install perl as a regular user the process will create "**perl5"**, a sub-directory in your home directory. You will have to accept these modifications. You do not need to do anything. However, you will find several lines of code installed also automatically inside your local "**.bashrc**" file.

Instead, in the following examples, software is installed with superuser permissions (sudo).

# 1.3 Additional Perl freebies

## 1.3.1 Loading cpan

We recommend that the easiest way to install public Perl modules is by FIRST installing a utility that is written in Perl and known as: **cpan**. You will have to have root privileges, at least temporarily when you install **cpan** and the following modules. Later you will be able to use them in L_SU as a regular user. (cpan downloads from ***https://www.cpan.org/***)

If you are working under CentOS7x, I find it easiest to install cpan as follows:

```
% sudo  yum install cpan
```

If you are working under **CentOS8x**, I find it easiest to install cpan as follows:

```
% sudo  dnf install perl-CPAN
```

If you are working under **ubuntu**, I find it easiest to install cpan as follows:

```
% sudo  apt-get upgrade
% sudo cpan -v
```

(Hint: choose to configure **cpan** automatically)

If you are working under **debian**, it is easier to install cpan as follows:

```
% sudo cpan -v
```

To help during cpan installations:

```
% sudo cpan Log::Log4perl
```

## 1.3.2 Loading required libraries

If you are working under **CentOS7x**, and you need help with library requirements,

please e-mail ***gllore@lsu.edu*** for help.

If you are working under **ubuntu**, pre-install the following libraries:

```
% sudo apt-get install dpkg-devsudo apt-get install libx11-dev
% sudo apt-get install libpng-dev libjpeg-dev
```

If you are working under **debian**, I pre-install the following libraries:

```
% sudo  sudo apt-get install dpkg-dev% sudo apt-get install libx11-dev
% sudo apt-get install libpng-dev libjpeg-dev
```

### 1.3.3 Loading required Perl Modules

Continue using **cpan** to install the following required modules:

- *MIME::Base64*
- *Shell*
- *Tk*
- *Tk::JFileDialog*
- *Clone*
- *Tk::Pod*
- *Moose*

For each of the above packages use the following commands to install each of them:

Under **CentOS 7**

```
% sudo  cpan MIME::Base64
% sudo cpan Shell
% sudo cpan Tk
% sudo cpan Tk::JFileDialog
% sudo cpan Clone
% sudo cpan Tk::Pod
% sudo cpan Moose
```

Under **debian**

```
%sudo cpan Tk                    (e.g., 804.034)
%sudo cpan MIME::Base64          (e.g., 3.15)
%sudo cpan Config::Simple         (e.g., 4.58 installed)
%sudo cpan Shell                 (e.g., 0.73 installed)
%sudo cpan Clone                 (e.g., 0.43 installed)
%sudo cpan Tk::JFileDialog       (e.g., 2.20 installed)
%sudo cpan Tk::Pod               (.9943 installed)
%sudo cpan Moose                 (installed 2.2012)
```

To install **evince**, a viewer for postscript files, although it may already be present:

*%sudo apt-get install evince*

Under **ubuntu:**

To help during **cpan** installations:

*% sudo cpan Log::Log4perl*

Then, continue to install the following:

*%sudo cpan Tk (e.g., V804.034 installed)*
*%sudo cpan MIME::Base64 (e.g., V3.15 installed)*
*%sudo cpan Config::Simple (e.g., V4.58 installed )*
*%sudo cpan Shell (e.g., V0.73 installed)*
*%sudo cpan Clone (e.g., V0.43 installed)*
*%sudo cpan Tk::JFileDialog (e.g., V2.20 installed)*
*%sudo cpan Tk::Pod (e.g., V2.9943 installed)*
*%sudo cpan Moose (e.g., V2.2012 installed)*

To install **evince**, a viewer for postscript files, although it may already be present:

*%sudo apt-get install evince*

To help when building Perl Modules, install the following:

*%sudo cpan Module::Build (e.g., V0.4229 installed)*
*%sudo cpan TAP:Harness (e.g., V3.42 installed)*

The following packages have been tested under the following operating systems

| **OS**<br><br>**Package** | **Ubuntu (18.x)** | **Versions tested under Debian 9.9** | **Versions tested under CentOS7x** | **CentOS8** |
|---|---|---|---|---|
| MIME::Base64 | 3.15 | | | |
| Perl | 5.26.1 | 5.24.1 | 5.16.3 | |
| Shell | 0.73.1 | 0.73 | 0.73 | |
| Tk::JFileDialog | 2.20? | 1.62 | 1.62 | |
| Tk or PerlTk | 804.034 | 804.033 | 804.034 | |
| Tk::Pod | 5.41 | 5.41 | 5.41 | |
| Moose | 2.18 | 2.187 | 2.2010 | |
| Clone | 0.41 | 0.38 | 0.39 | |

**cpan** will find dependencies for the above packages and install them as well, so you may see a lot of additional packages installed during the process.

### 1.3.4 Loading Seismic Unix from github (all OS's)

At present, we recommend that you download Seismic Unix and install the program as per the git hub site set up by John Stockwell at: ***https://github.com/JohnWStockwellJr/SeisUnix***

If you are familiar with the program **git** (must be installed on your OS), the following is an example of my installation procedure, contained within a shell-script file. To run this file from the command line using administrative privileges as **sudo**)

```
#!/bin/bash

installation_directory_for_SU=/usr/local/cwp_su_all_44R16
cd $installation_directory_for_SU
git clone https://github.com/gllore/L_SU.git
git status
```

### 1.3.5 Loading L_SU from github (all OS's)

For the following commands to take effect you must have administrator privileges. The installation location in this example lies within the pl directory at the following location: /usr/local/pl

```
#!/bin/bash
```

installation_directory_for_L_SU=/usr/local/pl/

```
cd $installation_directory_for_L_SU
git clone https://github.com/gllore/L_SU.git
git status
```

### 1.3.6 Modify file that defines the system variables of your computer work environment

#### *1.3.6.1 The following applies to ALL linux operating systems*

In order for Perl to find all the programs that it needs at run time, it will look in pre-defined areas of your hard drive. These pre-defined directories, whether known to the user or not, exist on most personal and linux-based operating systems. Your system manager usually adds special file locations as needed. Local users can even override the special file locations although that is not a safe practice.

For example, if I usually place Perl programs under **/usr/local/pl**. Then, in order for all the Perl scripts and other programs to run, I have to add several new lines of instructions within my **.bashrc** file, located in my home directory.

```
# for L_SU-1
# for general perl directories
export LOCAL=/usr/local/pl
export PL=$LOCAL/pl

# for L_SU-2
export L_SU=$PL/L_SU
export PERL5LIB=$L_SU/configs
export PERL5LIB=$PERL5LIB:$L_SU/specs
export PERL5LIB=$PERL5LIB:$L_SU/sunix

for category in data datum plot filter header inversion migration model \
        NMO_Vel_Stk par picks shapeNcut shell statsMath transform \
        well
do
   export PERL5LIB=$PERL5LIB:$L_SU/configs/$category
   export PERL5LIB=$PERL5LIB:$L_SU/specs/$category
   export PERL5LIB=$PERL5LIB:$L_SU/sunix/$category

done

export PERL5LIB=$PERL5LIB:$L_SU/gmt:$L_SU/R:$L_SU/big_streams:$L_SU/messages
export PERL5LIB=$PERL5LIB:$L_SU/misc
export PERL5LIB=$PERL5LIB:$L_SU/reqs:$L_SU/specs:$L_SU/sqlite:$L_SU/streams:$L_SU/geo-
psy:$L_SU/images

# Because therea are exectuable L_SU-related Perl scripts, PATH must be already defined within
# your .bashrc file
# and located somewhere above the current lines, i.e. above "for L_SU-1"
export PATH=$PATH:$L_SU
export PATH=$PATH:$L_SU/big_streams

# for Seismic Unix
export CWPROOT=$LOCAL/cwp_su_all_44R16
```

Please note that **CWPROOT** is a directory path where the C programs that belong to Seismic Unix are usually installed. In this example, this path = /usr/local/pl/cwp_su_all_44R16

If you do not have permission to change your local .bashrc file then ask your systems manager to make some arrangement that will allow your local .bashrc files to pointing to a system-wide file that only the administrator control, in which case you can add the following line to your local .bashrc file:

```
source /PATH/bashrc_system
```

But, you will need to know what 'PATH' is and what 'bashrc_system' is. If this sounds confusing, see your administrator or write to me at ***gllore@lsu.edu***.

#### *1.3.6.2 The following applies to **ubuntu** (18.x)*

Some users experience problems when installing Tk modules. Often this occurs because of missing libraries. For example, some missing libraries such as the following can be installed manually with the following command:

```
sudo apt-get install libx11-dev libfreetype6-dev libxft-dev
sudo apt-get install aptitude libpng-dev libz-dev libjpeg-dev
```

### 1.3.7 Installation of Core L_SU modules for users and developers

All the core Perl programs are available at ***www.github.com/gllore*** and can be installed anywhere you want as long as your operating system knows automatically where they are located (See 1.3.4). If you are reading this file then it means you already know something about downloading files from the github.

In order to download these files from the github site you can run the following program with administrator priviliges:

### 1.3.8 Installation of SioSEIS

From the SIOSEIS Website: " SIOSEIS is a software package for enhancing and manipulating marine seismic reflection and refraction data, sponsored by the National Science Foundation (NSF) and the Scripps Industrial Associates. The system currently runs on Mac OSX (PowerPC and Intel) and PCs (Linux and CYGWIN) E-mail phenkart@gmail.com for inquires. Open source can be downloaded from " http://sioseis.ucsd.edu/index.html"

I recommend you read the documentation at this website for many details on this valuable software.

L_SU integrates some of the functionality of SIOSEIS in order to convert data written in a SEG2 format into SU formatted data.

#### *1.3.8.1 Download SIOSEIS*

You can use your browser to navigate to that website and download the file or you can directly load it into your folder by the following command:

```
% wget http://sioseis.ucsd.edu/src/sioseis-2016.3.1.tar.bz2
```

After you untar and decompact this software read the README file to learn how to install the programs while using root privileges. Later, when L_SU looks for sioseis you should have the path to the binary defined.

#### *1.3.8.2 Modify system environmental variables*

If you use the common bash shell,the **.bashrc** file should contain the following command when **SIOSEIS** is installed under **/usr/local/bin**:

```
export $PATH=$PATH:/usr/local/bin
```

Commonly, bashrc files can contain other general definitions as well to achieve the same result:

```
export LOCAL=/usr/local
export BIN=$LOCAL/bin
export $PATH=$PATH:$BIN
```